

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

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

**Lantheus Holdings, Inc.**

(Exact name of registrant as specified in its charter)

**Delaware**  
(State or other jurisdiction of  
incorporation or organization)

**35-2318913**  
(I.R.S. Employer  
Identification No.)

**331 Treble Cove Road**  
**North Billerica, Massachusetts 01862**  
(Address of Principal Executive Offices)

**01862**  
(Zip Code)

**2015 Equity Incentive Plan**  
(Full Title of Plan)

**Michael P. Duffy**  
**Senior Vice President, Strategy and Business Development,**  
**General Counsel and Secretary**  
**331 Treble Cove Road, Building 600-2**  
**North Billerica, Massachusetts 01862**  
(Name and address of agent for service)

**(978) 671-8408**  
(Telephone number, including area code, of agent for service)

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

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	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee
Common Stock, \$0.01 par value per share, reserved for issuance pursuant to the Lantheus Holdings, Inc. 2015 Equity Incentive Plan, as amended	2,140,000	\$8.65(2)	\$18,511,000.00	\$2,145.43

(1) Pursuant to Rule 416(a) of the Securities Act of 1933, as amended (the "Securities Act"), this Registration Statement shall also cover any additional securities as may be issuable under the 2015 Equity Incentive Plan, as amended, by reason of any stock splits, stock dividends, recapitalizations or similar transactions.

- (2) Estimated solely for purposes of calculating the registration fee pursuant to Rule 457(c) and (h) of the Securities Act based on the average of the high and low sales price of the Registrant's common stock on The NASDAQ Global Market on October 27, 2016, a date within five days of the date on which this Registration Statement is filed.
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## EXPLANATORY NOTE

Lantheus Holdings, Inc. (the “Registrant”) is filing this Registration Statement on Form S-8 (this “Registration Statement”) to register an additional 2,140,000 shares of its common stock, par value \$0.01 per share, that may be issued and sold under the Lantheus Holdings, Inc. 2015 Equity Incentive Plan, as amended (the “Plan”). This Registration Statement is submitted in accordance with General Instruction E to Form S-8 regarding registration of additional securities, and pursuant to that instruction, the contents of the Registration Statement on Form S-8 (File No. 333-205211) filed with the Securities and Exchange Commission on June 25, 2015 is incorporated herein by reference.

## PART II

### INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

**Item 8. Exhibits.**

See Exhibit Index below.

**SIGNATURES**

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of North Billerica, Commonwealth of Massachusetts, on October 31, 2016.

**Lantheus Holdings, Inc.**

By:           /s/ Mary Anne Heino            
Name: Mary Anne Heino  
Title: President and Chief Executive Officer

**POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS, that each of the undersigned constitutes and appoints each of Mary Anne Heino, John Crowley and Michael P. Duffy, each acting alone, her or his true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for such person and in her or his name, place and stead, in any and all capacities, to sign this Registration Statement on Form S-8 (including all pre-effective and post-effective amendments and registration statements filed pursuant to Rule 462(b) under the Securities Act of 1933), 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, each acting alone, full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming that any such attorney-in-fact and agent, or her or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

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.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u>          /s/ Mary Anne Heino          </u> Mary Anne Heino	President, Chief Executive Officer and Director (Principal Executive Officer)	October 31, 2016
<u>          /s/ John W. Crowley          </u> John W. Crowley	Chief Financial Officer (Principal Financial and Accounting Officer)	October 31, 2016
<u>          /s/ Brian Markison          </u> Brian Markison	Chairman of the Board of Directors	October 31, 2016
<u>          /s/ David Burgstahler          </u> David Burgstahler	Director	October 31, 2016
<u>          /s/ James C. Clemmer          </u> James C. Clemmer	Director	October 31, 2016
<u>          /s/ Samuel Leno          </u> Samuel Leno	Director	October 31, 2016
<u>          /s/ Dr. Frederick Robertson          </u> Dr. Frederick Robertson	Director	October 31, 2016
<u>          /s/ Dr. Derace Schaffer          </u> Dr. Derace Schaffer	Director	October 31, 2016
<u>          /s/ Sriram Venkataraman          </u> Sriram Venkataraman	Director	October 31, 2016

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**EXHIBIT INDEX**

<b><u>EXHIBIT NUMBER</u></b>	<b><u>DESCRIPTION OF EXHIBITS</u></b>	<b><u>INCORPORATED BY REFERENCE</u></b>			
		<b><u>FORM</u></b>	<b><u>FILE NUMBER</u></b>	<b><u>EXHIBIT</u></b>	<b><u>FILING DATE</u></b>
4.1	Amended and Restated Certificate of Incorporation of Lantheus Holdings, Inc.	8-K	001-36569	3.1	June 30, 2015
4.2	Bylaws of Lantheus Holdings, Inc.	8-K	001-36569	3.2	June 30, 2015
4.3	Common Stock Certificate.	8-K	001-36569	4.1	June 30, 2015
4.4	Lantheus Holdings, Inc. 2015 Equity Incentive Plan.	S-1	333-196998	10.37	June 24, 2015
4.5	Form of 2015 Restricted Stock Agreement.	S-1	333-196998	10.38	June 24, 2015
4.6	Form of 2015 Option Award Agreement.	S-1	333-196998	10.39	June 24, 2015
4.7	Amendment to Lantheus Holdings, Inc. 2015 Equity Incentive Plan.	8-K	001-36569	10.1	April 28, 2016
5.1*	Legal Opinion of Ropes & Gray LLP.				
23.1*	Consent of Independent Registered Public Accounting Firm, Deloitte & Touche LLP.				
23.2*	Consent of Ropes & Gray LLP (included as part of Exhibit 5.1).				
24.1*	Power of Attorney (included as part of the signature page hereto).				

\* Filed herewith



ROPES & GRAY LLP  
PRUDENTIAL TOWER  
800 BOYLSTON STREET  
BOSTON, MA 02199-3600  
WWW.ROPESGRAY.COM

October 31, 2016

Lantheus Holdings, Inc.  
331 Treble Cove Road  
North Billerica, MA 01862

Ladies and Gentlemen:

This opinion letter is furnished to you in connection with the registration statement on Form S-8 (the "Registration Statement"), filed by Lantheus Holdings, Inc., a Delaware corporation (the "Company"), on the date hereof, with the Securities and Exchange Commission under the Securities Act of 1933, as amended (the "Securities Act"), for the registration of 2,140,000 shares of Common Stock, \$0.01 par value, of the Company (the "Shares"). The Shares are issuable under the Company's 2015 Equity Incentive Plan, as amended (the "Plan").

We are familiar with the actions taken by the Company in connection with the adoption of the amendment to the Plan providing for the inclusion of the Shares. We have examined such certificates, documents and records and have made such investigation of fact and such examination of law as we have deemed appropriate in order to enable us to render the opinions set forth herein. In conducting such investigation, we have relied, without independent verification, upon certificates of officers of the Company, public officials and other appropriate persons.

The opinions expressed below are limited to the Delaware General Corporation Law.

Based upon and subject to the foregoing, we are of the opinion that the Shares have been duly authorized and, when the Shares have been issued and sold in accordance with the terms of the Plan, the Shares will be validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion letter 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 Securities Act or the rules and regulations thereunder.

Very truly yours,

/s/ Ropes & Gray LLP

Ropes & Gray LLP

**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 March 2, 2016, relating to the consolidated financial statements of Lantheus Holdings, Inc. appearing in the Annual Report on Form 10-K of Lantheus Holdings, Inc. for the year ended December 31, 2015.

/s/ Deloitte & Touche LLP

Boston, Massachusetts

October 31, 2016