

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, DC 20549

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

**INVIVO THERAPEUTICS HOLDINGS CORP.**

(Exact name of registrant as specified in its charter)

Nevada (State or other Jurisdiction of Incorporation or Organization)	3841 (Primary Standard Industrial Classification Code Number)	36-4528166 (I.R.S. Employer Identification No.)
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**One Kendall Square, Suite B14402  
Cambridge, MA 02139  
(617) 863-5500**

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

**Richard Toselli, M.D.  
President and Chief Executive Officer  
InVivo Therapeutics Holdings Corp.  
One Kendall Square, Suite B14402  
Cambridge, MA 02139  
(617) 863-5500**

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

Copy to:

**Rosemary G. Reilly, Esq.  
Wilmer Cutler Pickering Hale and Dorr LLP  
60 State Street  
Boston, Massachusetts 02109  
(617) 526-6000**

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

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

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

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

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

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

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

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

**CALCULATION OF REGISTRATION FEE**

Title of Each Class of Securities to be Registered	Amount to be Registered(1)	Proposed Maximum Offering Price Per Security(2)	Proposed Maximum Aggregate Offering Price(2)	Amount of Registration Fee
Common stock, \$.00001 par value per share, issuable upon exercise of common stock purchase warrants	1,715,240(3)	\$1.48	\$2,538,556	\$330
Common stock, \$.00001 par value per share, issuable upon exercise of placement agent's warrants to purchase common	111,491(4)	\$1.48	\$165,007	\$22

stock

Total	1,826,731	\$2,703,563	\$352
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- (1) Pursuant to Rule 416(a) of the Securities Act of 1933, as amended, or the Securities Act, this Registration Statement also covers any additional shares of common stock that may become issuable to prevent dilution from stock splits, stock dividends and similar events.
- (2) This estimate is made pursuant to Rule 457(c) of the Securities Act solely for purposes of calculating the registration fee. The price per share and aggregate offering price are based upon the average of the high and low prices of the Registrant's common stock on May 20, 2020, as reported on The Nasdaq Capital Market.
- (3) Represents shares of common stock issuable upon the exercise of warrants to purchase common stock at an exercise price of \$1.62 per share issued by the Registrant in a private placement on April 17, 2020.
- (4) Represents shares of common stock issuable upon the exercise of warrants to purchase common stock at an exercise price of \$2.1875 per share issued to designees of the placement agent on April 17, 2020.

**The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until this registration statement shall become effective on such date as the Commission, acting pursuant to said Section 8(a), may determine.**



The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and we are not soliciting offers to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated May 22, 2020

**Preliminary Prospectus**



## **InVivo Therapeutics Holdings Corp.**

### **1,826,731 Shares of Common Stock**

This prospectus relates to the resale by the selling stockholders identified in this prospectus of up to 1,826,731 shares of our common stock that are issuable upon the exercise of certain outstanding warrants, or the warrants, to purchase shares of our common stock, or the warrant shares.

We are not selling any shares of common stock and will not receive any proceeds from the sale of the warrant shares by the selling stockholders under this prospectus. Upon the exercise of the warrants for all 1,826,731 shares of our common stock by payment of cash, however, we will receive aggregate gross proceeds of approximately \$3.0 million.

We have agreed to bear all of the expenses incurred in connection with the registration of these warrant shares. The selling stockholders will pay or assume brokerage commissions and similar charges, if any, incurred for the sale of the warrant shares.

The selling stockholders identified in this prospectus may offer the shares from time to time through public or private transactions at fixed prices, at prevailing market prices, at varying prices determined at the time of sale, or at privately negotiated prices. We provide more information about how the selling stockholders may sell their shares of common stock in the section titled "Plan of Distribution" beginning on page 19 of this prospectus. We will not be paying any underwriting discounts or commissions in connection with any offering of warrant shares under this prospectus.

Our common stock is listed on The Nasdaq Capital Market under the ticker symbol "NVIV." On May 21, 2020, the last reported sale price per share of our common stock was \$1.62 per share.

You should read this prospectus, together with additional information described under the headings "Incorporation of Certain Information by Reference" and "Where You Can Find More Information," carefully before you invest in any of our securities.

**Investing in the offered securities involves a high degree of risk. See "Risk Factors" beginning on page 6 of this prospectus and the section entitled "Risk Factors" included in our [most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q](#), which are incorporated herein by reference, for a discussion of information 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 passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.**

Prospectus dated \_\_\_\_\_, 2020

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## ABOUT THIS PROSPECTUS

The registration statement we filed with the Securities and Exchange Commission (the "SEC") includes exhibits that provide more detail of the matters discussed in this prospectus. You should read this prospectus, the related exhibits filed with the SEC, and the documents incorporated by reference herein before making your investment decision. You should rely only on the information provided in this prospectus and the documents incorporated by reference herein or any amendment thereto. In addition, this prospectus contains summaries of certain provisions contained in some of the documents described herein, but reference is made to the actual documents for complete information. All of the summaries are qualified in their entirety by the actual documents. Copies of some of the documents referred to herein have been filed, will be filed or will be incorporated by reference as exhibits to the registration statement of which this prospectus is a part, and you may obtain copies of those documents as described below under the heading "Where You Can Find Additional Information."

The selling stockholders may from time to time sell up to 1,826,731 shares of common stock, as described in this prospectus, in one or more offerings. This prospectus also covers any shares of common stock that may become issuable as a result of stock splits, stock dividends or similar transactions. We have agreed to pay the expenses incurred in registering these shares, including legal and accounting fees.

We have not, and the selling stockholders have not, authorized anyone to provide any information or to make any representations other than those contained in this prospectus, the documents incorporated by reference herein or in any free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. The information contained in this prospectus, the documents incorporated by reference herein or in any applicable free writing prospectus is current only as of its date, regardless of its time of delivery or any sale of our securities. Our business, financial condition, results of operations and prospects may have changed since that date.

**The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only under circumstances and in jurisdictions where it is lawful to do so. The selling stockholders are not making an offer to sell these securities in any state or jurisdiction where the offer or sale is not permitted.**

All other trademarks, trade names and service marks appearing in this prospectus or the documents incorporated by reference herein are the property of their respective owners. Use or display by us of other parties' trademarks, trade dress or products is not intended to and does not imply a relationship with, or endorsements or sponsorship of, us by the trademark or trade dress owner. Solely for convenience, trademarks, tradenames and service marks referred to in this prospectus appear without the ® and ™ symbols, but those references are not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or that the applicable owner will not assert its rights, to these trademarks and trade names.

## PROSPECTUS SUMMARY

*This summary provides an overview of selected information contained elsewhere or incorporated by reference in this prospectus and does not contain all of the information you should consider before investing in our securities. You should carefully read the prospectus, the information incorporated by reference and the registration statement of which this prospectus is a part in their entirety before investing in our securities, including the information discussed under "Risk Factors" in this prospectus and the documents incorporated by reference and our financial statements and notes thereto that are incorporated by reference in this prospectus. Some of the statements in this prospectus and the documents incorporated by reference herein constitute forward-looking statements that involve risks and uncertainties. See information set forth under the section "Special Note Regarding Forward-Looking Statements." Except where the context otherwise requires, the terms "we," "us," "our," "InVivo" or "the Company" refer to the business of InVivo Therapeutics Holdings Corp., a Nevada corporation, and its wholly-owned subsidiary.*

### **Business Overview**

#### **Overview**

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

The current standard of care for acute management of spinal cord injuries focuses on preventing further injury to the spinal cord. However, the current standard of care does not address repair of the spinal cord.

For additional information regarding our business, see the section entitled "Business" included in our [Annual Report on Form 10-K for the fiscal year ended December 31, 2019](#), as well as the sections entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and the related notes thereto included in our [Annual Report on Form 10-K for the fiscal year ended December 31, 2019](#) and our Quarterly Report on Form 10-Q for the quarter ended March 31, 2020, each of which is incorporated by reference into this prospectus.

#### **Our Clinical Program**

We currently have one clinical development program for the treatment of acute SCI.

Our Neuro-Spinal Scaffold implant is an investigational bioresorbable polymer scaffold that is designed for implantation at the site of injury within a spinal cord. The Neuro-Spinal Scaffold implant is intended to promote appositional, or side-by-side, healing by supporting the surrounding tissue after injury, minimizing expansion of areas of necrosis, and providing a biomaterial substrate for the body's own healing/repair processes following injury. We believe this form of appositional healing may spare white matter, increase neural sprouting, and diminish post-traumatic cyst formation.

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

- Poly lactic-co-glycolic acid, a polymer that is widely used in resorbable sutures and provides the biocompatible support for *Neuro-Spinal Scaffold* implant; and
- Poly-L-Lysine, a positively charged polymer commonly used to coat surfaces in order to promote cellular attachment.

