UNITED STATES SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM S-8 REGISTRATION STATEMENT UNDER

THE SECURITIES ACT OF 1933

HARVARD BIOSCIENCE, INC.

(Exact name of registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)

84 October Hill Road Holliston, MA (Address of Principal Executive Offices) 04-3306140 (IRS Employer Identification No.)

> 01746 (Zip Code)

HARVARD BIOSCIENCE, INC. EMPLOYEE STOCK PURCHASE PLAN (Full title of the plan)

David Green President and Chief Executive Officer Harvard Bioscience, Inc. 84 October Hill Road, Holliston, MA 01746 (Name and address of agent for service)

(508) 893-8999 (Telephone number, including area code, of agent for service)

With copies to:

Josef B. Volman, Esq. Chad J. Porter, Esq. Burns & Levinson LLP 125 Summer Street Boston, Massachusetts 02110 (617) 345-3000

| ndicate 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 efinitions 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 | X | |
| Non-accelerated filer | \Box (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 | Proposed maximum aggregate offering price | Amount of registration fee |
|--|----------------------------------|--|--|-------------------------------|
| Common Stock, \$0.01 par value per share | 250,000(2) | \$5.06(3) | \$1,265,000(3) | \$172.55 |

(1) In accordance with Rule 416 under the Securities Act of 1933, as amended, this Registration Statement shall be deemed to cover any additional securities that may from time to time be offered or issued to prevent dilution resulting from stock splits, stock dividends or similar transactions.

(2) Consists of 250,000 shares issuable under the Registrant's Employee Stock Purchase Plan.

(3) Estimated in accordance with Rule 457(h) under the Securities Act of 1933, as amended, solely for the purpose of calculating the registration fee. Such computation is based on the average of the high and low prices of the Registrant's common stock as reported on THE NASDAQ Global Market on June 3, 2013.

EXPLANATORY NOTE

This Registration Statement is filed by Harvard Bioscience, Inc. (the "Registrant") for the purpose of registering pursuant to General Instruction E to Form S-8, 250,000 additional shares of the Registrant's common stock, \$0.01 par value per share (the "Common Stock") under Amendment No. 2 to Harvard Bioscience, Inc. Employee Stock Purchase Plan (the "ESPP"). On April 12, 2013, the Registrant filed with the Securities and Exchange Commission (the "Commission") a definitive proxy statement that included proposals to, among other things, increase the number of shares available for issuance under the ESPP by 250,000 shares of Common Stock. The proposal to increase the number of shares available for issuance under the ESPP. stockholders on May 23, 2013. This Registration Statement registers the 250,000 additional shares of Common Stock available for issuance under the ESPP.

The additional 250,000 shares of Common Stock available for issuance under the ESPP registered pursuant to this Registration Statement are the same class as those included on registration statements on Form S-8 filed on June 15, 2001 (File No. 333-53848) and January 17, 2001 (File No. 333-53848). The contents of all aforementioned Registration Statements, including any amendments thereto or filings incorporated therein, are incorporated herein by reference, expect as modified herein.

PART II INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 3. Incorporation of Documents by Reference.

The registrant is subject to the informational and reporting requirements of Sections 13(a), 14 and 15(d) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and in accordance therewith files reports, proxy statements and other information with the Commission. The following documents, which are on file with the Commission, are incorporated in this registration statement by reference:

(a) The Registrant's Annual Report on Form 10-K for the year ended December 31, 2012, filed with the Commission on March 18, 2013;

(b) All other reports filed by the Registrant pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act, since the end of the fiscal year covered by the Registrant's Annual Report on Form 10-K described in (a) above; and

(c) The description of the Registrant's Common Stock contained in the Registrant's registration statement on Form 8-A (File No. 000-31923) filed with the Commission on November 9, 2000 under the Exchange Act, including any amendment or report filed for the purpose of updating such description.

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 posteffective 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 the filing of such documents. Any statement contained in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for the purposes of this Registration Statement 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 statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this Registration Statement.

Item 8. Exhibits.

