Filed Pursuant to Rule 433 of the Securities Act of 1933 Issuer Free Writing Prospectus dated October 31, 2014 Registration Statement No. 333-198383



Jaguar Animal Health, Inc.

Update to Preliminary Prospectus

Dated October 28, 2014

On October 31, 2014, the issuer, Jaguar Animal Health, Inc., filed Amendment No. 4 to its Registration Statement on Form S-1 (File No. 333-198383) to update its preliminary prospectus dated October 28, 2014 (the "Preliminary Prospectus") to provide certain updated disclosures to reflect the following recent developments:

Standby Line of Credit and Warrant Issuance

In October 2014, in connection with the entry into a Standby Bridge Financing Agreement dated October 30, 2014 with GPB Life Science Holdings LLC and 31 Group, LLC, each an accredited investor, providing for an aggregate \$2.0 million loan commitment, we issued these accredited investors warrants to acquire shares of common stock with an exercise price equal to the initial public offering price. Based upon an assumed initial public offering price of \$8.00 per share, which is the midpoint of the price range set forth on the cover page of this prospectus, the warrants would be exercisable for an aggregate of 250,000 shares of common stock. The exact number of shares issuable upon exercise of the warrants will be determined by dividing \$2.0 million by the initial public offering price. The warrants will become exercisable six months after the closing of this offering and have a 5-year term. We have agreed not to borrow any funds under the Standby Bridge Financing Agreement automatically terminates upon completion of this offering. Accordingly, we may never borrow any funds pursuant to the Standby Bridge Financing Agreement.

NASDAQ Capital Market

Our common stock has been approved for listing on The NASDAQ Capital Market under the symbol "JAGX."

Canalevia—FDA Meeting; MUMS Designation

In October 2014, we met with the Food and Drug Administration, or FDA, regarding MUMS designation for Canalevia for chemotherapy induced diarrhea in dogs. We discussed the timing for submissions of the technical sections of the New Animal Drug Application, or NADA, filing, and currently anticipate submission of the rolling NADA by the end of 2014.

A copy of the revised preliminary prospectus dated October 31, 2014 included in Amendment No. 4 to the Registration Statement can be obtained by following this hyperlink:

Link to http://www.sec.gov/Archives/edgar/data/1585608/000104746914008720/a2221982zs-1a.htm

You should read the entire Preliminary Prospectus carefully, including the section titled "Risk Factors" and the financial statements and related notes, before deciding to invest in the securities described in the Preliminary Prospectus. The following information supplements the information contained in the Preliminary Prospectus.

The issuer has filed a registration statement (including the Preliminary Prospectus) with the Securities and Exchange Commission (the "SEC") for the offering to which this communication relates. Before you invest, you should read the Preliminary Prospectus in that registration statement and other documents the issuer has filed with the SEC for more complete information about the issuer and this offering. You can review these documents and other documents for free by visiting EDGAR on the SEC website www.sec.gov. Alternatively, any underwriter or any dealer participating in the offering will arrange to send you the Preliminary Prospectus if you request it by calling BMO Capital Markets Corp. by telephone at (800) 414-3627 or by email to bmoprospectus@bmo.com or Guggenheim Securities, LLC by telephone at (212) 518-9349 or by email to GSEquityProspectusDelivery@guggenheimpartners.com.

QuickLinks

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