

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549**

**FORM S-8
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

ORGANOVO HOLDINGS, INC.
(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

27-1488943
(I.R.S. Employer
Identification No.)

**6275 Nancy Ridge Drive, Suite 110
San Diego, California 92121**
(Address of Principal Executive Offices)(Zip Code)

Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan
(Full titles of the plans)

Keith Murphy
Chairman, Chief Executive Officer and President
Organovo Holdings, Inc.
6275 Nancy Ridge Drive, Suite 110
San Diego, California 92121
(858) 550-9994

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

Jeffrey C. Thacker, Esq.
Ryan J. Gunderson, Esq.
Gunderson Dettmer Stough Villeneuve
Franklin & Hachigian, LLP
3570 Carmel Mountain Rd., Suite 200
San Diego, CA 92130
Tel: (858) 436-8000

(Copy to)

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

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of securities to be registered	Amount to be registered (1)	Proposed maximum offering price per share (2)	Proposed maximum aggregate offering price (2)	Amount of registration fee
Common stock, par value \$0.001 per share 2016 Employee Stock Purchase Plan	1,500,000	\$3.43	\$5,145,000	\$518.10

- (1) Represents shares of common stock reserved for issuance under the Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan (the "Plan"). In addition, pursuant to Rule 416(c) under the Securities Act of 1933, as amended (the "Securities Act"), this registration statement shall also cover any additional securities that may be necessary to adjust the number of shares reserved for issuance pursuant to the Plan by reason of any stock split, stock dividend or similar adjustment effected without the Registrant's receipt of consideration that results in an increase in the number of the Registrant's outstanding shares of common stock.
- (2) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457 under the Securities Act. The proposed maximum offering price per share, proposed maximum aggregate offering price and the amount of the registration fee are based on the average of the high and low prices of Registrant's common stock on the Nasdaq Stock Market on August 23, 2016 of \$4.04 multiplied by 85%. Pursuant to the Plan, the purchase price of a share of common stock is 85% of the fair market value per share of the Registrant's common stock.

This registration statement shall become effective upon filing in accordance with Rule 462 under the Securities Act.

INTRODUCTORY NOTES

This Registration Statement on Form S-8 registers shares of the Registrant's common stock that may be offered or issued to the Registrant's employees under the terms of the Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan (the "Plan"). On August 17, 2016, the Registrant held its annual meeting of stockholders, at which the Registrant's stockholders approved the Plan, including the number of shares of common stock that may be issued under the Plan of 1,500,000 shares.

PART I

INFORMATION REQUIRED IN THE SECTION 10(a) PROSPECTUS

As permitted by the rules of the Securities and Exchange Commission (the "Commission"), this registration statement omits the information specified in Part I of Form S-8. The documents containing the information specified in Part I will be delivered to the participants in the Plan covered by this registration statement as required by Rule 428(b) promulgated under the Securities Act. Such documents are not being filed with the Commission as part of this registration statement or as prospectuses or prospectus supplements pursuant to Rule 424 of the Securities Act. Such documents and the documents incorporated by reference in this registration statement pursuant to Item 3 of Part II hereof, taken together, constitute a prospectus that meets the requirements of Section 10(a) of the Securities Act.

PART II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The following documents filed with the Commission by the Registrant are incorporated by reference in this registration statement:

- (a) The Registrant's latest annual report on Form 10-K filed pursuant to Sections 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), containing audited financial statements for the Registrant's fiscal year ended March 31, 2016 as filed with the Commission on June 9, 2016;
- (b) The Registrant's quarterly report on Form 10-Q for its fiscal quarter ended June 30, 2016 filed with the Commission on August 4, 2016;
- (c) The Registrant's current reports on Form 8-K filed with the Commission on April 5, 2016, July 8, 2016, July 20, 2016, July 26, 2016, August 2, 2016 and August 18, 2016;
- (d) The Registrant's definitive proxy statement on Schedule 14A filed with the Commission on July 8, 2016; and
- (f) The description of the Registrant's common stock contained in the Registrant's Registration Statement on Form 8-A as filed with the SEC on July 9, 2013 (File No. 001-35996) pursuant to Section 12(b) of the Exchange Act.

All documents subsequently filed by the Registrant pursuant to Sections 13(a), 13(c), 14 and 15(d) of the Exchange Act prior to the filing of a post-effective amendment which indicates that all securities offered hereby have been sold or which deregisters all securities then remaining unsold, shall be deemed to be incorporated by reference in this registration statement and to be part hereof from the date of filing of such reports and other documents, except as to any portion of any such report or other document furnished under current Items 2.02 or 7.01 of Form 8-K that is not deemed filed under such provisions.

For the purposes of this registration statement, any statement contained in a report or document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded to the extent that a statement contained herein or in any other subsequently filed document which also is or is 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 registration statement.

Item 4. Description of Securities.

Not applicable.

Item 5. Interests of Named Experts and Counsel.

Not applicable.

Item 6. Indemnification of Directors and Officers.

