

PROSPECTUS



Up to \$2,605,728

Common Stock

We have entered into a Sales Agreement (the “Sales Agreement”) with H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC (each an “Agent” and together, the “Agents”), relating to shares of our common stock offered by this prospectus. In accordance with the terms of the Sales Agreement, we may offer and sell shares of our common stock from time to time through the Agents, having an aggregate offering price of up to \$2,605,728, pursuant to this prospectus. Of the shares of our common stock covered by the Sales Agreement and the related prospectus supplement, dated March 16, 2018 and prospectus dated January 29, 2021, covering the issuance of shares of our common stock pursuant to the Sales Agreement, as of January 23, 2024, we have issued and sold an aggregate of 3,982,416 shares of our common stock for gross proceeds of approximately \$45.1 million.

Our common stock is listed on the Nasdaq Capital Market under the symbol “ONVO.” On February 7, 2024, the last reported sale price of our common stock on the Nasdaq Capital Market was \$0.97 per share.

Sales of our common stock, if any, under this prospectus may be made in sales deemed to be an “at the market offering” as defined in Rule 415(a)(4) promulgated under the Securities Act of 1933, as amended (the “Securities Act”). The Agents are not required to sell any specific number or dollar amounts of securities but will act as sales agents using their commercially reasonable efforts consistent with their respective normal trading and sales practices, on mutually agreed terms between the Agents and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

Each Agent will be entitled to compensation under the terms of the Sales Agreement at a commission rate of up to 3.0% of the gross sales price per share sold by such Agent. In connection with the sale of the common stock on our behalf, the Agents will each be deemed to be an “underwriter” within the meaning of the Securities Act and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to the Agents against certain civil liabilities, including liabilities under the Securities Act.

Investing in our common stock involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “Risk Factors” on page S-5 of this prospectus and in any applicable free writing prospectuses, and under similar headings in the documents that are incorporated by reference into this prospectus.

The aggregate market value of our outstanding common stock held by non-affiliates was approximately \$12.3 million, which was calculated based on 9,830,362 shares of outstanding common stock held by non-affiliates as of January 23, 2024, and a price per share of \$1.25, the closing price of our common stock on December 1, 2023. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities pursuant to shelf registration statements, including the registration statement of which this prospectus is a part, with a value more than one-third of the aggregate market value of our common stock held by non-affiliates in any 12 month period, so long as the aggregate market value of our common stock held by non-affiliates is less than \$75 million. In the event that subsequent to the effective date of the registration statement of which this prospectus is a part, the aggregate market value of our outstanding common stock held by non-affiliates equals or exceeds \$75 million, then the one-third limitation on sales shall not apply to additional sales made pursuant to the registration statement of which this prospectus is a part. We have sold an aggregate of 1,135,940 shares of our common stock for gross proceeds of approximately \$1.5 million pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to, and including, the date of this prospectus.

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.

H.C. Wainwright & Co.

JonesTrading

The date of this prospectus is February 8, 2024.

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ABOUT THIS PROSPECTUS

This prospectus is part of a “shelf” registration statement on Form S-3 that we filed with the U.S. Securities and Exchange Commission (the “SEC”), using a “shelf” registration process. This prospectus describes the specific terms of this offering of shares of common stock and also adds to and updates information contained in the documents incorporated by reference into this prospectus. This prospectus relates only to an offering of up to \$2,605,728 of shares of our common stock through or to the Agents. These sales, if any, will be made pursuant to the terms of the Sales Agreement entered into between us and the Agents on March 16, 2018, a copy of which was filed as Exhibit 10.1 to the Company’s Current Report on Form 8-K filed with the SEC on March 16, 2018, which is incorporated by reference into this prospectus.

Before buying any of the common stock that we are offering, we urge you to carefully read this prospectus together with the information incorporated by reference as described under the headings “Where You Can Find More Information” and “Incorporation of Documents by Reference” in this prospectus. These documents contain important information that you should consider when making your investment decision.

You should rely only on the information contained in, or incorporated by reference into this prospectus and in any free writing prospectus that we may authorize for use in connection with this offering. We have not, and the Agents have not, authorized any other person to provide you with different information. If anyone provides you with additional, different or inconsistent information, you should not rely on it. We are not, and the Agents are not, making an offer to sell or soliciting an offer to buy our common stock in any jurisdiction in which an offer or solicitation is not authorized or in which the person making that offer or solicitation is not qualified to do so or to anyone to whom it is unlawful to make an offer or solicitation.