The exhibits listed below represent a complete list of exhibits filed or incorporated by reference as part of this Registration Statement.

| Exhibit <u>Number</u> | Description | | |
|--------------------------|---|--|--|
| (1)3.1 | Second Amended and Restated Certificate of Incorporation of Harvard Bioscience, Inc. | | |
| (1)3.2 | Amended and Restated Bylaws of Harvard Bioscience, Inc. | | |
| (2)3.3 | Amendment No. 1 to Amended and Restated Bylaws of Harvard Bioscience, Inc. (as adopted October 30, 2007) | | |
| (1)4.1 | Specimen certificate for shares of Common Stock, \$0.01 par value, of Harvard Bioscience, Inc. | | |
| (1)4.2 | Amended and Restated Securityholders' Agreement dated as of March 2, 1999 by and among Harvard Apparatus, Inc., Pioneer Partnership II, Pioneer Capital Corp., First New England Capital, L.P. and Citizens Capital, Inc. and Chane Graziano and David Green | | |
| (3)4.3 | Shareholder Rights Agreement, dated as of February 5, 2008 between Harvard Bioscience, Inc., and Registrar and Transfer Company, as Rights Agent | | |
| *4.4 | Harvard Bioscience, Inc. Employee Stock Purchase Plan, as amended | | |
| *5.1 | Legal opinion from Burns & Levinson LLP | | |
| *23.1 | Consent of KPMG LLP, as independent registered public accounting firm | | |
| 23.2 | Consent of Burns & Levinson LLP (contained in the opinion filed as Exhibit 5.1 to this Registration Statement) | | |
| 24.1 | Power of attorney (included on the signature page to this Registration Statement) | | |
| * Filed herewith. | | | |

(1) Previously filed as an exhibit to the Company's Registration Statement on Form S-1 (File No. 333-45996) and incorporated by reference thereto.

(2) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on November 1, 2007) and incorporated by reference thereto.

(3) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on February 8, 2008) and incorporated by reference thereto.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, 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 Holliston, Commonwealth of Massachusetts, on this 7th day of June, 2013.

HARVARD BIOSCIENCE, INC.

By: /s/ David Green

David Green

President and Chief Executive Officer

POWER OF ATTORNEY AND SIGNATURES

KNOW ALL PERSONS BY THESE PRESENTS that each individual whose signature appears below constitutes and appoints David Green and Thomas McNaughton, and each of them, his true and lawful attorneys-in-fact and agents with full power of substitution, and each of them singly, to sign for us and in our names in the capacities indicated below, the registration statement on Form S-8 filed herewith and any and all subsequent amendments to said registration statement, and generally to do all such things in our names and on our behalf in our capacities as officers and directors to enable Harvard Bioscience, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, hereby ratifying and confirming our signatures as they may be signed by our said attorneys, or any of them, to said registration statement and any and all amendments thereto.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

| /s/ David Green David Green | Director and Chief Executive Officer (Principal Executive Officer) | June 7, 2013 |
|--|--|--------------|
| /s/ Thomas McNaughton Thomas McNaughton | Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer) | June 7, 2013 |
| /s/ Robert Dishman Robert Dishman | Director | June 7, 2013 |
| /s/ Neal J. Harte Neal J. Harte | Director | June 7, 2013 |
| /s/ John F. Kennedy John F. Kennedy | Director | June 7, 2013 |
| /s/ Earl R. Lewis Earl R. Lewis | Director | June 7, 2013 |
| /s/ George Uveges George Uveges | Director | June 7, 2013 |

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HARVARD BIOSCIENCE, INC. EMPLOYEE STOCK PURCHASE PLAN

(As Amended)

The purpose of the Harvard Bioscience, Inc. Employee Stock Purchase Plan ("the Plan") is to provide eligible employees of Harvard Bioscience, Inc. (the "Company") and certain of its subsidiaries with opportunities to purchase shares of the Company's common stock, par value \$.01 per share (the "Common Stock"). Seven hundred fifty thousand (750,000) shares of Common Stock in the aggregate have been approved and reserved for this purpose. The Plan is intended to constitute an "employee stock purchase plan" within the meaning of Section 423(b) of the Internal Revenue Code of 1986, as amended (the "Code"), and shall be interpreted in accordance with that intent.

1. ADMINISTRATION. The Plan will be administered by the person or persons (the "Administrator") appointed by the Company's Board of Directors (the "Board") for such purpose. The Administrator has authority to make rules and regulations for the administration of the Plan, and its interpretations and decisions with regard thereto shall be final and conclusive. No member of the Board or individual exercising administrative authority with respect to the Plan shall be liable for any action or determination made in good faith with respect to the Plan or any option granted hereunder.

