

DELCATH SYSTEMS, INC.

Form 424B5

October 10, 2014

Filed pursuant to Rule 424(b)(5)

Registration No. 333-187230

PROSPECTUS SUPPLEMENT

(To the Prospectus dated April 18, 2013)

\$5,953,924

Common Stock

This prospectus supplement updates and amends certain information contained on the cover page of the prospectus, dated April 18, 2013 (the “2013 prospectus”), which relates to the offer and sale of shares of our common stock through Cowen and Company, LLC, or Cowen, in accordance with the terms of the sales agreement we entered into with Cowen. This prospectus supplement should be read in conjunction with the 2013 prospectus, and is qualified by reference to the 2013 prospectus, except to the extent that the information presented herein supersedes the information contained in the 2013 prospectus. This prospectus supplement is not complete without, and may only be delivered or utilized in connection with, the 2013 prospectus, including any amendments or supplements thereto.

Through October 9, 2014, we have sold shares of our common stock through Cowen under the sales agreement for an aggregate purchase price of \$9,648,244. We are filing this prospectus supplement to amend the 2013 prospectus because we are now subject to General Instruction I.B.6 of Form S-3, which limits the amounts that we may sell under the registration statement of which this prospectus supplement and the 2013 prospectus are a part. As a result of these limitations and the current public float of our common stock, and in accordance with the terms of the sales agreement, we may offer and sell additional shares of our common stock having an aggregate offering price of up to \$5,953,924 from time to time through Cowen. If our public float increases such that we may sell additional amounts under the sales agreement and the registration statement of which this prospectus supplement and the 2013 prospectus are a part, we will file another prospectus supplement prior to making additional sales.

Our common stock is listed on The NASDAQ Global Market under the symbol “DCTH.” On October 9, 2014, the last reported sale price of our common stock on The NASDAQ Global Market was \$1.90 per share. The aggregate market value of our common stock held by non-affiliates pursuant to General Instruction I.B.6 of Form S-3 is \$17,861,775, which was calculated based on 9,400,934 shares of our common stock outstanding held by non-affiliates and at a price of \$1.90 per share, the closing price of our common stock on October 9, 2014. As of the date hereof, we have offered and sold no securities pursuant to General Instruction I.B.6 of Form S-3 during the prior 12 calendar month period that ends on and includes the date hereof.

Investing in our common stock involves a high degree of risk. You should review carefully the risks and uncertainties referenced under the heading “Risk Factors” beginning on page 6 of the 2013 prospectus and under the heading “Risk Factors” included in our most recent annual report on Form 10-K.

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

Cowen and Company

The date of this prospectus supplement is October 10, 2014.