Lantheus Holdings, Inc. Form FWP July 24, 2014

Issuer Free Writing Prospectus dated July 24, 2014

Filed by Lantheus Holdings, Inc.

Pursuant to Rule 433 under the Securities Act of 1933

Registration Statement No. 333-196998

Lantheus Holdings, Inc.

Free Writing Prospectus

This free writing prospectus relates to the initial public offering of common stock of Lantheus Holdings, Inc. (Lantheus) and should be read together with the preliminary prospectus dated July 16, 2014 (the Preliminary Prospectus) that is included in Amendment No. 2 to the Registration Statement on Form S-1 (File No. 333-196998). On July 24, 2014, Lantheus filed Amendment No. 3 to the Registration Statement on Form S-1 relating to this offering of common stock (Amendment No. 3), which may be accessed through the following link:

http://www.sec.gov/Archives/edgar/data/1521036/000119312514278700/d715471ds1a.htm

This free writing prospectus presents below certain information included in Amendment No. 3 in the section referenced below and supplements the Preliminary Prospectus and supersedes the information contained in the Preliminary Prospectus to the extent such information is inconsistent with the information in this free writing prospectus. You should carefully read Amendment No. 3 before deciding to invest in the common stock of Lantheus.

PROSPECTUS SUMMARY

Recent Developments

The following sentence is added to the disclosure:

Net income (loss) is expected to be between \$(1.5) million and \$(2.5) million, representing an improvement of \$12.9 million to \$11.9 million compared to net income (loss) of \$(14.4) million for the second quarter of 2013. This year over year increase was driven primarily by revenue growth, a favorable sales mix affecting gross margin and reduced research and development, or R&D, expense relating to the strategic shift in our R&D program, while reflecting higher levels of marketing expenses during the first half of 2014.

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