You should not assume that the information appearing in this prospectus, the documents incorporated by reference into this prospectus and in any free writing prospectus that we may authorize for use in connection with this offering, is accurate on any date subsequent to the date set forth on the front cover of this prospectus or on any date subsequent to the date of the document incorporated by reference, as applicable. Our business, financial condition, results of operations and prospects may have changed since those dates. You should read this prospectus, the documents incorporated by reference into this prospectus and any free writing prospectus that we may authorize for use in connection with this offering, in their entirety before making an investment decision. You should also read and consider the information in the documents to which we have referred you in the sections of this prospectus supplement entitled “Where You Can Find More Information” and “Incorporation of Documents by Reference.”

We are offering to sell, and seeking offers to buy, the securities described in this prospectus only in jurisdictions where offers and sales are permitted. The distribution of this prospectus and the offering of the common stock in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the common stock and the distribution of this prospectus outside the United States. This prospectus does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to any document that is incorporated by reference into this prospectus were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

We own or have rights to use the trademarks and trade names that we use in conjunction with the operation of our business. Solely for convenience, our trademarks and trade names referred to in this prospectus may appear without the ® or ™ 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 the right of the applicable licensor to these trademarks and trade names.

DISCLOSURE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference into this prospectus may contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”), about Organovo. These forward-looking statements are intended to be covered by the safe harbor for forward-looking statements provided by the Private Securities Litigation Reform Act of 1995. Forward-looking statements are not statements of historical fact, and can be identified by the use of forward-looking terminology such as “believes”, “expects”, “may”, “will”, “could”, “should”, “projects”, “plans”, “goal”, “targets”, “potential”, “estimates”, “pro forma”, “seeks”, “intends” or “anticipates” or the negative thereof or comparable terminology. Forward-looking statements include discussions of strategy, financial projections, guidance and estimates (including their underlying assumptions), statements regarding plans, objectives, expectations or consequences of various transactions, and statements about the future performance, operations, products and services of Organovo. We caution our stockholders and other readers not to place undue reliance on such statements.

You should read this prospectus and the documents incorporated by reference completely and with the understanding that our actual future results may be materially different from what we currently expect. Our business and operations are and will be subject to a variety of risks, uncertainties and other factors. Consequently, actual results and experience may materially differ from those contained in any forward-looking statements. Such risks, uncertainties and other factors that could cause actual results and experience to differ from those projected include, but are not limited to, the risk factors set forth in Part I – Item 1A, “Risk Factors”, in our Annual Report on Form 10-K for the year ended March 31, 2023, filed with the SEC on July 14, 2023, as amended by Amendment No. 1 on Form 10-K/A, filed with the SEC on July 31, 2023, in our Quarterly Report on Form 10-Q for the quarter ended June 30, 2023, filed with the SEC on August 10, 2023, and in our Quarterly Report on Form 10-Q for the quarter ended September 30, 2023, filed with the SEC on November 9, 2023, and elsewhere in the other documents incorporated by reference into this prospectus.

You should assume that the information appearing in this prospectus, any related free writing prospectus and any document incorporated herein by reference is accurate as of its date only. Because the risk factors referred to above could cause actual results or outcomes to differ materially from those expressed in any forward-looking statements made by us or on our behalf, you should not place undue reliance on any forward-looking statements. Further, any forward-looking statement speaks only as of the date on which it is made. New factors emerge from time to time, and it is not possible for us to predict which factors will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. All written or oral forward-looking statements attributable to us or any person acting on our behalf made after the date of this prospectus are expressly qualified in their entirety by the risk factors and cautionary statements contained in and incorporated by reference into this prospectus. Unless legally required, we do not undertake any obligation to release publicly any revisions to such forward-looking statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events.

PROSPECTUS SUMMARY

This summary highlights certain information about us, this offering and selected information contained elsewhere in or incorporated by reference into this prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding whether to invest in our common stock. For a more complete understanding of our company and this offering, we encourage you to read and consider carefully the more detailed information in this prospectus, including the information incorporated by reference into this prospectus and the information included in any free writing prospectus that we have authorized for use in connection with this offering, including the information contained in and incorporated by reference under the heading "Risk Factors" beginning on page S-5 of this prospectus, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus.