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

#### *INSPIRE 2.0 Study*

Our Neuro-Spinal Scaffold implant has been approved to be studied under our approved Investigational Device Exemption, or IDE, in the INPSIRE 2.0 Study, which is titled the "Randomized, Controlled, Single-blind Study of Probable Benefit of the Neuro-Spinal Scaffold™ for Safety and Neurologic Recovery in Subjects with Complete Thoracic AIS A Spinal Cord Injury as Compared to Standard of Care." The purpose of the INPSIRE 2.0 Study is to assess the overall safety and probable benefit of the Neuro-Spinal Scaffold for the treatment of neurologically complete thoracic traumatic acute SCI. The INPSIRE 2.0 Study is designed to enroll 10 subjects into each of the two study arms, which we refer to as the Scaffold Arm and the Comparator Arm. Patients in the Comparator Arm will receive the standard of care, which is spinal stabilization without dural opening or myelotomy. The INPSIRE 2.0 Study is a single blind study, meaning that the patients and assessors are blinded to treatment assignments. The FDA approved the enrollment of up to 35 patients in this study so that there would be at least 20 evaluable patients (10 in each study arm) at the primary endpoint analysis, accounting for events such as screen failures or deaths that would prevent a patient from reaching the primary endpoint visit. We estimate that enrollment in the INPSIRE 2.0 Study will be complete in the fourth quarter of 2020, with the final patient enrolled in the INPSIRE 2.0 study reaching their six-month primary endpoint visit in the second quarter of 2021.

The primary endpoint is defined as the proportion of patients achieving an improvement of at least one AIS grade at six months post-implantation. Assessments of AIS grade are at hospital discharge, three months, six months, 12 months and 24 months. The definition of study success for INPSIRE 2.0 is that the difference in the proportion of subjects who demonstrate an improvement of at least one grade on AIS assessment at the six-month primary endpoint follow-up visit between the Scaffold Arm and the Comparator Arm must be equal to or greater than 20%. In one example, if 50% of subjects in the Scaffold Arm have an improvement of AIS grade at the six-month primary endpoint and 30% of subjects in the Comparator Arm have an improvement, then the difference in the proportion of subjects who demonstrated an improvement is equal to 20% (50% minus 30% equals 20%) and the definition of study success would be met. In another example, if 40% of subjects in the Scaffold Arm have an improvement of AIS grade at the six-month primary endpoint and 30% of subjects in the Comparator Arm have an improvement, then the difference in the proportion of subjects who demonstrated an improvement is equal to 10% (40% minus 30% equals 10%) and the definition of study success would not be met. Additional endpoints include measurements of changes in NLI, sensory levels and motor scores, bladder, bowel and sexual function, pain, Spinal Cord Independence Measure, and quality of life.

Although The INPSIRE Study is structured with the an Objective Performance Criterion, or OPC, as the primary component for demonstrating probable benefit, the OPC is not the only variable that

the FDA would evaluate when reviewing a future HDE application. Similarly, while our INSPIRE 2.0 Study is structured with a definition of study success requiring a minimum difference between study arms in the proportion of subjects achieving improvement, that success definition is not the only factor that the FDA would evaluate in the future HDE application. Approval is not guaranteed if the OPC is met for our prior clinical trial, The INSPIRE Study, or the definition of study success is met for the INSPIRE 2.0 Study, and even if the OPC or definition of study success are not met, the FDA may approve a medical device if probable benefit is supported by a comprehensive review of all clinical endpoints and preclinical results, as demonstrated by the sponsor's body of evidence.

In 2016, the FDA accepted our proposed HDE modular shell submission and review process for the *Neuro-Spinal Scaffold* implant. The HDE modular shell is comprised of three modules: a preclinical studies module, a manufacturing module, and a clinical data module. As part of its review process, the FDA reviews each module, which are individual sections of the HDE submission, on a rolling basis. Following the submission of each module, the FDA reviews and provides feedback, typically within 90 days, allowing the applicant to receive feedback and potentially resolve any deficiencies during the review process. Upon receipt of all three modules, which constitutes the complete HDE submission, the FDA makes a filing decision that may trigger the review clock for an approval decision. We submitted the first module in March 2017 and received feedback in June 2017. We submitted an updated first module in the fourth quarter of 2019. The HDE submission will not be complete until the manufacturing and clinical modules are also submitted.

### **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 we are continuing the existing business operations of InVivo Therapeutics Corporation as our wholly-owned subsidiary.

Our principal executive offices are located in leased premises at One Kendall Square, Suite B14402, Cambridge, Massachusetts 02139. Our telephone number is (617) 863-5500. We maintain a website at [www.invivotherapeutics.com](http://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.

**THE OFFERING**

<i>Common Stock offered by the Selling Stockholders:</i>	1,826,731 shares.
<i>Use of proceeds</i>	We will not receive any proceeds from the sale of common stock in this offering.
<i>Nasdaq Capital Market symbol</i>	Our common stock is listed on the Nasdaq Capital Market under the symbol "NVIV."

## 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 and uncertainties described below and in the section entitled "Risk Factors" included in our [most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q](#), which are incorporated herein by reference, and other filings we make with the Securities and Exchange Commission, or SEC, from time to time, which are incorporated by reference herein in their entirety, together with the other information in this prospectus and the information incorporated by reference herein and in any free writing prospectus that we may authorize for use in connection with this offering. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could suffer materially. In such event, the trading price of our common stock could decline and you might lose all or part of your investment.*

## SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. These statements include statements made regarding our commercialization strategy, future operations, cash requirements and liquidity, capital requirements, and other statements on our business plans and strategy, financial position, and market trends. In some cases, you can identify forward-looking statements by terms such as "may," "might," "will," "should," "believe," "plan," "intend," "anticipate," "target," "estimate," "expect," and other similar expressions. These forward-looking statements are subject to risks and uncertainties that could cause actual results or events to differ materially from those expressed or implied by the forward-looking statements, including factors such as our ability to raise substantial additional capital to finance our planned operations and to continue as a going concern; our ability to execute our strategy and business plan; our ability to obtain regulatory approvals for our products, including the *Neuro-Spinal Scaffold*; our ability to successfully commercialize our current and future product candidates, including the *Neuro-Spinal Scaffold*; the progress and timing of our development programs; market acceptance of our products; our ability to retain management and other key personnel; our ability to promote, manufacture, and sell our products, either directly or through collaborative and other arrangements with third parties; and other factors detailed under "Risk Factors" in this prospectus and in the section entitled "Risk Factors" included in our [most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q](#), which are incorporated herein by reference, and other filings we make with the SEC from time to time, which are incorporated herein by reference. These forward-looking statements are only predictions, are uncertain, and involve substantial known and unknown risks, uncertainties, and other factors which may cause our actual results, levels of activity, or performance to be materially different from any future results, levels of activity, or performance expressed or implied by these forward-looking statements. Such factors include, among others, the following:

- our limited operating history and history of net losses;
- our ability to raise substantial additional capital to finance our planned operations and to continue as a going concern;
- our ability to complete the INSPIRE 2.0 Study to support our existing Humanitarian Device Exemption application;
- our ability to execute our strategy and business plan;
- our ability to obtain regulatory approvals for our current and future product candidates, including our *Neuro-Spinal Scaffold* implant;
- our ability to successfully commercialize our current and future product candidates, including our *Neuro-Spinal Scaffold* implant;
- the impact of the COVID-19 pandemic on our business;
- the progress and timing of our current and future development programs;
- our ability to successfully open, enroll and complete clinical trials and obtain and maintain regulatory approval of our current and future product candidates;
- our ability to protect and maintain our intellectual property and licensing arrangements;
- our reliance on third parties to conduct testing and clinical trials;
- market acceptance and adoption of our current and future technology and products;

- our ability to promote, manufacture and sell our current and future products, either directly or through collaborative and other arrangements with third parties; and
- our ability to attract and retain key personnel.

We cannot guarantee future results, levels of activity, or performance. You should not place undue reliance on these forward-looking statements, which speak only as of the respective dates as of which they were made. You are cautioned that these forward-looking statements are only predictions and are subject to risks, uncertainties and assumptions that are referenced in the section of this prospectus entitled "Risk Factors." You should also carefully review the risk factors and cautionary statements described in the other documents we file from time to time with the SEC, specifically our most recent Annual Report on Form 10-K, our Quarterly Reports on Form 10-Q and our Current Reports on Form 8-K. Except as required by applicable law, including the securities laws of the United States, we do not intend to update any of the forward-looking statements to conform these statements to reflect actual results, later events or circumstances, or to reflect the occurrence of unanticipated events.