Under Section 145 of the General Corporation Law of the State of Delaware, we may indemnify our directors and officers against liabilities they may incur in such capacities, including liabilities under the Securities Act. Our certificate of incorporation provides that, pursuant to Delaware law, our directors shall not be liable for monetary damages for breach of the directors' fiduciary duty of care to us and our stockholders. This provision does not eliminate the duty of care, and in appropriate circumstances equitable remedies such as injunctive or other forms of non-monetary relief will remain available under Delaware law. In addition, each director will continue to be subject to liability for breach of the director's duty of loyalty to us or our stockholders for acts or omissions not in good faith or involving intentional misconduct or knowing violations of the law, for actions leading to improper personal benefit to the director, and for payment of dividends or approval of stock repurchases or redemptions that are unlawful under Delaware law. The provision also does not affect a director's responsibilities under any other law, such as the federal securities laws or state or federal environmental laws.

Our bylaws provide for the indemnification of its directors to the fullest extent permitted by the Delaware General Corporation Law. Our bylaws further provide that our Board of Directors has discretion to indemnify our officers and other employees. We are required to advance, prior to the final disposition of any proceeding, promptly on request, all expenses incurred by any director or executive officer in connection with that proceeding on receipt of an undertaking by or on behalf of that director or executive officer to repay those amounts if it should be determined ultimately that he or she is not entitled to be indemnified under our bylaws or otherwise. We are not, however, required to advance any expenses in connection with any proceeding if a determination is reasonably and promptly made (i) by a majority vote of the directors who are not parties to such proceeding, even though less than a quorum, or (ii) by a committee of such directors designated by majority vote of such directors, even though less than a quorum, or (iii) if there are no such directors, or if such directors so direct, by independent legal counsel in a written opinion, that facts known to the decision-making party at the time such determination is made demonstrate clearly and convincingly that such person acted in bad faith or in a manner that such person did not believe to be in or not opposed to the best interests of the corporation.

In addition, we have entered into indemnification agreements with each of our executive officers and directors. We also maintain an officers and directors liability insurance policy.

The foregoing may reduce the likelihood of derivative litigation against our directors and executive officers and may discourage or deter stockholders or management from suing directors or executive officers for breaches of their duty of care, even though such actions, if successful, might otherwise benefit the company and our stockholders.

We have been advised that in the opinion of the Commission indemnification for liabilities arising under the Securities Act 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 is asserted by one of our directors, officers, or controlling persons in connection with the securities being registered, we will, unless in the opinion of our legal counsel the matter has been settled by controlling precedent, submit the question of whether such indemnification is against public policy to a court of appropriate jurisdiction. We will then be governed by the court's decision.

Item 7. Exemption From Registration Claimed.

Not applicable.

Item 8. Exhibits.

The following is a list of exhibits filed as part of this registration statement, which are incorporated herein:

<u>Exhibit No.</u>	<u>Description</u>
4.1	Certificate of Incorporation (incorporated by reference from Exhibit 3.1 to Form 8-K filed on February 3, 2012)
4.2	Bylaws of Organovo Holdings, Inc. (Delaware) (incorporated by reference from Exhibit 3.2 to Form 8-K filed on February 3, 2012)
4.3	Form of Bridge Warrant of Organovo, Inc. (incorporated by reference from Exhibit 4.1 to the Company's Current Report on Form 8-K, as filed with the SEC on February 13, 2012)
4.4	Form of Warrant of Organovo Holdings, Inc. (\$1.00 exercise price) issued to Placement Agent (incorporated by reference from Exhibit 4.2(i) to the Company's Current Report on Form 8-K, as filed with the SEC on March 19, 2012)
4.5	Form of Warrant of Organovo Holdings, Inc. (\$1.00 exercise price) issued to Placement Agent in exchange for Organovo, Inc. warrant issued to Selling Agent (incorporated by reference from Exhibit 4.2(iii) to the Company's Current Report on Form 8-K, as filed with the SEC on March 19, 2012)
5.1	Opinion of Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP
23.1	Consent of Independent Registered Public Accounting Firm
23.2	Consent of Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP (filed as a part of Exhibit 5.1)
24.1	Power of Attorney (contained on signature page)
99.1	Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan (incorporated by reference from Exhibit 10.1 to Form 8-K filed on August 18, 2016)

Item 9. Undertakings.

(a) The undersigned Registrant hereby undertakes:

(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;

(ii) To reflect in the prospectus any facts or events arising after the effective date of this 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 this Registration Statement;

(iii) To include any material information with respect to the plan of distribution not previously disclosed in this Registration Statement or any material change to such information in this Registration Statement;

Provided, however, that paragraphs (a)(1)(i) and (a)(1)(ii) 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 Exchange Act that are incorporated by reference in this Registration Statement.

(2) That, for the purpose 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 that 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.

(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 this 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.

(h) 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 foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the Commission 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 the 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.

SIGNATURES

Pursuant to the requirements of the Securities Act, the Registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of San Diego, State of California, on this 26th day of August, 2016.