Overview

Organovo Holdings, Inc. (Nasdaq: ONVO), together with its wholly owned subsidiaries (collectively, "Organovo", "we", "us" and "our") is a clinical stage biotechnology company that is focused on developing FXR314 in inflammatory bowel disease ("IBD"), including ulcerative colitis ("UC"), based on demonstration of clinical promise in three-dimensional (3D) human tissues as well as strong preclinical data. FXR is a mediator of gastrointestinal and liver diseases. FXR agonism has been tested in a variety of preclinical models of IBD. FXR314 is the lead compound in our established FXR program containing two clinically tested compounds (including FXR314) and over 2,000 discovery or preclinical compounds. FXR314 is a drug with safety and tolerability after daily oral dosing in Phase 1 and Phase 2 trials. Further, FXR314 has FDA clinical trial authorization for a Phase 2 trial in UC.

Our current clinical focus is in advancing FXR314 in IBD, including UC and Crohn's disease ("CD"). We plan to start a Phase 2a clinical trial in UC in the calendar year 2024.

Our second focus is building high fidelity, 3D tissues that recapitulate key aspects of human disease. We use our proprietary technology to build functional 3D human tissues that mimic key aspects of native human tissue composition, architecture, function and disease. We believe these attributes can enable critical complex, multicellular disease models that can be used to develop clinically effective drugs across multiple therapeutic areas.

As with the clinical development program, we are initially focusing on the intestine and have ongoing 3D tissue development efforts in human tissue models of UC and CD. We use these models to identify new molecular targets responsible for driving the disease and to explore the mechanism of action of known drugs including FXR314 and related molecules. We intend to initiate drug discovery programs around these new validated targets to identify drug candidates for partnering and/or internal clinical development.

Our current understanding of intestinal tissue models and IBD disease models leads us to believe that we can create models that provide greater insight into the biology of these diseases than are generally currently available. We are creating high fidelity disease models, leveraging our prior work including the work found in our peer-reviewed publication on bioprinted intestinal tissues (Madden et al. Bioprinted 3D Primary Human Intestinal Tissues Model Aspects of Native Physiology and ADME/Tox Functions. iScience. 2018 Apr 27;2:156-167. Doi: 10.1016/j.isci.2018.03.015.) Our advances include cell type-specific compartments, prevalent intercellular tight junctions, and the formation of microvascular structures.

Using these disease models, we intend to identify and validate novel therapeutic targets. After finding therapeutic drug targets, we intend to focus on developing novel small molecule, antibody, or other therapeutic drug candidates to treat the disease, and advance these novel drug candidates towards an Investigational New Drug ("IND") filing and potential future clinical trials.

We expect to broaden our work into additional therapeutic areas over time and are currently exploring specific tissues for development. In our work to identify the areas of interest, we evaluate areas that might be better served with 3D disease models than currently available models as well as the potential commercial opportunity. In line with these plans, we are building upon both our external and in house scientific expertise, which will be essential to our drug development effort.

For a complete description of our business, financial condition, results of operations and other important information, we refer you to our filings with the SEC that are incorporated by reference in this prospectus, including our Annual Report on Form 10-K, for the year ended March 31, 2023 as amended by Amendment No. 1 on Form 10-K/A, our Quarterly Report on Form 10-Q for the quarter ended June 30, 2023, our Quarterly Report on Form 10-Q for the quarter ended September 30, 2023. For instructions on how to find copies of these documents, see the section of this prospectus entitled “Where You Can Find More Information”.

Corporate Information

We were incorporated in Delaware under the name Organovo Holdings, Inc. in January 2012. We are operating the business of our subsidiaries, including Organovo, Inc., our wholly-owned subsidiary, which we acquired in February 2012. Organovo, Inc. was incorporated in Delaware in April 2007. Our common stock has traded on the Nasdaq Capital Market under the symbol “ONVO” since December 27, 2019. Prior to that time, it had traded on the Nasdaq Global Market under the symbol “ONVO” since August 8, 2016 and prior to that it traded on the NYSE MKT under the symbol “ONVO”.

Our principal executive offices are located at 11555 Sorrento Valley Road, Suite 100, San Diego, CA 92121, and our telephone number is (858) 224-1000. Our website address is www.organovo.com. Any information contained on, or that can be accessed through, our website is not incorporated by reference into, nor is it in any way part of this prospectus and should not be relied upon in connection with making any decision with respect to an investment in our securities. We are required to file annual, quarterly and current reports, proxy statements and other information with the SEC. You may obtain any of the documents filed by us with the SEC at no cost from the SEC’s website at <http://www.sec.gov>.