## USE OF PROCEEDS

We are filing the registration statement of which this prospectus forms a part to permit the holders of certain outstanding warrants to purchase shares of our common stock described in the section titled "Selling Stockholders" to resell such shares of common stock issuable upon exercise of such warrants, or the warrant shares.

The selling stockholders will receive all of the net proceeds from sales of the warrant shares sold pursuant to this prospectus and we will not receive any proceeds from the resale of any warrant shares offered by this prospectus by the selling stockholders. However, upon the exercise of the warrants for 1,826,731 shares of our common stock by payment of cash, we will receive aggregate gross proceeds of approximately \$3.0 million. Any proceeds from the exercise of the warrants will be used for working capital, business development activities, and general corporate purposes. We cannot predict when or if the warrants will be exercised, and it is possible that the warrants may expire and never be exercised.

We, and not the selling stockholders, will pay the costs, expenses and fees in connection with the registration and sale of the warrant shares covered by this prospectus, but the selling stockholders will pay all discounts, commissions or brokers' fees or fees of similar securities industry professionals and transfer taxes, if any, attributable to sales of the warrant shares.

**SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT**

The following table sets forth certain information as of April 30, 2020 with respect to the beneficial ownership of our common stock by:

- each person or group of affiliated persons known by us to be the beneficial owner of more than 5% of our common stock;
- each of our directors;
- each of our named executive officers; and
- all of our current executive officers and directors as a group.

Unless otherwise indicated in the footnotes to the following table, each person named in the table has sole voting and investment power, and his or her address is c/o InVivo Therapeutics Holdings Corp., One Kendall Square, Suite B14402, Cambridge, MA 02139. Shares of our common stock subject to options or warrants currently exercisable or exercisable within 60 days of April 30, 2020 are deemed outstanding for computing the share ownership and percentage of the person holding such options and warrants, but are not deemed outstanding for computing the percentage of any other person. The percentage ownership of our common stock of each person or entity named in the following table is based on 4,847,370 shares of our common stock outstanding as of April 30, 2020.

Name of Beneficial Owner	Number of Shares of Common Stock Beneficially Owned	Percentage of Common Stock Beneficially Owned
<b>5% Stockholders</b>		
Entities affiliated with Sabby Volatility Warrant Master Fund, Ltd.(1)	1,394,429	22.3%
Entities affiliated with Armistice Capital Master Fund, Ltd.(2)	1,458,061	24.1%
CVI Investments, Inc.(3)	497,221	9.3%
Intracoastal Capital, LLC(4)	305,715	5.9%
<b>Directors and Named Executive Officers</b>		
Richard Toselli, M.D.(5)	10,072	*
Richard Christopher(6)	9,856	*
C. Ann Merrifield(7)	7,360	*
Richard J. Roberts, Ph.D.(8)	443	*
Daniel R. Marshak, Ph.D.(9)	85	*
Christina Morrison(10)	68	*
Robert J. Rosenthal, Ph.D.(11)	—	—
All current directors and executive officers as a group (7 persons) (12)	27,884	*

\* Percentage of shares beneficially owned does not exceed one percent.

- (1) Consists of 1,394,429 shares of common stock underlying warrants that are exercisable as of April 30, 2020, which are held directly by Sabby Volatility Warrant Master Fund, Ltd. ("SVWMF"). Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit SVWMF to exercise that portion of the warrants that would result in SVWMF and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Hal Mintz is the manager of Sabby Management, LLC, which acts as the investment manager

of SVWMF. As a result, Mr. Mintz may be deemed to beneficially own the securities held by SVWMF. The address of each of SVWMF, Sabby Management LLC and Mr. Mintz is c/o Sabby Management, LLC, 10 Mountainview Road, Suite 205, Upper Saddle River, New Jersey 07458.

- (2) Consists of (a) 254,597 shares of common stock and (b) 1,203,464 shares of common stock underlying warrants that are exercisable as of April 30, 2020, which are held directly by Armistice Capital Master Fund Ltd. ("Armistice Fund"). Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit Armistice Fund to exercise that portion of the warrants that would result in Armistice Fund and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Steven Boyd is the Managing Member of Armistice Capital, LLC, which acts as the investment manager of Armistice Fund. As a result, Mr. Boyd may be deemed to beneficially own the securities held by Armistice Fund. The address of Armistice Fund is c/o dms Corporate Services Ltd., 20 Genesis Close, P.O. Box 314, Grand Cayman KY1-1104, Cayman Islands, and the address of each of Armistice Capital LLC and Mr. Boyd is 510 Madison Avenue, 7th Floor, New York, NY 10022.
- (3) Consists of 497,221 shares of common stock underlying warrants held by CVI Investments, Inc. ("CVI") that are exercisable as of April 30, 2020. Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit CVI to exercise that portion of the warrants that would result in CVI and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Heights Capital Management, Inc. ("Heights"), the authorized agent of CVI, has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of these shares. Martin Kobinger, in his capacity as Investment Manager of Heights, may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any such beneficial ownership of the shares. CVI's address is c/o Heights Capital Management, Inc., 101 California Street, Suite 3250, San Francisco, CA 94111.
- (4) Consists of 305,715 shares of common stock underlying warrants that are exercisable as of April 30, 2020, which are held directly by Intracoastal Capital, LLC ("Intracoastal"). The warrants are subject to a beneficial ownership limitation of 9.99%, which does not permit Intracoastal to exercise that portion of the warrants that would result in Intracoastal and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Mitchell P. Kopin and Daniel B. Asher, each of whom are managers of Intracoastal, have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to beneficially own the securities held by Intracoastal. The address of each of Mr. Kopin and Intracoastal is 245 Palm Trail, Delray Beach, Florida 33483. The address of Mr. Asher is 111 W. Jackson Boulevard, Suite 2000, Chicago, Illinois 60604.
- (5) Consists of (a) 3,769 shares of common stock owned by Dr. Toselli, (b) 317 shares of common stock underlying options held by Dr. Toselli that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date, (c) 3,636 shares of common stock underlying warrants held by Dr. Toselli that are exercisable as of April 30, 2020, (d) 50 shares of restricted stock units granted to Dr. Toselli that will vest within

60 days after April 30, 2020, and (e) 2,300 shares of restricted common stock granted to Dr. Toselli.

- (6) Consists of (a) 3,636 shares of common stock owned by Mr. Christopher, (b) 1,000 shares of common stock underlying options held by Mr. Christopher that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date, (c) 3,636 shares of common stock underlying warrants held by Mr. Christopher that are exercisable as of April 30, 2020, and (d) 1,584 shares of restricted common stock granted to Mr. Christopher.
- (7) Consists of (a) 3,639 shares of common stock owned by Ms. Merrifield, (b) 85 shares of common stock underlying options held by Ms. Merrifield that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date, and (c) 3,636 shares of common stock underlying warrants held by Ms. Merrifield that are exercisable as of April 30, 2020.
- (8) Consists of (a) 290 shares of common stock owned by Dr. Roberts and (b) 153 shares of common stock underlying options held by Dr. Roberts that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date.
- (9) Consists solely of shares of common stock underlying options held by Dr. Marshak that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date.
- (10) Consists solely of shares of common stock underlying options held by Ms. Morrison that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date.
- (11) Mr. Rosenthal does not own any shares of common stock the Company.
- (12) Consists of (a) 11,334 shares of common stock owned by all current executive officers and directors as a group (b) 1,708 shares of common stock underlying options that are exercisable as of April 30, 2020 or will become exercisable within 60 days after such date, (c) 10,908 shares of common stock underlying warrants that are exercisable as of April 30, 2020, (d) 50 shares of restricted stock units that will vest within 60 days after April 30, 2020, and (e) 3,884 shares of restricted common stock.

## DESCRIPTION OF OUR CAPITAL STOCK

### General

The following description of our capital stock is intended as a summary only and therefore is not a complete description of our capital stock. This description is based upon, and is qualified by reference to, applicable provisions of the Nevada Revised Statutes (the "NRS"), our articles of incorporation, as amended, and our amended and restated bylaws and, which are filed as exhibits to the registration statement of which this prospectus forms a part.

### Authorized Capital Stock

Our authorized capital stock consists of 16,666,667 shares of common stock, par value \$0.00001 per share. As of April 30, 2020, 4,847,370 shares of common stock were outstanding. Our common stock is registered under Section 12(b) of the Exchange Act.

### Common Stock

*Voting Rights.* The holders of our 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 our 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.

*Dividends.* Except as provided by law or in our articles of incorporation, the holders of common stock will be entitled to such cash dividends as may be declared from time to time by our board of directors from funds available.

