

**PROSPECTUS SUPPLEMENT  
(To Prospectus Dated July 19, 2016)**

**CATABASIS PHARMACEUTICALS, INC.**

**Up to \$4,881,704**

**Common Stock**

This prospectus supplement amends and supplements the information in the prospectus, dated July 19, 2016, filed as a part of our registration statement on Form S-3 (File No. 333-212382), as previously supplemented by our prospectus supplements dated August 11, 2016, September 22, 2016 and November 10, 2016, or the Prior Prospectus. This prospectus supplement should be read in conjunction with the Prior Prospectus, and is qualified by reference thereto, except to the extent that the information herein amends or supersedes the information contained in the Prior Prospectus. This prospectus supplement is not complete without, and may only be delivered or utilized in connection with, the Prior Prospectus, and any future amendments or supplements thereto.

Under the Prior Prospectus, we initially registered pursuant to General Instruction I.B.6. of Form S-3 up to \$10,000,000 of our common stock, \$0.001 par value per share, for offer and sale pursuant to a Sales Agreement, dated August 11, 2016, or the Sales Agreement, between us and Cowen and Company, LLC, or Cowen. On September 22, 2016, we reduced the amount of common stock that we were offering pursuant to the Sales Agreement, such that we were only offering \$1,424,995 of common stock from and after that date, which amount was in addition to the \$1,601,344 of our common stock that had been sold under the Prior Prospectus as of that date. On November 10, 2016, we increased the amount of common stock that we were offering pursuant to the Sales Agreement, such that we were offering \$8,398,656 of common stock from and after that date, which amount was in addition to the \$1,601,344 of our common stock that had been sold under the Prior Prospectus as of that date. From August 11, 2016 through the date of this prospectus supplement, we sold an aggregate of \$3,884,557 of our common stock under the Prior Prospectus pursuant to General Instruction I.B.6. As of the date of this prospectus supplement, we are decreasing the amount of common stock that we are offering pursuant to the Sales Agreement, such that we are offering an additional \$4,881,704 of common stock for sale under the Sales Agreement from and after the date hereof.

The aggregate market value of our outstanding common stock held by non-affiliates as of the date of this prospectus supplement was \$60,798,785 based on 12,233,156 shares of outstanding common stock held by non-affiliates, and a per share price of \$4.97 based on the closing sale price of our common stock on January 19, 2017. Pursuant to General Instruction I.B.6. of Form S-3, in no event will we sell, pursuant to the registration statement of which this prospectus supplement forms a part, securities in a public primary offering with a value exceeding one-third of the aggregate market value of our common stock held by non-affiliates in any 12-month period, so long as the aggregate market value of our outstanding common stock held by non-affiliates remains below \$75 million. During the 12 calendar months prior to and including the date of this prospectus supplement, we sold pursuant to General Instruction I.B.6. of Form S-3 an aggregate of \$15,384,557 of our common stock. As a result, we are eligible to offer and sell up to an aggregate of \$4,881,704 of shares of our common stock pursuant to such instruction.

**Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.**

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**Cowen and Company**

**The date of this prospectus supplement is March 16, 2017.**

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