We are a “smaller reporting company” as defined in Rule 12b-2 of the Exchange Act and have elected to take advantage of certain of the scaled disclosure available for smaller reporting companies in this prospectus as well as our filings under the Exchange Act.

THE OFFERING

Common stock offered by us

Shares of our common stock having an aggregate offering price of up to \$2,605,728. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities pursuant to shelf registration statements, including the registration statement of which this prospectus supplement forms a part, in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below \$75.0 million, as measured in accordance with General Instruction I.B.6 of Form S-3.

Common stock to be outstanding after this offering

Up to 12,410,028 shares, assuming, for illustrative purposes, the sale of 2,554,635 shares at a price of \$1.02 per share, which was the closing price of our common stock on the Nasdaq Capital Market on January 23, 2024. The actual number of shares issued will vary depending on the sales prices under this offering.

Plan of distribution

“At the market offering” that may be made from time to time through the Agents. See “Plan of Distribution” on page S-12.

Use of proceeds

We currently intend to use the net proceeds from the sale of the securities offered hereby for operating costs, research and development and for general corporate purposes, including working capital. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus. See “Use of Proceeds” on page S-8 of this prospectus.

Risk factors

Investing in our common stock involves a high degree of risk. Please read the information contained in and incorporated by reference under the heading “Risk Factors” on page S-5 of this prospectus supplement, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement.

The Nasdaq Capital Market symbol

ONVO

The number of shares of common stock that will be outstanding after this offering as shown above is based on 8,719,453 shares of common stock outstanding as of September 30, 2023 and gives effect to the issuance and sale of 1,135,940 shares of common stock pursuant to the Sales Agreement between November 14, 2023 and January 23, 2024, but excludes the following, all as of September 30, 2023:

- 850,114 shares of common stock issuable upon the exercise of stock options outstanding at a weighted average exercise price of approximately \$5.05 per share;
- 125,142 shares of common stock issuable upon the vesting and settlement of outstanding restricted stock units;
- 1,000 shares of common stock available for issuance pursuant to the Organovo Holdings, Inc. 2021 Inducement Equity Incentive Plan (the “Inducement Plan”);

- 1,672,574 shares of common stock available for issuance pursuant to the Organovo Holdings, Inc. 2022 Equity Incentive Plan (the “2022 Plan”); and
- 58,426 shares of common stock available for issuance pursuant to the Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan (the “2016 Employee Stock Purchase Plan”).

Unless otherwise indicated, all information in this prospectus assumes no exercise of outstanding stock options or the issuance of shares of common stock pursuant to vesting and settlement of restricted stock units after September 30, 2023. The information in this prospectus also excludes 45,000 shares of common stock available for issuance pursuant to the Organovo Holdings, Inc. 2023 Employee Stock Purchase Plan that was approved by our stockholders on October 31, 2023.

RISK FACTORS

An investment in our common stock involves a high degree of risk. You should carefully consider the risks described under "Risk Factors" in our most recent Annual Report on Form 10-K, as amended, and Quarterly Reports on Form 10-Q, as updated by our subsequent filings under the Exchange Act, and all of the other information contained in this prospectus supplement and the accompanying prospectus, and incorporated by reference into this prospectus supplement and the accompanying prospectus, including our financial statements and related notes, before investing in our common stock. If any of the possible events described below or in those sections actually occur, our business, business prospects, cash flow, results of operations or financial condition could be harmed, the trading price of our common stock could decline, and you might lose all or part of your investment in our common stock. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our operations and results.

Risks Related to this Offering of our Common Stock

Resales of our common stock in the public market during this offering by our stockholders may cause the market price of our common stock to fall.

We may issue common stock from time to time in connection with this offering. This issuance from time to time of these new shares of our common stock, or our ability to issue these shares of common stock in this offering, could result in resales of our common stock by our current stockholders concerned about the potential dilution of their holdings. In turn, these resales could have the effect of depressing the market price for our common stock.

Our common stock prices may be volatile, which could cause the value of our common stock to decline.

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

- announcements of developments by us or our competitors, including new product and service offerings;
- our ability to execute on our new strategic plan;
- reduced government funding for research and development activities;
- actual or anticipated variations in our operating results;
- adoption of new accounting standards affecting our industry;
- additions or departures of key personnel;
- sales of our common stock or other securities in the open market;
- degree of coverage of securities analysts and reports and recommendations issued by securities analysts regarding our business;
- volume fluctuations in the trading of our common stock; and
- other events or factors, many of which are beyond our control.

