

Prospectus Supplement No. 2
(To Prospectus dated September 23, 2008)



ACADIA
Pharmaceuticals

Common Stock

This Prospectus Supplement No. 2 supplements and amends the prospectus dated September 23, 2008 (the "Prospectus"), as supplemented by Prospectus Supplement No. 1 dated October 28, 2009 ("Supplement No. 1"), relating to the resale by Kingsbridge Capital Limited, or Kingsbridge, of up to 7,422,364 shares of our common stock.

This prospectus supplement should be read in conjunction with the Prospectus and Supplement No. 1, which are to be delivered with this prospectus supplement. This prospectus supplement is not complete without, and may not be delivered or utilized except in connection with, the Prospectus, including any amendments or supplements to it.

We are filing this prospectus supplement to reflect a draw down by us pursuant to the common stock purchase agreement by and between us and Kingsbridge, dated August 4, 2008 and amended as of September 21, 2010.

The table appearing under the caption "Selling Stockholder" on page 5 of the Prospectus (as supplemented by Supplement No. 1) is hereby further supplemented by adding the following to the end of footnote (2) to that table:

"On September 21, 2010, we delivered notice to Kingsbridge to effect an eight-day draw down. The first trading day of the pricing period for this draw down was September 22, 2010, and, in connection with this draw down, on September 28 and October 4, 2010, we issued an aggregate of 926,590 shares of our common stock to Kingsbridge at an aggregate purchase price of \$780,000."

Our common stock is quoted on the NASDAQ Global Market under the symbol "ACAD". The prices at which Kingsbridge purchased these shares from us were established under the common stock purchase agreement and represented a discount of 12% per share from the prices of our common stock on the NASDAQ Global Market for the period from September 22, 2010 to October 1, 2010. On October 4, 2010, the last reported sale price of our common stock on the NASDAQ Global Market was \$0.91 per share.

INVESTING IN OUR COMMON STOCK INVOLVES RISKS. SEE "RISK FACTORS" ON PAGE 4 OF THE PROSPECTUS AND IN OUR MOST RECENT FORM 10-K OR FORM 10-Q THAT HAS BEEN FILED UNDER THE SECURITIES EXCHANGE ACT OF 1934, AS AMENDED, AND THAT IS INCORPORATED BY REFERENCE INTO THE PROSPECTUS.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined if this prospectus supplement or the prospectus to which it relates is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this Prospectus Supplement No. 2 is October 4, 2010.