

PROSPECTUS SUPPLEMENT NO. 5

(TO PROSPECTUS DATED JUNE 20, 2018)

**INVIVO THERAPEUTICS HOLDINGS CORP.
388,403 shares of Common Stock and
388,403 Warrants to purchase shares of Common Stock
and
6,242,811 Pre-Funded Warrants to purchase shares of Common Stock and
6,242,811 Warrants to purchase shares of Common Stock**

This prospectus supplement No. 5 supplements and amends the prospectus dated June 20, 2018, as supplemented by prospectus supplement No.1, dated September 28, 2018, prospectus supplement No. 2, dated October 5, 2018, prospectus supplement No. 3, dated November 8, 2018, and prospectus supplement No. 4, dated November 13, 2018, related to the sale or other disposition from time to time of 388,403 shares of common stock, par value \$0.00001 per share (the “Common Stock”), of InVivo Therapeutics Holdings Corp., a Nevada corporation (the “Company,” “we,” “us” or “our”), together with up to 388,403 warrants to purchase shares of Common Stock, and 6,242,811 pre-funded warrants to purchase shares of Common Stock together with 6,242,811 warrants to purchase shares of Common Stock, issued to Ladenburg Thalmann & Co. Inc., the underwriter named in the prospectus, also referred to as LTCO, pursuant to an underwriting agreement dated June 21, 2018 that we entered into with LTCO.

This prospectus supplement should be read in conjunction with the prospectus dated June 20, 2018, which is to be delivered with this prospectus supplement. This prospectus supplement is qualified by reference to the prospectus except to the extent that the information in this prospectus supplement supersedes the information contained in the prospectus. 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.

Our common stock is quoted on The Nasdaq Capital Market under the symbol “NVIV.” On November 15, 2018, the last reported sale price of our common stock on The Nasdaq Capital Market was \$1.99 per share.

This prospectus supplement incorporates into our prospectus the information contained in our Current Report on Form 8-K filed with the Securities and Exchange Commission on November 16, 2018 and attached hereto.

Investing in our common stock involves risks. See “Risk Factors” beginning on page 10 of 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 are truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is November 16, 2018.

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**

Washington, D.C. 20549

FORM 8-K

CURRENT REPORT

Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

November 13, 2018

Date of Report (Date of Earliest Event Reported)

INVIVO THERAPEUTICS HOLDINGS CORP.

(Exact Name of Registrant as Specified in Charter)

Nevada
(State or Other
Jurisdiction of Incorporation)

001-37350
(Commission File Number)

36-4528166
(IRS Employer
Identification No.)

**One Kendall Square, Suite B14402
Cambridge, Massachusetts 02139**
(Address of Principal Executive Offices) (Zip Code)

(617) 863-5500
(Registrant's Telephone Number, Including Area Code)

(Former Name or Former Address, If Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (see General Instruction A.2. below):

- ☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
- ☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
- ☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
- ☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 5.02 Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

On November 13, 2018, Jeffrey Modestino informed InVivo Therapeutics Holdings Corp. (the “Company”) that his consulting engagement with the Company will terminate effective November 23, 2018. Mr. Modestino has served as principal financial officer and principal accounting officer of the Company since May 2018. On November 15, 2018, the Board of Directors of the Company appointed Richard Toselli, M.D., the Company’s current Chief Executive Officer, to also serve as its principal financial officer effective as of November 23, 2018.

Dr. Toselli, 61, has served as the Company’s Chief Executive Officer since February 2018 and served as the Company’s Acting Chief Executive Officer from December 2017 to February 2018. He also serves as the Company’s Chief Medical Officer, a role he has held since July 2017. Prior to joining the Company, Dr. Toselli served as the Chief Medical Officer for Cochlear Limited, a medical device company, from June 2016 until March 2017. Prior to that, Dr. Toselli served at Sanofi, a pharmaceutical company, from July 2012 to June 2016 in various levels of increasing responsibility, including Vice President of Global Medical Affairs - Immunology and Inflammation, Biologics Division; Vice President of Global Medical Affairs and Head of the Biosurgery Discovery Performance Unit; and Vice President of Global Medical Affairs, Biosurgery.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

INVIVO THERAPEUTICS HOLDINGS CORP.

Date: November 16, 2018

By: /s/ RICHARD TOSELLI

Name: Richard Toselli

Title: President and Chief Executive Officer