2. OFFERINGS. The Company will make one or more offerings to eligible employees to purchase Common Stock under the Plan ("Offerings"). Unless otherwise determined by the Administrator, the initial Offering will begin on January 1, 2001 and will end on June 30, 2001 (the "Initial Offering"). Thereafter, unless otherwise determined by the Administrator, an Offering will begin on the first business day occurring on or after each January 1 and July 1 and will end on the last business day occurring on or before the following June 30 and December 31, respectively. The Administrator may, in its discretion, designate a different period for any Offering, provided that no Offering shall exceed six months in duration or overlap any other Offering.

3. ELIGIBILITY. All employees of the Company (including employees who are also directors of the Company) and all employees of each Designated Subsidiary (as defined in Section 11) are eligible to participate in any one or more of the Offerings under the Plan, provided that as of the first day of the applicable Offering (the "Offering Date") they are customarily employed by the Company or a Designated Subsidiary for more than 20 hours a week.

4. PARTICIPATION. An employee eligible on any Offering Date may participate in such Offering by submitting an enrollment form to his appropriate payroll location at least 15 business days before the Offering Date (or by such other deadline as shall be established for the Offering). The form will (a) state a whole percentage to be deducted from his Compensation (as defined in Section 11) per pay period, (b) authorize the purchase of Common Stock for him in each Offering in accordance with the terms of the Plan and (c) specify the exact name or names in which shares of Common Stock purchased for him are to be issued pursuant to Section 10. An employee who does not enroll in accordance with these procedures will be deemed to have waived his right to participate. Unless an employee files a new enrollment form or withdraws from the Plan, his deductions and purchases will continue at the same percentage of Compensation for future Offerings, provided he remains eligible.

Notwithstanding the foregoing, participation in the Plan will neither be permitted nor be denied contrary to the requirements of the Code.

5. EMPLOYEE CONTRIBUTIONS. Each eligible employee may authorize payroll deductions at a minimum of one percent (1%) up to a maximum of ten percent (10%) of his Compensation for each pay period. The Company will maintain book accounts showing the amount of payroll deductions made by each participating employee for each Offering. No interest will accrue or be paid on payroll deductions.

6. DEDUCTION CHANGES. Except as may be determined by the Administrator in advance of an Offering, an employee may not increase or decrease his payroll deduction during any Offering, but may increase or decrease his payroll deduction with respect to the next Offering (subject to the limitations of Section 5) by filing a new enrollment form at least 15 business days before the next Offering Date (or by such other deadline as shall be established for the Offering). The Administrator may, in advance of any Offering, establish rules permitting an employee to increase, decrease or terminate his payroll deduction during an Offering.

7. WITHDRAWAL. An employee may withdraw from participation in the Plan by delivering a written notice of withdrawal to his appropriate payroll location. The employee's withdrawal will be effective as of the next business day. Following an employee's withdrawal, the Company will promptly refund to him his entire account balance under the Plan (after payment for any Common Stock purchased before the effective date of withdrawal). Partial withdrawals are not permitted. The employee may not begin participation again during the remainder of the Offering, but may enroll in a subsequent Offering in accordance with Section 4.

8. GRANT OF OPTIONS. On each Offering Date, the Company will grant to each eligible employee who is then a participant in the Plan an option ("Option") to purchase on the last day of such Offering (the "Exercise Date"), at the Option Price hereinafter provided for, (a) a number of shares of Common Stock, which number shall not exceed the number of whole shares which is less than or equal to \$12,500 divided by the closing price per share of Common Stock on the Offering Date, or (b) such other lesser maximum number of shares as shall have been established by the Administrator in advance of the Offering. The purchase price for each share purchased under each Option (the "Option Price") will be 85% of the Fair Market Value of the Common Stock on the Offering Date or the Exercise Date, whichever is less.

Notwithstanding the foregoing, no employee may be granted an option hereunder if such employee, immediately after the option was granted, would be treated as owning stock, possessing five percent (5%) or more of the total combined voting power or value of all classes of stock of the Company or any Parent or Subsidiary (as defined in Section 11). For purposes of the preceding sentence, the attribution rules of Section 424(d) of the Code shall apply in determining the stock ownership of an employee, and all stock which the employee has a contractual right to purchase shall be treated as stock owned by the employee. In addition, no employee may be granted an Option which permits his rights to purchase stock under the Plan, and any other employee stock purchase plan of the Company and its Parents and Subsidiaries, to accrue at a rate which exceeds \$25,000 of the fair market value of such stock (determined on the option grant date or dates) for each calendar year in which the Option is outstanding at any time. The purpose of the limitation in the preceding sentence is to comply with Section 423(b)(8) of the Code.