*Liquidation, Dissolution and Winding Up.* Upon liquidation, dissolution or winding up of our 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.

*Other Rights.* 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.

### Provisions of Our Articles of Incorporation and Bylaws and the NRS That May Have Anti-Takeover Effects

#### *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 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 two 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 two 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 of directors, 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. 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.

Our 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, and a stockholder must notify us in writing, within timeframes specified in our bylaws, of any stockholder nomination of a director and of any other business that the stockholders intends to bring at a meeting of stockholders. Our amended and restated bylaws also provide that our bylaws may be amended by our board of directors or by the affirmative vote of at least 80% of our voting stock then outstanding. These provisions could have the effect of discouraging a potential acquirer from making a tender offer or otherwise attempting to obtain control of us because the foregoing provisions may limit the proposals that may be acted upon at a stockholders' meeting, and the amendment provisions in our bylaws make such provisions difficult to change.

#### **Listing on The Nasdaq Capital Market**

Our common stock is listed on the Nasdaq Capital Market under the symbol "NVIV." On May 21, 2020, the reported closing price per share of our common stock on the Nasdaq Capital Market was \$1.62.

#### **Authorized but Unissued Shares**

The authorized but unissued shares of common stock are available for future issuance without stockholder approval, subject to any limitations imposed by the listing requirements of the Nasdaq Capital Market. These additional shares may be used for a variety of corporate finance transactions, acquisitions and employee benefit plans. The existence of authorized but unissued and unreserved common stock could make it more difficult or discourage an attempt to obtain control of us by means of a proxy contest, tender offer, merger or otherwise.

#### **Transfer Agent and Registrar**

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

## SELLING STOCKHOLDERS

On April 15, 2020, we entered into a securities purchase agreement with certain institutional and accredited investors, pursuant to which we agreed to sell and issue, in a registered direct offering offered pursuant to an effective shelf registration statement on Form S-3, an aggregate of 1,715,240 shares of common stock, for aggregate gross proceeds of approximately \$3.0 million, before deducting fees to the placement agents and other offering expenses payable by us.

In a concurrent private placement, pursuant to the purchase agreement, we offered and sold to the investors common stock purchase warrants to purchase an aggregate of 1,715,240 shares of our common stock, or the purchase warrants. The purchase warrants have an exercise price per share equal to \$1.62, are immediately exercisable and expire on October 17, 2025.

Pursuant to a letter agreement dated as of April 15, 2020, or the engagement letter, we engaged H.C. Wainwright & Co., LLC, or Wainwright, to act as the exclusive placement agent in connection with the registered direct and private placement transaction. We issued placement agent warrants to purchase an aggregate of 111,491 shares of our common stock, or the placement agent warrants. The placement agent warrants have an exercise price of \$2.1875 per share, are immediately exercisable and expire April 15, 2025. The shares of common stock underlying the placement agent warrants and the purchase warrants are referred to collectively as the warrant shares.

Pursuant to the securities purchase agreement and the engagement letter, we agreed to file the registration statement of which this prospectus is a part to cover the resale of the shares of common stock underlying the warrants and to keep such registration statement effective until the date that is six months after no selling stockholder owns any warrants.

We are registering the resale of the warrant shares to permit each of the selling stockholders identified below to resell or otherwise dispose of the warrant shares in the manner contemplated under "Plan of Distribution" in this prospectus (as may be supplemented and amended). The term "selling stockholders" includes donees, pledgees, assignees, transferees or other successors-in-interest selling shares received after the date of this prospectus from a selling stockholder as a gift, pledge, partnership distribution or other non-sale related transfer. Throughout this prospectus, when we refer to the shares of our common stock being registered on behalf of the selling stockholders, we are referring to the warrant shares, and when we refer to the selling stockholders in this prospectus, we are referring to the purchasers of the warrants and holders of the placement agent warrants.

The selling stockholders may sell some, all or none of their warrant shares. We do not know how long the selling stockholders will hold the warrant shares before selling them, and we currently have no agreements, arrangements or understandings with the selling stockholders regarding the sale or other disposition of any of the warrant shares. The warrant shares covered hereby may be offered from time to time by the selling stockholders.

The following table sets forth the name of each selling stockholder, the number and percentage of our outstanding shares of common stock beneficially owned by the selling stockholders as of April 30, 2020, the number of warrant shares that may be offered under this prospectus, and the number and percentage of our outstanding shares of common stock beneficially owned by the selling stockholders assuming all of the warrant shares covered hereby are sold. Beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to our common stock. Generally, a person "beneficially owns" shares of our common stock if the person has or shares with others the right to vote those shares or to dispose of them, or if the person has the right to acquire voting or disposition rights within 60 days. The number of shares in the column "Shares of Common Stock being Offered" represents all of the warrant shares that a selling stockholder may offer and sell from time to time under this prospectus.

All information contained in the table below and the footnotes thereto is based upon information provided to us by the selling stockholders. The selling stockholders may have sold or transferred, in

transactions exempt from the registration requirements of the Securities Act, some or all of their warrant shares or other securities since the date on which the information in the table below is presented. Information about the selling stockholders may change over time. The percentage of shares owned after the offering is based on 4,847,370 shares of common stock outstanding as of April 30, 2020.

<u>Name</u>	<u>Shares of Common Stock Beneficially Owned Prior to this Offering</u>	<u>Shares of Common Stock Offered Hereby</u>	<u>Beneficial Ownership After this Offering(1)</u>	
			<u>Number of Shares</u>	<u>%</u>
Intracoastal Capital, LLC(2)	305,715	305,715	—	—
CVI Investments, Inc.(3)	497,221	457,143	40,078	*
Entities affiliated with Armistice Capital Master Fund Ltd.(4)	1,458,061	476,191	981,870	17.6
Entities affiliated with Sabby Volatility Warrant Master Fund, Ltd. (5)	1,394,429	476,191	918,238	16.4
Noam Rubinstein(6)(7)	92,016	35,120	56,896	1.2
Craig Schwabe(6)(8)	5,418	3,763	1,655	*
Michael Vasinkevich(6)(9)	187,374	71,493	115,881	2.3
Charles Worthman(6)(10)	6,851	1,115	5,736	*

\* Less than one percent

- (1) Assumes the exercise in full of the warrants and sale of all warrant shares registered pursuant to this prospectus, although the selling stockholders are under no obligation known to us to sell any shares of common stock at this time.
- (2) Before offering includes purchase warrants to purchase 305,715 shares of common stock, all of which are held directly by Intracoastal Capital, LLC ("Intracoastal"). The purchase warrants are subject to a beneficial ownership limitation of 9.99%, which does not permit Intracoastal to exercise that portion of the purchase warrants that would result in Intracoastal and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Mitchell P. Kopin and Daniel B. Asher, each of whom are managers of Intracoastal, have shared voting control and investment discretion over the securities reported herein that are held by Intracoastal. As a result, each of Mr. Kopin and Mr. Asher may be deemed to beneficially own the securities held by Intracoastal. The address of each of Mr. Kopin and Intracoastal is 245 Palm Trail, Delray Beach, Florida 33483. The address of Mr. Asher is 111 W. Jackson Boulevard, Suite 2000, Chicago, Illinois 60604.
- (3) Before offering includes (i) purchase warrants to purchase 457,143 shares of common stock and (ii) other warrants to purchase 40,078 shares of common stock, all of which are directly held by CVI Investments, Inc. ("CVI"). Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit CVI to exercise that portion of the warrants that would result in CVI and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Heights Capital Management, Inc. ("Heights"), the authorized agent of CVI, has discretionary authority to vote and dispose of the shares held by CVI and may be deemed to be the beneficial owner of these shares. Martin Kobinger, in his capacity as Investment Manager of Heights may also be deemed to have investment discretion and voting power over the shares held by CVI. Mr. Kobinger disclaims any such beneficial ownership of the shares. CVI's address is c/o Heights Capital Management, Inc., 101 California Street, Suite 3250, San Francisco, CA 94111.
- (4) Before offering includes (i) 254,597 shares of common stock, (ii) purchase warrants to purchase 476,191 shares of common stock and (iii) other warrants to purchase 727,273 shares of common

stock, all of which are held directly by Armistice Capital Master Fund Ltd. ("Armistice Fund"). Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit Armistice Fund to exercise that portion of the warrants that would result in Armistice Fund and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Steven Boyd is the Managing Member of Armistice Capital, LLC, which acts as the investment manager of Armistice Fund. As a result, Mr. Boyd may be deemed to beneficially own the securities held by Armistice Fund. The address of Armistice Fund is c/o dms Corporate Services Ltd., 20 Genesis Close, P.O. Box 314, Grand Cayman KY1-1104, Cayman Islands, and the address of each of Armistice Capital LLC and Mr. Boyd is 510 Madison Avenue, 7th Floor, New York, NY 10022.