ORGANOVO HOLDINGS, INC.

By: /s/ Keith Murphy
Keith Murphy
Chairman, Chief Executive Officer and President

POWER OF ATTORNEY

KNOW ALL PERSONS BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Keith Murphy and Craig Kussman, and each of them individually, as the undersigned's true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution, for the undersigned and in the undersigned's name, place, and stead, in any and all capacities, to sign any and all amendments to this Report, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as the undersigned might or could do in person, hereby ratifying and confirming that all said attorneys-in-fact and agents, or any of them or their respective substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act, this registration statement has been signed by the following persons in the capacities and on the date indicated:

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>/s/ Keith Murphy</u> Keith Murphy	President, Chief Executive Officer and Director <i>(Principal Executive Officer)</i>	August 26, 2016
<u>/s/ Craig Kussman</u> Craig Kussman	Chief Financial Officer <i>(Principal Financial and Accounting Officer)</i>	August 26, 2016
<u>/s/ Robert Baltera, Jr.</u> Robert Baltera, Jr.	Director	August 26, 2016
<u>/s/ James Glover</u> James Glover	Director	August 26, 2016
<u>/s/ Tamar Howson</u> Tamar Howson	Director	August 26, 2016
<u>/s/ Mark Kessel</u> Mark Kessel	Director	August 26, 2016
<u>/s/ Kirk Malloy</u> Kirk Malloy	Director	August 26, 2016
<u>/s/ Richard Maroun</u> Richard Maroun	Director	August 26, 2016

EXHIBIT INDEX

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SILICON VALLEY
ANN ARBOR
BEIJING
BOSTON
LOS ANGELES
NEW YORK
SAN DIEGO
SAN FRANCISCO

August 26, 2016

Organovo Holdings, Inc.
6275 Nancy Ridge Drive, Suite 110
San Diego, CA 92121

Re: Registration Statement on Form S-8
Relating to 1,500,000 Shares of Common Stock

Ladies and Gentlemen:

We refer to the registration statement on Form S-8 (the "Registration Statement") to be filed by Organovo Holdings, Inc., a Delaware corporation (the "Company"), in connection with the registration under the Securities Act of 1933, as amended (the "Act"), of an aggregate of 1,500,000 shares of the Company's common stock, \$0.001 par value per share (the "Shares") issuable under the Organovo Holdings, Inc. 2016 Employee Stock Purchase Plan (the "Plan").

In connection with this opinion, we have reviewed the actions proposed to be taken by you in connection with the issuance and sale of the Shares to be issued under the Plan. We have also examined and relied upon the Registration Statement and the originals or copies certified to our satisfaction of such other documents, records, certificates, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. With your consent, we have relied upon certificates and other assurances of officers of the Company as to factual matters without having independently verified such factual matters. We have assumed the genuineness and authenticity of all documents submitted to us as originals, and the conformity to originals of all documents submitted to us as copies thereof and the due execution and delivery of all documents where due execution and delivery are a prerequisite to the effectiveness thereof.

This opinion is being furnished in connection with the requirements of Item 601(b)(5) of Regulation S-K under the Act, and no opinion is expressed herein as to any matter pertaining to the contents of the Registration Statement, other than as expressly stated herein with respect to the issuance of the Shares. Our opinion is limited to the matters stated herein and no opinion is implied or may be inferred beyond the matters expressly stated. Our opinion herein is expressed solely with respect to the federal laws of the United States and the General Corporation Law of the State of Delaware (the "DGCL"). Our opinion is based on these laws as in effect on the date hereof, and we disclaim any obligation to advise you of facts, circumstances, events or developments which hereafter may be brought to our attention and which may alter, affect or modify the opinion expressed herein. We are not rendering any opinion as to compliance with any federal or state antifraud law, rule or regulation relating to securities, or to the sale or issuance thereof.

Based upon and subject to the foregoing, we advise you that, in our opinion, when the Shares have been issued and sold by the Company pursuant to the applicable provisions of the Plan and in accordance with the Registration Statement, such Shares will be validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement. In giving such consent, we do not thereby admit that we are in the category of persons whose consent is required under Section 7 of the Act or the rules and regulations of the Commission thereunder.

Very truly yours,

/s/ Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP

GUNDERSON DETTMER STOUGH VILLENEUVE FRANKLIN & HACHIGIAN, LLP

GUNDERSON DETTMER STOUGH VILLENEUVE FRANKLIN & HACHIGIAN, LLP
3570 CARMEL MOUNTAIN ROAD, SUITE 200, SAN DIEGO, CA 92130 / PHONE: 858.436.8000 / FAX: 877.881.9192

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in this Registration Statement on Form S-8 of our report dated June 9, 2016, relating to the consolidated financial statements of Organovo Holdings, Inc. and Subsidiaries, appearing in the Annual Report on Form 10-K, for the year ended March 31, 2016.

/s/ Mayer Hoffman McCann P.C.

San Diego, California
August 26, 2016