9. EXERCISE OF OPTION AND PURCHASE OF SHARES. Each employee who continues to be a participant in the Plan on the Exercise Date shall be deemed to have exercised his Option on such date and shall acquire from the Company such number of whole shares of Common Stock reserved for the purpose of the Plan as his accumulated payroll deductions on such date will purchase at the Option Price, subject to any other limitations contained in the Plan. Any amount remaining in an employee's account at the end of an Offering solely by reason of the inability to purchase a fractional share will be carried forward to the next Offering; any other balance remaining in an employee's account at the end of an Offering will be refunded to the employee promptly.

10. ISSUANCE OF CERTIFICATES. Certificates representing shares of Common Stock purchased under the Plan may be issued only in the name of the employee, in the name of the employee and another person of legal age as joint tenants with rights of survivorship, or in the name of a broker authorized by the employee to be his, or their, nominee for such purpose.

11. DEFINITIONS.

The term "Compensation" means the amount of an employee's base pay from the Company prior to any reduction for deferrals made under either Code Section 125 or 401(k), <u>including</u> commissions, but <u>excluding</u> overtime, incentive or bonus awards, allowances and reimbursements for expenses such as relocation allowances or travel expenses, income or gains on the exercise of Company stock options, and similar extraordinary items.

The term "Designated Subsidiary" means any present or future Subsidiary (as defined below) that has been designated by the Board to participate in the Plan. The Board may so designate any Subsidiary, or revoke any such designation, at any time and from time to time, either before or after the Plan is approved by the stockholders.

The term "Fair Market Value of the Common Stock" on any given date means the fair market value of the Common Stock determined in good faith by the Administrator; PROVIDED, HOWEVER, that if the Common Stock is admitted to quotation on the National Association of Securities Dealers Automated Quotation System ("Nasdaq"), Nasdaq National System or national securities exchange, the determination shall be made by reference to market quotations. If there are no market quotations for such date, the determination shall be made by reference to the last date preceding such date for which there are market quotations.

The term "Initial Public Offering" means the consummation of the first fully underwritten, firm commitment public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, other than on Forms S-4 or S-8 or their then equivalents, covering the offer and sale by the Company of its Common Stock.

The term "Parent" means a "parent corporation" with respect to the Company, as defined in Section 424(e) of the Code.

The term "Subsidiary" means a "subsidiary corporation" with respect to the Company, as defined in Section 424(f) of the Code.

12. RIGHTS ON TERMINATION OF EMPLOYMENT. If a participating employee's employment terminates for any reason before the Exercise Date for any Offering, no payroll deduction will be taken from any pay due and owing to the employee and the balance in his account will be paid to him or, in the case of his death, to his designated beneficiary as if he had withdrawn from the Plan under Section 7. An employee will be deemed to have terminated employment, for this purpose, if the corporation that employs him, having been a Designated Subsidiary, ceases to be a Subsidiary, or if the employee is transferred to any corporation other than the Company or a Designated Subsidiary.

13. SPECIAL RULES. Notwithstanding anything herein to the contrary, the Administrator may adopt special rules applicable to the employees of a particular Designated Subsidiary, whenever the Administrator determines that such rules are necessary or appropriate for the implementation of the Plan in a jurisdiction where such Designated Subsidiary has employees; provided that such rules are consistent with the requirements of Section 423(b) of the Code. Such special rules may include (by way of example, but not by way of limitation) the establishment of a method for employees of a given Designated

Subsidiary to fund the purchase of shares other than by payroll deduction, if the payroll deduction method is prohibited by local law or is otherwise impracticable. Any special rules established pursuant to this Section 13 shall, to the extent possible, result in the employees subject to such rules having substantially the same rights as other participants in the Plan.

14. OPTIONEES NOT STOCKHOLDERS. Neither the granting of an Option to an employee nor the deductions from his pay shall constitute such employee a holder of the shares of Common Stock covered by an Option under the Plan until such shares have been purchased by and issued to him.

15. RIGHTS NOT TRANSFERABLE. Rights under the Plan are not transferable by a participating employee other than by will or the laws of descent and distribution, and are exercisable during the employee's lifetime only by the employee.

16. APPLICATION OF FUNDS. All funds received or held by the Company under the Plan may be combined with other corporate funds and may be used for any corporate purpose.