- (5) Before offering includes (i) purchase warrants to purchase 476,191 shares of common stock and (ii) other warrants to purchase 918,238 shares of common stock, all of which are held directly by Sabby Volatility Warrant Master Fund, Ltd. ("SVWWMF"). Certain of the warrants are subject to a beneficial ownership limitation of 4.99%, which does not permit SVWWMF to exercise that portion of the warrants that would result in SVWWMF and its affiliates owning, after exercise, a number of shares of common stock in excess of the beneficial ownership limitation. The amounts and percentages in the table do not give effect to the beneficial ownership limitation. Hal Mintz is the manager of Sabby Management, LLC, which acts as the investment manager of SVWWMF. As a result, Mr. Mintz may be deemed to beneficially own the securities held by SVWWMF. The address of each of SVWWMF, Sabby Management LLC and Mr. Mintz is c/o Sabby Management, LLC, 10 Mountainview Road, Suite 205, Upper Saddle River, New Jersey 07458.
- (6) The selling stockholder is an affiliate of a registered broker-dealer.
- (7) Before the offering includes placement agent warrants to purchase 35,120 shares of common stock and other warrants to purchase 56,896 shares of common stock. The address of Mr. Rubinstein is c/o H.C. Wainwright & Co., LLC, 430 Park Avenue, 3<sup>rd</sup> Floor, New York, New York 10022.
- (8) Before the offering reflects placement agent warrants to purchase 3,763 shares of common stock and other warrants to purchase 1,655 shares of common stock. The address of Mr. Schwabe is c/o H.C. Wainwright & Co., LLC, 430 Park Avenue, 3<sup>rd</sup> Floor, New York, New York 10022.
- (9) Before the offering reflects placement agent warrants to purchase 71,493 shares of common stock and other warrants to purchase 115,881 shares of common stock. The address of Mr. Vasinkevich is c/o H.C. Wainwright & Co., LLC, 430 Park Avenue, 3<sup>rd</sup> Floor, New York, New York 10022.
- (10) Before the offering reflects placement agent warrants to purchase 1,115 shares of common stock and other warrants to purchase 5,736 shares of common stock. The address of Mr. Worthman is c/o H.C. Wainwright & Co., LLC, 430 Park Avenue, 3<sup>rd</sup> Floor, New York, New York 10022.

#### **Other Relationships with the Selling Stockholders**

Messrs. Rubinstein, Schwabe, Vasinkevich, and Worthman, selling stockholders, are each affiliated with Wainwright, which acted as the placement agent in the concurrent private placement of the purchase warrants for which we are registering the underlying shares in the registration statement of which this prospectus forms a part, and received the placement agent warrants for which we are registering the underlying shares in the registration statement of which this prospectus forms a part as compensation in connection therewith. From time to time, Wainwright may provide in the future various advisory, investment and commercial banking and other services to us in the ordinary course of business, for which they have received and may continue to receive customary fees and commissions. Wainwright acted as exclusive financial advisor for our November 2019 public offering and March 2020 public offering, for which it received compensation. Except with respect to the foregoing, none of the selling stockholders has, or within the past three years has had, any position, office or other material relationship with us, other than as a result of the ownership of our shares or other securities.

## PLAN OF DISTRIBUTION

We are registering the warrant shares issuable to the selling stockholders to permit the resale of these shares of common stock by the selling stockholders from time to time from after the date of this prospectus. We will not receive any of the proceeds from the sale by the selling stockholders of the warrant shares. We will bear the fees and expenses incident to our obligation to register the shares of common stock, however the selling stockholders will bear legal and advisor fees, commissions and discounts, if any, attributable to their respective sales of the warrant shares.

Each selling stockholder may, from time to time, sell any or all of its warrant shares covered hereby on The Nasdaq Capital Market or any other stock exchange, market or trading facility on which the shares can be traded or in private transactions. These sales may be at fixed prices, at prevailing market prices at the time of the sale, at varying prices determined at the time of sale, or privately negotiated prices. A selling stockholder may use any one or more of the following methods when selling shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- underwritten transactions;
- settlement of short sales, to the extent permitted by law;
- in transactions through broker-dealers that agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- through the distribution of the common stock by any selling stockholder to its partners, members or stockholders;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell the shares of common stock under Rule 144 under the Securities Act, if available, rather than under this prospectus.

If underwriters are used in the sale, the shares of common stock will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. In connection with any such underwritten sale of shares of common stock, underwriters may receive compensation from the selling stockholders, for whom they may act as agents, in the form of discounts, concessions or commissions. If the selling stockholders use an underwriter or underwriters to effectuate the sale of shares of common stock, we and/or they will execute an underwriting agreement with those underwriters at the time of sale of those shares of common stock. To the extent required by law, the names of the underwriters will be set forth in a prospectus supplement or, if appropriate, a post-effective amendment to the registration statement that includes the prospectus supplement and the accompanying prospectus used by the underwriters to sell those securities. The obligations of the underwriters to purchase those shares of common stock will be subject to certain

conditions precedent, and unless otherwise specified in a prospectus supplement, the underwriters will be obligated to purchase all the shares of common stock offered by such prospectus supplement if any of such shares of common stock are purchased. Any public offering price and any discounts or concessions allowed or re-allowed or paid to dealers may be changed from time to time.

Broker-dealers engaged by the selling stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of shares, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with FINRA Rule 2121.

In connection with the sale of the shares of common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the shares of common stock in the course of hedging the positions they assume. The selling stockholders may also sell the shares of common stock short and deliver these securities to close out their short positions or to return borrowed shares in connection with such short sales, or loan or pledge the shares of common stock to broker-dealers that in turn may sell these securities. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or create one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares of common stock offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the shares of common stock may be deemed to be "underwriters" within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such selling stockholders, broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Selling stockholders who are "underwriters" within the meaning of Section 2(11) of the Securities Act will be subject to the prospectus delivery requirements of the Securities Act and may be subject to certain statutory liabilities of, including but not limited to, Sections 11, 12 and 17 of the Securities Act and Rule 10b-5 under the Securities Exchange Act of 1934, as amended, or the Exchange Act.

We are required to pay certain fees and expenses incurred by us incident to the registration of the shares of common stock of the selling stockholders. We have also agreed to indemnify the selling stockholders holding purchase warrants against losses, claims, damages and liabilities, including liabilities under the Securities Act, with respect to the registration statement of which this prospectus forms a part.

The selling stockholders will be subject to the prospectus delivery requirements of the Securities Act, including Rule 172 thereunder, unless an exemption therefrom is available.

We agreed to cause the registration statement of which this prospectus is a part to remain effective until the date on which no selling stockholder owns any purchase warrants or common stock issuable upon exercise thereof. The shares of common stock will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the shares of common stock covered hereby may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the shares of common stock may not simultaneously engage in market making activities with respect to the shares of common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will

be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of shares of common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

The selling stockholders may decide not to sell any or all of the shares of common stock we registered on behalf of the selling stockholders pursuant to the registration statement of which this prospectus forms a part.

Once sold under the registration statement of which this prospectus forms a part, the shares of common stock will be freely tradable in the hands of persons other than our affiliates.

## **LEGAL MATTERS**

The validity of the common stock offered by this prospectus will be passed upon for us by Ballard Spahr LLP, Las Vegas, Nevada.

## **EXPERTS**

The consolidated financial statements of InVivo Therapeutics Holdings Corp. and subsidiary as of December 31, 2019 and 2018 and for the years then ended, incorporated in this Prospectus by reference from the InVivo Therapeutics Holdings Corp.'s Annual Report on Form 10-K for the year ended December 31, 2019 have been audited by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon (which report expresses an unqualified opinion and includes an explanatory paragraph relating to InVivo Therapeutics Holdings Corp.'s ability to continue as a going concern), incorporated herein by reference, and have been incorporated in this Prospectus and Registration Statement in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

## WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC; it is available at <http://www.sec.gov>. Our SEC filings are available to you on the SEC's Internet site. Copies of certain information filed by us with the SEC are also available on our website at [www.invivotherapeutics.com](http://www.invivotherapeutics.com). The information on our Internet website is not incorporated by reference in this prospectus.

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 should review the information and exhibits in the registration statement for further information about us and the securities we are offering. Statements in this prospectus concerning any document we filed as an exhibit to the registration statement or that we otherwise filed with the SEC are not intended to be comprehensive and are qualified by reference to these filings. You should review the complete document to evaluate these statements. You can obtain a copy of the registration statement and exhibits from the SEC's Internet site.