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

You will experience immediate and substantial dilution.

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. For illustrative purposes only, assuming that an aggregate of \$2,605,728

of shares of our common stock are sold at the assumed offering price of \$1.02 per share (the last reported sale price of our common stock on the Nasdaq Capital Market on January 23, 2024), and after deducting commissions and estimated aggregate offering expenses payable by us, you will experience immediate dilution of \$0.24 per share, representing the difference between the assumed offering price and our pro forma as adjusted net tangible book value per share as of September 30, 2023 after giving effect to this offering. In addition, we are not restricted from issuing additional securities in the future, including shares of common stock, securities that are convertible into or exchangeable for, or that represent the right to receive, common stock or substantially similar securities. The issuance of these securities may cause further dilution to our stockholders. The exercise of outstanding stock options and the vesting of outstanding restricted stock units may also result in further dilution of your investment. See the section entitled “Dilution” on page S-10 below for a more detailed illustration of the dilution you may incur if you participate in this offering.

Our management will have broad discretion over the actual amounts and timing of the expenditures of the proceeds we receive in this offering and might not apply the proceeds in ways that enhance our operating results or increase the value of your investment.

Our management will have broad discretion as to the actual amounts and timing of the expenditures of the net proceeds from this offering, and you will be relying on the judgment of our management regarding the application of these proceeds. Our management might not apply the net proceeds of this offering in ways that enhance our operating results or increase the value of your investment. Additionally, until the net proceeds we receive are used, they may be placed in investments that do not produce income or that lose value.

The shares of common stock to be sold in this offering will be sold in “at the market offerings,” and investors who buy shares at different times will likely pay different prices.

Investors who purchase shares in this offering at different times will likely pay different prices, and so may experience different outcomes in their investment results. We will have discretion, subject to market demand, to vary the timing, prices, and number of shares sold, and there is no minimum or maximum sales price. Investors may experience a decline in the value of their shares as a result of share sales made at prices lower than the prices they paid.

The actual number of shares we will issue under the Sales Agreement with the Agents, and the prices at which the shares are sold, at any one time or in total, is uncertain.

Subject to certain limitations in the Sales Agreement with the Agents and compliance with applicable law, we have the discretion to deliver placement notices to the Agents at any time throughout the term of the Sales Agreements. The number of shares that are sold by the Agents after delivering a placement notice, and the prices at which shares are sold, will fluctuate based on the market price of the common stock during the sales period and limits we set with the Agents.

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

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering. We may sell shares or other securities in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be higher or lower than the price per share paid by investors in this offering.

We do not intend to pay dividends on our common stock for the foreseeable future.

We have paid no dividends on our common stock to date and it is not anticipated that any dividends will be paid to holders of our common stock in the foreseeable future. While our future dividend policy will be based on the

operating results and capital needs of our business, it is currently anticipated that any earnings will be retained to finance our future expansion and for the implementation of our business plan. As an investor, you should take note of the fact that a lack of a dividend can further affect the market value of our stock, and could significantly affect the value of any investment.

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

We are authorized to issue 200,000,000 shares of common stock and 25,000,000 shares of preferred stock. As of January 23, 2024, there were an aggregate of 10,040,074 shares of our common stock issued and outstanding on a fully diluted basis and no shares of preferred stock outstanding. That total for our common stock includes 2,464,149 shares of our common stock that may be issued upon the exercise of outstanding stock options or upon the settlement of outstanding restricted stock units or is available for issuance under our equity incentive plans and 45,000 shares of common stock that may be issued through our 2023 Employee Stock Purchase Plan.

In the future, we may issue additional authorized but previously unissued equity securities to raise funds to support our continued operations and to implement our business plan. We may also issue additional shares of our capital stock or other securities that are convertible into or exercisable for our capital stock in connection with hiring or retaining employees, future acquisitions, or for other business purposes. If we raise additional funds from the issuance of equity securities, substantial dilution to our existing stockholders may result. In addition, the future issuance of any such additional shares of capital stock may create downward pressure on the trading price of our common stock. There can be no assurance that we will not be required to issue additional shares, warrants or other convertible securities in the future in conjunction with any capital raising efforts, including at a price (or exercise prices) below the price at which shares of our common stock is currently traded on the Nasdaq Capital Market. Moreover, depending on market conditions, we cannot be sure that additional financing will be available when needed or that, if available, financing will be obtained on terms favorable to us or to our stockholders.