17. ADJUSTMENT IN CASE OF CHANGES AFFECTING COMMON STOCK. In the event of a subdivision of outstanding shares of Common Stock, or the payment of a dividend in Common Stock, the number of shares approved for the Plan, and the share limitation set forth in Section 8, shall be increased proportionately, and such other adjustments shall be made as may be deemed equitable by the Administrator. In the event of any other change affecting the Common Stock, such adjustment shall be made as may be deemed equitable by the Administrator to give proper effect to such event.

18. AMENDMENT OF THE PLAN. The Board may at any time, and from time to time, amend the Plan in any respect, except that without the approval, within 12 months of such Board action, by the stockholders, no amendment shall be made increasing the number of shares approved for the Plan or making any other change that would require stockholder approval in order for the Plan, as amended, to qualify as an "employee stock purchase plan" under Section 423(b) of the Code.

19. INSUFFICIENT SHARES. If the total number of shares of Common Stock that would otherwise be purchased on any Exercise Date plus the number of shares purchased under previous Offerings under the Plan exceeds the maximum number of shares issuable under the Plan, the shares then available shall be apportioned among participants in proportion to the amount of payroll deductions accumulated on behalf of each participant that would otherwise be used to purchase Common Stock on such Exercise Date.

20. TERMINATION OF THE PLAN. The Plan may be terminated at any time by the Board. Upon termination of the Plan, all amounts in the accounts of participating employees shall be promptly refunded.

21. GOVERNMENTAL REGULATIONS. The Company's obligation to sell and deliver Common Stock under the Plan is subject to obtaining all governmental approvals required in connection with the authorization, issuance, or sale of such stock.

The Plan shall be governed by Delaware law except to the extent that such law is preempted by federal law.

22. ISSUANCE OF SHARES. Shares may be issued upon exercise of an Option from authorized but unissued Common Stock, from shares held in the treasury of the Company, or from any other proper source.

23. TAX WITHHOLDING. Participation in the Plan is subject to any minimum required tax withholding on income of the participant in connection with the Plan. Each employee agrees, by entering the Plan, that the Company and its Subsidiaries shall have the right to deduct any such taxes from any payment of any kind otherwise due to the employee, including shares issuable under the Plan.

24. NOTIFICATION UPON SALE OF SHARES. Each employee agrees, by entering the Plan, to give the Company prompt notice of any disposition of shares purchased under the Plan where such disposition occurs within two years after the date of grant of the Option pursuant to which such shares were purchased.

25. EFFECTIVE DATE AND APPROVAL OF SHAREHOLDERS. The Plan shall take effect on the first day of the Company's Initial Public Offering, subject to approval by the holders of a majority of the votes cast at a meeting of stockholders at which a quorum is present or by written consent of the stockholders.

BURNS & LEVINSON LLP

125 SUMMER STREET BOSTON, MA 02110 T 617.345.3000 F 617.345.3299 WWW.BURNSLEV.COM

June 7, 2013

Harvard Bioscience, Inc. 84 October Hill Road Holliston, MA 01746-1371

Re: Securities Being Registered under Registration Statement on Form S-8

Ladies and Gentlemen:

This opinion letter is furnished to you in connection with your filing of a Registration Statement on Form S-8 (the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), on or about the date hereof relating to an aggregate of 250,000 shares (the "Shares") of Common Stock, \$0.01 par value per share (the "Common Stock"), of Harvard Bioscience, Inc., a Delaware corporation (the "Company"), that may be issued pursuant to the Company's Employee Stock Purchase Plan, as amended (the "Plan").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinion expressed below. We have relied, without independent verification, as to matters of fact material to the opinion set forth below, on certificates of officers of the Company.

The opinion expressed below is limited to the General Corporation Law of the State of Delaware.

For purposes of the opinion expressed below, we have assumed that a sufficient number of authorized but unissued shares of the Company's Common Stock will be available for issuance when the Shares are issued.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the Plan, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours, BURNS & LEVINSON LLP

/s/ BURNS & LEVINSON LLP

Consent of Independent Registered Public Accounting Firm

The Board of Directors Harvard Bioscience, Inc.:

We consent to the use of our reports dated March 18, 2013, with respect to the consolidated balance sheets of Harvard Bioscience, Inc. and subsidiaries as of December 31, 2012 and 2011, and the related consolidated statements of income, comprehensive income, stockholders' equity and cash flows for each of the years in the three-year period ended December 31, 2012, and the effectiveness of internal control over financial reporting as of December 31, 2012 incorporated by reference herein.

/s/ KPMG LLP

Boston, Massachusetts June 7, 2013