## INCORPORATION OF DOCUMENTS BY REFERENCE

The SEC allows us to incorporate by reference 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 in this prospectus by reference as of their respective dates of filing:

- (1) [Our Annual Report on Form 10-K for the fiscal year ended December 31, 2019, filed with the SEC on February 20, 2020;](#)
- (2) [Our Quarterly Report on Form 10-Q for the quarter ended March 31, 2020 filed with the SEC on May 13, 2020;](#)
- (3) Our Current Reports on Form 8-K filed on [January 16, 2020](#), [January 24, 2020](#), [February 3, 2020](#), [February 11, 2020](#), [February 24, 2020](#), [March 2, 2020](#); [March 11, 2020](#), and [April 16, 2020](#); and
- (4) [The description of our common stock contained in our Registration Statement on Form 8-A filed on April 15, 2015, 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, 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 in any documents previously incorporated by reference have been modified or superseded.



**1,826,731 Shares of Common Stock**

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**Prospectus**

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, 2020

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**PART II****INFORMATION NOT REQUIRED IN PROSPECTUS****ITEM 13. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION**

The following table sets forth the estimated costs and expenses payable by the registrant expected to be incurred in connection with the issuance and distribution of the common stock being registered hereby. All of such expenses are estimates, except for the Securities and Exchange Commission ("SEC") registration fee.

	<u>Amount to be Paid</u>
SEC registration fee	\$ 352
Printing fees and expenses	10,000
Legal fees and expenses	25,000
Accounting fees and expenses	12,500
Total	<u>\$ 47,852</u>

Each of the amounts set forth above, other than the registration fee is an estimate.

**ITEM 14. 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 also not have had reasonable cause to believe that his conduct was unlawful. In addition, any of our directors, officers, employees or agents are entitled to indemnification if such person is successful on the merits or otherwise in defense of any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative against actual and reasonable expenses incurred in connection with defending such action.

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 our 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 us 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. Unless our articles are amended to provide for greater liability, neither our directors nor officers are individually liable to us or our stockholders or creditors for any act or omission as a director or officer unless it is proven that: (i) such act or omission constituted a breach of such director's or officer's fiduciary duties; and (ii) such breach involved intentional misconduct, fraud or a knowing violation of law. These provisions may be sufficiently broad to indemnify such persons for liabilities arising under the Securities Act of 1933, as amended, in which case such provisions are against public policy as expressed such Act and are therefore unenforceable.

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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.

#### **ITEM 15. RECENT SALES OF UNREGISTERED SECURITIES.**

During the past three years, the registrant has sold the following securities which were not registered under the Securities Act of 1933, as amended, or the "Securities Act."

On April 15, 2020, we entered into a securities purchase agreement (the "April 2020 Purchase Agreement") with certain institutional investors (the "April 2020 Purchasers"), pursuant to which we issued an aggregate of 1,715,240 of our common stock in a registered direct offering (the "April 2020 Registered Offering"). Pursuant to the April 2020 Purchase Agreement, in a concurrent private placement, we also issued to the April 2020 Purchasers warrants (the "Series C Warrants") to purchase up to 1,715,240 shares of our common stock (the "Private Placement" and together with the April 2020 Registered Offering, the "April 2020 Offering"). The Series C Warrants have an exercise price of \$1.62 per share, are immediately exercisable and expire on October 17, 2025. H. C. Wainwright & Co., LLC ("Wainwright") acted as placement agent for the April 2020 Offering.

As consideration for the services provided to us by Wainwright as placement agent for our April 2020 Offering, we issued to designees of Wainwright placement agent warrants (the "April 2020 Placement Agent Warrants") to purchase an aggregate of 111,491 shares of common stock. The April 2020 Placement Agent Warrants have an exercise price of \$2.1875 per share, are immediately exercisable and expire April 15, 2025.

As consideration for the services provided to us by Wainwright as placement agent for our March 2020 public offering (the "March 2020 Offering") of common stock, Series A Warrants to purchase common stock and Series B Pre-funded Warrants to purchase common stock, we issued to designees of Wainwright placement agent warrants (the "March 2020 Placement Agent Warrants") to purchase an aggregate of 165,455 shares of common stock. The March 2020 Placement Agent Warrants have an exercise price of \$3.4375 per share, are immediately exercisable and expire March 6, 2025.

As consideration for the services provided to us by Wainwright as placement agent for our November 2019 public offering (the "2019 Offering") of our common stock, we agreed to issue to Wainwright, or its designees, placement agent warrants (the "2019 Placement Agent Warrants") to purchase an aggregate of 15,168 shares of common stock, which warrants were issued on January 21, 2020. The 2019 Placement Agent Warrants have an exercise price of \$4.50 per share, are immediately exercisable and expire on November 21, 2024.

On September 25, 2019, pursuant to the terms of our 2015 Equity Incentive Plan (the "Plan"), we granted 2,300 shares of our restricted common stock to Richard Toselli, our Chief Executive Officer, and 1,584 shares of our restricted common stock to Richard Christopher, our Chief Financial Officer, in consideration of Dr. Toselli's and Mr. Christopher's service as officers. These shares of restricted stock were issued under the Plan. We filed a registration statement on Form S-8 (File No. 333-234630) to register these shares of restricted common stock for resale on November 12, 2019.

On January 14, 2019, we granted to Mr. Christopher, as our new Chief Financial Officer, a stock option to purchase 3,000 shares of our common stock with an exercise price of \$45.90 per share. The option was granted as an inducement grant made outside of the Plan in accordance with Nasdaq Listing Rule 5635(c) (4) and in reliance upon the exemption from the registration requirements of the Securities Act. The option has a ten-year term. We filed a registration statement on Form S-8 (File No. 333-230644) to register the shares of Common Stock underlying the option on April 1, 2019.

On January 25, 2018, we entered into a purchase agreement, or the Purchase Agreement, with Lincoln Park Capital Fund, LLC, or Lincoln Park, which provided that, upon the terms and subject to

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the conditions and limitations set forth in the Purchase Agreement, Lincoln Park committed to purchase up to an aggregate of \$15 million of shares of our common stock over the 24-month term of the Purchase Agreement. We terminated the Purchase Agreement on May 9, 2019. We issued 574 shares of common stock to Lincoln Park in consideration for entering into the Purchase Agreement, and from January 2018 through the date of termination, we sold 8,561 shares of common stock under the Purchase Agreement, generating net proceeds of approximately \$3.1 million.

On August 10, 2017, we issued an aggregate of 2,696 shares of common stock to certain holders of warrants, dated May 9, 2014, in exchange for their warrants to purchase an aggregate of 771 shares of common stock.

Unless otherwise noted, all of the transactions described in Item 15 were exempt from registration under the Securities Act pursuant to Section 4(a)(2) of the Securities Act in that such sales did not involve a public offering or under Rule 506 of Regulation D promulgated under the Securities Act, and no underwriters were involved in the issuance of securities.

#### ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES.

(a) Exhibits

<u>Exhibit No.</u>	<u>Description</u>
3.1	<a href="#">Articles of Incorporation of InVivo Therapeutics Holdings Corp., as amended (incorporated by reference from Exhibit 3.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016, as filed with the SEC on August 4, 2016).</a>
3.2	<a href="#">Amended and Restated Bylaws of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 3.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2016, as filed with the SEC on May 6, 2016).</a>
3.3	<a href="#">Certificate of Change Pursuant to NRS 78.209 filed with Nevada Secretary of State, dated April 13, 2018 (incorporated by reference from Exhibit 3.1 to the Company's Current Report on Form 8-K, as filed with the SEC on April 16, 2018).</a>
3.4	<a href="#">Certificate of Amendment to Articles of Incorporation of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 3.1 to the Company's Current Report on Form 8-K, as filed with the SEC June 1, 2018).</a>
3.5	<a href="#">Certificate of Amendment to Articles of Incorporation of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 3.1 to the Company's Current Report on Form 8-K, as filed with the SEC January 24, 2020).</a>
3.6	<a href="#">Certificate of Change Pursuant to NRS 78.209 filed with Nevada Secretary of State, dated February 10, 2020 (incorporated by reference from Exhibit 3.1 to the Company's Current Report on Form 8-K, as filed with the SEC on February 11, 2020).</a>
4.1	<a href="#">Specimen Common Stock Certificate (incorporated by reference from Exhibit 4.2 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, as filed with the SEC on February 20, 2020).</a>
4.3	<a href="#">Form of Warrant of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC on May 6, 2014).</a>
4.4	<a href="#">Form of Warrant Agreement (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC on March 3, 2016).</a>
4.5	<a href="#">Form of Series A Warrant (incorporated by reference from Exhibit 4.5 to the Company's Registration Statement on Form S-1/A (File No. 333-224424) as filed with the SEC on June 14, 2018).</a>