SEC regulations relating to the baby shelf limitation will limit the number of shares we may sell under this prospectus.

Under current U.S. Securities and Exchange Commission regulations, because our public float is currently less than \$75 million, and for so long as our public float remains less than \$75 million, in no event will we sell securities pursuant to shelf registration statements, including pursuant to the registration statement of which this prospectus is a part, with a value more than one-third of the aggregate market value of our common stock held by non-affiliates in any 12 month period. As of January 23, 2024, the aggregate market value of our outstanding common stock held by non-affiliates was approximately \$12.3 million, which was calculated based on 9,830,362 shares of outstanding common stock held by non-affiliates as of January 23, 2024, and a price per share of \$1.25, the closing price of our common stock on December 1, 2023. We have sold an aggregate of 1,135,940 shares of our common stock for gross proceeds of approximately \$1.5 million pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to, and including, the date of this prospectus.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds, if any, from the sale of our securities offered hereby. Except as described in any free writing prospectus that we may authorize to be provided to you, we currently intend to use the net proceeds from the sale of the securities offered hereby for operating costs, research and development and for general corporate purposes, including working capital. We may also use a portion of the net proceeds to invest in or acquire businesses or technologies that we believe are complementary to our own, although we have no current plans, commitments or agreements with respect to any acquisitions as of the date of this prospectus supplement.

The timing and amount of our actual expenditures will be based on many factors, including cash flows from operations and the anticipated growth of our business. As a result, our management will have broad discretion to allocate the net proceeds, if any, of the offerings. Pending their ultimate use, we intend to invest the net proceeds in short-term, investment-grade, interest-bearing instruments.

DIVIDEND POLICY

We have never declared or paid any dividends on our common stock and do not anticipate paying any in the foreseeable future. We currently intend to retain all of our future earnings, if any, to finance the operation and expansion of our business. Any future determination relating to our dividend policy will be made at the discretion of our Board of Directors and will depend on a number of factors, including future earnings, capital requirements, financial conditions, future prospects, contractual restrictions and covenants and other factors that our Board of Directors may deem relevant.

DILUTION

If you purchase our common stock in this offering, your interest will be diluted to the extent of the difference between the public offering price per share and the net tangible book value per share of our common stock after this offering.

As of September 30, 2023, we had net tangible book value of approximately \$5.9 million, or \$0.67 per share. Net tangible book value per share represents the amount of total tangible assets less total liabilities divided by the number of shares of our common stock outstanding.

Our pro forma net tangible book value as of September 30, 2023, before giving effect to this offering, was approximately \$7.4 million, or \$0.75 per share of our common stock. Pro forma net tangible book value, before the issuance and sale of shares of common stock in this offering, gives effect to the issuance of an aggregate of 1,135,940 shares of common stock between November 2023 and January 2024 pursuant to the Sales Agreement for net proceeds to us of approximately \$1.5 million.

After giving effect to (i) the pro forma adjustments set forth above and (ii) the sale of \$2,605,728 of shares of our common stock pursuant to the Sales Agreement at an assumed public offering price of \$1.02 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on January 23, 2024, after deducting commissions at an assumed rate of 3.0% and estimated aggregate offering expenses payable by us, our pro forma as adjusted net tangible book value as of September 30, 2023 would have been approximately \$9.6 million, or approximately \$0.78 per share. This amount represents an immediate increase in pro forma net tangible book value of approximately \$0.03 per share to our existing stockholders and an immediate dilution in net tangible book value of approximately \$0.24 per share to new investors purchasing shares of common stock in this offering.

Dilution per share to new investors is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the offering price per share paid by new investors. The following table illustrates this dilution:

Assumed public offering price per share	\$1.02
Net tangible book value per share as of September 30, 2023	\$0.67
Increase in net tangible book value per share attributable to the issuance of 1,135,940 shares of common stock after September 30, 2023 pursuant to the Sales Agreement between November 2023 and January 2024	\$0.07
Pro forma net tangible book value per share as of September 30, 2023	\$0.75
Increase in pro forma net tangible book value per share attributable to this offering	\$0.03
Pro forma as adjusted net tangible book value per share, after giving effect to this offering	\$0.78
Dilution per share to investors purchasing shares in this offering	\$0.24

* Per share numbers may not add due to rounding

The table above assumes for illustrative purposes that an aggregate of 2,554,635 shares of our common stock are sold during the term of the Sales Agreement with the Agents at a price of \$1.02 per share, the last reported sale price of our common stock on the Nasdaq Capital Market on January 23, 2024, for aggregate gross proceeds of \$2,605,728. The shares sold in this offering, if any, will be sold from time to time at various prices. This information is supplied for illustrative purposes only.

The information and table above are based on 8,719,453 shares of common stock outstanding as of September 30, 2023 and exclude the following, all as of September 30, 2023:

- 850,114 shares of common stock issuable upon the exercise of stock options outstanding at a weighted average exercise price of approximately \$5.05 per share;
- 125,142 shares of common stock issuable upon the vesting and settlement of outstanding restricted stock units;
- 1,000 shares of common stock available for issuance pursuant to the Inducement Plan;
- 1,672,574 shares of common stock available for issuance pursuant to the 2022 Plan; and
- 58,426 shares of common stock available for issuance pursuant to the 2016 Employee Stock Purchase Plan.

To the extent options, restricted units or warrants are additionally exercised or settled or other shares are issued, there may be further dilution to investors. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders. The information above also excludes 45,000 shares of common stock available for issuance pursuant to the Organovo Holdings, Inc. 2023 Employee Stock Purchase Plan that was approved by our stockholders on October 31, 2023.

PLAN OF DISTRIBUTION

We have entered into a Sales Agreement (the “Sales Agreement”) with H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC (each an “Agent” and together, the “Agents”) under which we may offer and sell shares of our common stock from time to time through the Agents. The Sales Agreement has been filed as an exhibit to a Current Report on Form 8-K and incorporated by reference into this prospectus.

Upon delivery of a placement notice and subject to the terms and conditions of the Sales Agreement, the Agents may sell shares of our common stock, if any, under this prospectus, may be made in sales deemed to be an “at the market offering” as defined in Rule 415(a)(4) promulgated under the Securities Act. We or the Agents may suspend the offering of our common stock upon notice and subject to other conditions.

We will pay the Agents commissions, in cash, for their services in acting as agents in the sale of our common stock. The Agents will be entitled to compensation under the terms of the Sales Agreements at a commission rate of up to 3.0% of the gross sales price per share sold. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. We also previously reimbursed each of the Agents for certain specified expenses, including \$50,000 in fees and disbursements of their legal counsel. We estimate that the total expenses for the offering, excluding compensation and reimbursements payable to the Agents under the terms of the Sales Agreement, will be approximately \$200,000.

Settlement for sales of common stock will occur on the second business day following the date on which any sales are made, or on some other date that is agreed upon by us and the applicable Agent in connection with a particular transaction or as otherwise required by law, in return for payment of the net proceeds to us. Sales of our common stock as contemplated in this prospectus will be settled through the facilities of The Depository Trust Company or by such other means as we and the Agents may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

The Agents will use their respective commercially reasonable efforts, consistent with their respective sales and trading practices, to solicit offers to purchase the shares of common stock under the terms and subject to the conditions set forth in the Sales Agreement. In connection with the sale of the common stock on our behalf, each Agent will be deemed to be an “underwriter” within the meaning of the Securities Act and the compensation of the Agents will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to the Agents against certain civil liabilities, including liabilities under the Securities Act.

The offering of our common stock pursuant to the Sales Agreement will terminate upon the termination of the Sales Agreement as permitted therein. We and the Agents may each terminate the Sales Agreement at any time upon five days’ prior notice.

The Agents and their respective affiliates may in the future provide various investment banking, commercial banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees. To the extent required by Regulation M, the Agents will not engage in any market making activities involving our common stock while the offering is ongoing under this prospectus.

This prospectus in electronic format may be made available on websites maintained by the respective Agents, and the Agents may distribute this prospectus electronically.

LEGAL MATTERS

The validity of the shares of common stock being offered by this prospectus will be passed upon for us by Paul Hastings LLP, Palo Alto, California. H.C. Wainwright & Co., LLC and JonesTrading Institutional Services LLC are being represented in connection with this offering by Duane Morris LLP, New York, New York.

EXPERTS

The consolidated financial statements of Organovo Holdings, Inc. (“Company”) as of and for the years ended March 31, 2023 and 2022, appearing in the Company’s Annual Report on Form 10-K for the year ended March 31, 2023, have been audited by Mayer Hoffman McCann P.C., independent registered public accounting firm, as set forth in their report (which report includes an explanatory paragraph regarding the existence of substantial doubt about the Company’s ability to continue as a going concern), and have been incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing, in giving said reports.