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<u>Exhibit No.</u>	<u>Description</u>
4.6	<a href="#"><u>Amendment to Warrant Agency Agreement, by and between InVivo Therapeutics Holdings Corp. and Continental Stock Transfer &amp; Trust Company, as Warrant Agent, dated September 27, 2018 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on September 28, 2018).</u></a>
4.7	<a href="#"><u>Second Amendment to Warrant Agency Agreement and Warrant, by and between InVivo Therapeutics Holdings Corp. and Continental Stock Transfer &amp; Trust Company, as Warrant Agent, dated November 20, 2019 (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on November 21, 2019).</u></a>
4.8	<a href="#"><u>Form of Series A Warrant, as amended (incorporated by reference to Exhibit 10.2 to the Company's Current Report on Form 8-K, as filed with the SEC on September 28, 2018).</u></a>
4.9	<a href="#"><u>Form of Placement Agent Warrant of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC January 24, 2020).</u></a>
4.10	<a href="#"><u>Form of Series A Warrant (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC on March 11, 2020).</u></a>
4.11	<a href="#"><u>Form of Series B Pre-Funded Warrant (incorporated by reference from Exhibit 4.2 to the Company's Current Report on Form 8-K, as filed with the SEC on March 11, 2020).</u></a>
4.12	<a href="#"><u>Form of Placement Agent Warrant (incorporated by reference from Exhibit 4.3 to the Company's Current Report on Form 8-K, as filed with the SEC on March 11, 2020).</u></a>
4.13	<a href="#"><u>Form of Series C Warrant (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC on April 16, 2020).</u></a>
5.1+	<a href="#"><u>Opinion of Ballard Spahr LLP</u></a>
10.1*	<a href="#"><u>InVivo Therapeutics Corp. 2007 Employee, Director and Consultant Stock Plan (incorporated by reference from Exhibit 10.9 to the Company's Current Report on Form 8-K, as filed with the SEC on November 1, 2010).</u></a>
10.2(i)*	<a href="#"><u>Form of Incentive Stock Option Agreement by and between InVivo Therapeutics Corp. and participants under the 2007 Employee, Director and Consultant Stock Plan (incorporated by reference from Exhibit 10.11(i) to the Company's Current Report on Form 8-K, as filed with the SEC on November 1, 2010).</u></a>
10.2(ii)*	<a href="#"><u>Form of Non-Qualified Stock Option Agreement by and between InVivo Therapeutics Corp. and participants under the 2007 Employee, Director and Consultant Stock Plan (incorporated by reference from Exhibit 10.11(ii) to the Company's Current Report on Form 8-K, as filed with the SEC on November 1, 2010).</u></a>
10.3*	<a href="#"><u>InVivo Therapeutics Holdings Corp. 2010 Equity Incentive Plan, as amended (incorporated by reference to Appendix A to the Company's Schedule 14A Proxy Statement, as filed with the SEC on April 19, 2013).</u></a>
10.4(i)*	<a href="#"><u>Form of Incentive Stock Option Agreement by and between InVivo Therapeutics Holdings Corp. and participants under the 2010 Equity Incentive Plan (incorporated by reference from Exhibit 10.12(i) to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2010, as filed with the SEC on March 24, 2011).</u></a>
10.4(ii)*	<a href="#"><u>Form of Non-Qualified Stock Option Agreement by and between InVivo Therapeutics Holdings Corp. and participants under the 2010 Equity Incentive Plan (incorporated by reference from Exhibit 10.12(ii) to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2010, as filed with the SEC on March 24, 2011).</u></a>

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<u>Exhibit No.</u>	<u>Description</u>
10.5	<a href="#"><u>Form of Scientific Advisory Board Agreement entered into by InVivo Therapeutics Corp. (incorporated by reference from Exhibit 10.13 to the Company's Current Report on Form 8-K, as filed with the SEC on November 1, 2010).</u></a>
10.6	<a href="#"><u>Exclusive License Agreement dated July 2007 between InVivo Therapeutics Corporation and Children's Medical Center Corporation (incorporated by reference from Exhibit 10.1 to Amendment No. 2 to the Company's Quarterly Report on Form 10-Q/A for the quarter ended March 31, 2011, as filed with the SEC on July 18, 2011).</u></a>
10.7	<a href="#"><u>Amendment One to the Exclusive License, dated May 12, 2011, by and between Children's Medical Center Corporation and InVivo Therapeutics Corporation (incorporated by reference from Exhibit 10.22 to the Amendment No. 4 to the Company's Registration Statement on Form S-1/A (File No. 333-171998), as filed with the SEC on July 19, 2011).</u></a>
10.8	<a href="#"><u>Amendment Two to the Exclusive License, dated August 29, 2017, by and between Children's Medical Center Corporation and InVivo Therapeutics Corporation (incorporated by reference from Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q/A for the quarter ended September 30, 2017, as filed with the SEC on January 3, 2018).</u></a>
10.9	<a href="#"><u>Form of Indemnification Agreement (for directors and officers) (incorporated by reference from Exhibit 10.19 to the Company's Registration Statement on Form S-1 (File No. 333-171998), as filed with the SEC on February 1, 2011).</u></a>
10.10	<a href="#"><u>Lease Agreement, dated November 30, 2011, between InVivo Therapeutics Corporation and RB Kendall Fee, LLC (incorporated by reference from Exhibit 10.25 to the Company's Registration Statement on Form S-1 (File No. 333-178584), as filed with the SEC on December 16, 2011).</u></a>
10.11	<a href="#"><u>Lease Guaranty, dated November 30, 2011, by InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 10.26 to the Company's Registration Statement on Form S-1 (File No. 333-178584), as filed with the SEC on December 16, 2011).</u></a>
10.12	<a href="#"><u>First Amendment of Lease between InVivo Therapeutics Corporation and RB Kendall Fee, LLC, dated September 17, 2012 (incorporated by reference from Exhibit 10.31 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2012, as filed with the SEC on March 12, 2013).</u></a>
10.13	<a href="#"><u>Second Amendment of Lease between InVivo Therapeutics Corporation and RB Kendall Fee, LLC, dated October 31, 2017 (incorporated by reference from Exhibit 10.13 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2017, as filed with the SEC on March 12, 2018).</u></a>
10.14*	<a href="#"><u>InVivo Therapeutics Holdings Corp. Employee Stock Purchase Plan (incorporated by reference from Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on June 16, 2015).</u></a>
10.15*	<a href="#"><u>InVivo Therapeutics Holdings Corp. 2015 Equity Incentive Plan (incorporated by reference from Exhibit 10.15 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, as filed with the SEC on February 20, 2020).</u></a>
10.17*	<a href="#"><u>Consulting Agreement, dated June 29, 2017, by and between InVivo Therapeutics Holdings Corp. and Richard Toselli, M.D. (incorporated by reference from Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended June 30, 2017, as filed with the SEC on August 8, 2017).</u></a>

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<u>Exhibit No.</u>	<u>Description</u>
10.18*	<a href="#"><u>Employment Agreement, dated December 18, 2017, by and between Richard Toselli and InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 10.27 to the Company's Registration Statement on Form S-1/A (File No. 333-222738) as filed with the SEC on February 9, 2018).</u></a>
10.19	<a href="#"><u>Assignment and Assumption of Lease and Consent at Landlord, dated May 3, 2018 by and among Shiseido Americas Corporation, ARE-MA Region No. 59 LLC and InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 10.34 to the Company's Registration Statement on Form S-1/A (File No. 333-224424) as filed with the SEC on June 14, 2018).</u></a>
10.20	<a href="#"><u>Sublease, dated May 3, 2018, by and between Shiseido Americas Corporation and InVivo Therapeutics Holdings Corp.(incorporated by reference from Exhibit 10.35 to the Company's Registration Statement on Form S-1/A (File No. 333- 224424) as filed with the SEC on June 14, 2018).</u></a>
10.21*	<a href="#"><u>Amendment to Employment Agreement, by and between InVivo Therapeutics Holdings Corp. and Richard Toselli, dated October 1, 2018 (incorporated by reference from Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on October 5, 2018).</u></a>
10.22*	<a href="#"><u>Employment Agreement, dated December 24, 2018, between the Company and Richard Christopher (incorporated by reference from Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on January 14, 2019).</u></a>
10.23*	<a href="#"><u>Nonstatutory Stock Option Agreement, dated January 14, 2019, between the Company and Richard Christopher (incorporated by reference from Exhibit 10.2 to the Company's Current Report on Form 8-K, as filed with the SEC on January 14, 2019).</u></a>
10.24*	<a href="#"><u>Form of Restricted Stock Agreement under the Company's 2015 Equity Incentive Plan (incorporated by reference from Exhibit 10.1 to the Company's Current Report on Form 8-K, as filed with the SEC on September 27, 2019).</u></a>
10.25*	<a href="#"><u>Form of Restricted Stock Unit Agreement under the Company's 2015 Equity Incentive Plan (incorporated by reference from Exhibit 10.25 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2019, as filed with the SEC on February 20, 2020).</u></a>
21.1	<a href="#"><u>Subsidiaries of InVivo Therapeutics Holdings Corp. (incorporated by reference from Exhibit 21.1 to the Company's Current Report on Form 8-K, as filed with the SEC on November 1, 2010).</u></a>
23.1+	<a href="#"><u>Consent of RSM US LLP</u></a>
23.2+	<a href="#"><u>Consent of Ballard Spahr LLP (included in Exhibit 5.1)</u></a>
24.1+	<a href="#"><u>Power of Attorney (contained on the signature page to the Registration Statement).</u></a>

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\* Indicates a management contract or compensatory plan or arrangement.

+ Filed herewith.

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**ITEM 17. UNDERTAKINGS.**

The undersigned registrant hereby undertakes:

(a)(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933, as amended (the "Securities Act");

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in the volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20% change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement.

*provided, however*, that paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purposes of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at the time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for purposes of determining any liability under the Securities Act to any purchaser: each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness; *provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant's annual report pursuant to Section 13(a) or 15(d) of the Exchange Act (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

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(c) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers and controlling persons of the registrant pursuant to the indemnification provisions described herein, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act and will be governed by the final adjudication of such issue.

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**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on May 22, 2020.

**INVIVO THERAPEUTICS HOLDINGS CORP.**

Date: May 22, 2020

By: /s/ RICHARD TOSELLI

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Richard Toselli  
*President and Chief Executive Officer (Principal Executive Officer)*

Date: May 22, 2020

By: /s/ RICHARD CHRISTOPHER

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Richard Christopher  
*Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)*

**SIGNATURES**

**POWER OF ATTORNEY**

**KNOW ALL PERSONS BY THESE PRESENTS:**

That the undersigned officers and directors of InVivo Therapeutics Holdings Corp., a Nevada corporation, do hereby constitute and appoint Richard Toselli and Richard Christopher and each of them his or her true and lawful attorney-in-fact and agent with full power and authority to do any and all acts and things and to execute any and all instruments which said attorney and agent, determine may be necessary or advisable or required to enable said corporation to comply with the Securities Act of 1933, as amended, and any rules or regulations or requirements of the Securities and Exchange Commission in connection with this Registration Statement. Without limiting the generality of the foregoing power and authority, the powers granted include the power and authority to sign the names of the undersigned officers and directors in the capacities indicated below to this Registration Statement, and to any and all instruments or documents filed as part of or in conjunction with this Registration Statement or amendments or supplements thereof, including post-effective amendments, to this Registration Statement or any registration statement relating to this offering to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and each of the undersigned hereby ratifies and confirms that said attorney and agent, shall do or cause to be done by virtue thereof. This Power of Attorney may be signed in several counterparts.

IN WITNESS WHEREOF, each of the undersigned has executed this Power of Attorney. In accordance with the requirements of the Securities Act of 1933, as amended, this Registration Statement was signed by the following persons in the capacities and on the dates stated:

Signature

Title

Date

/s/ RICHARD TOSELLI

President and Chief Executive Officer  
(Principal Executive Officer) and Director

May 22, 2020

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/s/ Richard Toselli

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ RICHARD CHRISTOPHER</u> Richard Christopher	Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)	May 22, 2020
<u>/s/ C. ANN MERRIFIELD</u> C. Ann Merrifield	Director	May 22, 2020
<u>/s/ DANIEL R. MARSHAK</u> Daniel R. Marshak	Director	May 22, 2020
<u>/s/ CHRISTINA MORRISON</u> Christina Morrison	Director	May 22, 2020
<u>/s/ RICHARD ROBERTS</u> Richard J. Roberts	Director	May 22, 2020
<u>/s/ ROBERT J. ROSENTHAL</u> Robert J. Rosenthal	Director	May 22, 2020

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1980 Festival Plaza Drive, Suite 900  
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TEL 702.471.7000  
FAX 702.471.7070  
www.ballardspahr.com

May 22, 2020

InVivo Therapeutics Holdings Corp.  
One Kendall Square, Suite B14402  
Cambridge, MA 02139

**Re: Registration Statement on Form S-1**

Ladies and Gentlemen:

We have acted as counsel to InVivo Therapeutics Holdings Corp., a Nevada corporation (the "Corporation"), in connection with the Corporation's Registration Statement on Form S-1 (the "Registration Statement"), filed with the United States Securities and Exchange Commission (the "Commission") on the date referenced above under the Securities Act of 1933, as amended (the "Securities Act"), for the resale by the selling stockholders referred to in the Registration Statement (the "Selling Stockholders") of an aggregate of up to 1,826,731 shares of the Corporation's common stock (the "Shares"), par value \$0.00001 per share (the "Common Stock") upon the exercise from time to time of the Corporation's outstanding Series C Common Stock purchase warrants and placement agent warrants.

In connection therewith, we have examined the following documents: (a) the Articles of Incorporation of the Corporation filed with the Nevada Secretary of State on April 2, 2003, as amended (the "Articles"); (b) the Amended and Restated Bylaws of the Corporation, dated as of March 29, 2016; (c) the resolutions adopted by the Corporation's board of directors authorizing the filing of the Registration Statement, amongst other items (the "Directors' Resolutions"); and (d) the Registration Statement. We have also examined such corporate records and other agreements, documents and instruments, and such certificates or comparable documents of public officials and officers and representatives of the Corporation and have made such inquiries of such officers and representatives and have considered such matters of law as we have deemed appropriate as the basis for the opinion hereinafter set forth.

In delivering this opinion, we have assumed the genuineness of all signatures, the legal capacity of natural persons, the authenticity of all documents submitted to us as originals, the conformity to originals of all documents submitted to us as certified, photostatic or conformed copies, the authenticity of originals of all such latter documents, and the accuracy and completeness of all records, information and statements submitted to

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us by officers and representatives of the Corporation. In making our examination of documents executed by parties other than the Corporation, we have assumed that such parties had the power, corporate or other, to enter into and perform all obligations thereunder and have also assumed the due authorization of all requisite action, corporate or other, and execution and delivery by such parties of such documents and the validity and binding effect thereof with respect to such parties.

The opinion expressed below is based on the assumption that the Registration Statement, and any amendments or supplements thereto (including any post-effective amendments) have been filed by the Corporation with the Commission and will be effective at the time that any of the Shares are sold by the Selling Stockholders, and that persons acquiring the Shares will receive a prospectus containing all of the information required by Part I of the Registration Statement before acquiring such Shares.

Based upon the foregoing and subject to the assumptions, exceptions, limitations and qualifications set forth herein, we are of the opinion that the Shares have been duly authorized and, when, as and if, issued and paid for as described in the Registration Statement, in accordance with the Directors' Resolutions, will be validly issued, fully paid and non-assessable.

This opinion is limited to the present laws of the State of Nevada. We express no opinion as to the laws of any other jurisdiction, of the United States of America, or to any state "Blue Sky" laws and regulations, and no opinion regarding the statutes, administrative decisions, rules and regulations or requirements of any county, municipality or subdivision or other local authority of any jurisdiction.

We do not undertake to advise you or anyone else of any changes in the opinions expressed herein resulting from changes in law, changes in fact or any other matters that hereafter might occur or be brought to our attention.

We hereby consent to the sole use of this opinion as an exhibit to the Registration Statement. In giving this consent, we do not admit that we are within the category of persons whose consent is required by Section 7 of the Securities Act and the rules and regulations promulgated thereunder.

Very truly yours,

/s/ Ballard Spahr LLP

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**Consent of Independent Registered Public Accounting Firm**

We consent to the incorporation by reference in this Registration Statement on Form S-1 and related Prospectus of InVivo Therapeutics Holdings Corp. of our report dated February 20, 2020, relating to the consolidated financial statements of InVivo Therapeutics Holdings Corp. and subsidiary, appearing in the Annual Report on Form 10-K of InVivo Therapeutics Holdings Corp. for the year ended December 31, 2019.

We also consent to the reference to our firm under the heading "Experts" in such Prospectus.

/s/ RSM US LLP

Boston, MA  
May 22, 2020

QuickLinks

[Exhibit 23.1](#)

[Consent of Independent Registered Public Accounting Firm](#)