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WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement on Form S-3 under the Securities Act with respect to the securities being offered under this prospectus. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement and the exhibits to the registration statement. For further information with respect to us and the securities being offered under this prospectus, we refer you to the registration statement of which this prospectus is a part and the exhibits and schedules filed as a part of the registration statement. Statements contained in this prospectus as to the contents of any contract or any other document are not necessarily complete. If a contract or document has been filed as an exhibit to the registration statement or an exhibit to the reports or other documents incorporated by reference into this prospectus, please see the copy of the contract or document that has been filed. Each statement in this prospectus relating to a contract or document filed as an exhibit is qualified in all respects by the filed exhibit.

The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including Organovo Holdings, Inc. The SEC's Internet site can be found at <http://www.sec.gov>. You may also request a copy of these filings, at no cost, by writing us at 11555 Sorrento Valley Road, Suite 100, San Diego, CA 92121 or telephoning us at (858) 224-1400.

We are subject to the information and reporting requirements of the Exchange Act and, in accordance with this law, file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information are available at the website of the SEC referred to above. We also maintain a website at www.jaspertherapeutics.com. You may access these materials free of charge as soon as reasonably practicable after they are electronically filed with, or furnished to, the SEC. Information contained on or connected to our website is not a part of, and is not incorporated into, this prospectus and the inclusion of our website address in this prospectus is an inactive textual reference only.

INCORPORATION OF DOCUMENTS BY REFERENCE

The SEC allows us to “incorporate by reference” information into this prospectus, which means that we can disclose important information to you by referring you to another document filed separately with the SEC. The documents incorporated by reference into this prospectus contain important information that you should read about us.

The following documents are incorporated by reference into this prospectus:

- Our Annual Report on Form 10-K for the fiscal year ended March 31, 2023, filed with the SEC on [July 14, 2023](#), as amended by Amendment No. 1 on Form 10-K/A, filed with the SEC on [July 31, 2023](#);
- Our Quarterly Report on Form 10-Q for the quarterly period ended June 30, 2023, filed with the SEC on [August 10, 2023](#);
- Our Quarterly Report on Form 10-Q for the quarterly period ended September 30, 2023, filed with the SEC on [November 9, 2023](#);
- Our Current Reports on Form 8-K filed with the SEC on [July 24, 2023](#), [August 22, 2023](#), [September 5, 2023](#), [September 12, 2023](#), [November 3, 2023](#), and [December 28, 2023](#);
- Our Current Report on Form 8-K/A filed with the SEC on [September 22, 2023](#); and
- The description of our common stock set forth in our Registration Statement on Form 8-A (File No. 001-35996), filed with the SEC on [July 26, 2016](#), including any amendments or reports filed for the purpose of updating such description, including the description of our common stock included as [Exhibit 4.1](#) to our Annual Report on Form 10-K for the fiscal year ended March 31, 2023, filed with the SEC on [July 14, 2023](#), as amended by Amendment No. 1 on Form 10-K/A, filed with the SEC on [July 31, 2023](#).

We also incorporate by reference any future filings (other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items unless such Form 8-K expressly provides to the contrary) made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, including those made after the date of the initial filing of the registration statement of which this prospectus is a part and prior to effectiveness of such registration statement, until we file a post-effective amendment that indicates the termination of the offering of the securities made by this prospectus and such future filings and will become a part of this prospectus from the respective dates that such documents are filed with the SEC. Any statement contained herein or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes hereof or of the related prospectus supplement to the extent that a statement contained herein or in any other subsequently filed document which is also incorporated or deemed to be incorporated by reference herein modifies or supersedes such statement. Any such statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

You may obtain any of the documents incorporated by reference in this prospectus from the SEC through the SEC’s website at the address provided above. Documents incorporated by reference are also available from us, without charge. You may obtain documents incorporated by reference in this prospectus by requesting them in writing or by telephone at the following address or phone number:

Organovo Holdings, Inc.
11555 Sorrento Valley Road, Suite 100
San Diego, CA 92121
Attn: Corporate Secretary
Phone: (858) 224-1000



Up to \$2,605,728

Common Stock

PROSPECTUS

H.C. Wainwright & Co.

JonesTrading

February 8, 2024
