

Prospectus Supplement to Prospectus dated April 23, 2012

InVivo Therapeutics Holdings Corp.

26,047,200 Shares of Common Stock

This prospectus supplement updates the prospectus dated April 23, 2012 relating to the offer for sale of up to an aggregate of 26,047,200 shares of common stock of InVivo Therapeutics Holdings Corp. by the selling securityholders identified in the prospectus and this prospectus supplement, and any of their pledgees, donees, transferees or other successors in interest.

We are providing this prospectus supplement to update the table in the prospectus under the caption “Selling Securityholders” to reflect transfers of warrants to purchase shares of common stock by certain selling securityholders. The amounts set forth below are based upon information provided to us by the selling securityholders (or his or its representatives), or on our records, and are accurate to the best of our knowledge. Unless we indicate otherwise, the information in this prospectus supplement is as of May 10, 2013.

| <u>Name</u> | <u>Securities Beneficially Owned Prior to the Offering</u> | | <u>Securities Offered Hereby</u> | | <u>Securities Beneficially Owned After this Offering</u> | |
|---------------------------------------|--|-----------------|--------------------------------------|---|--|-----------------|
| | <u>Common Stock (1)</u> | <u>Warrants</u> | <u>Common Stock</u> | <u>Common Stock Underlying Warrants</u> | <u>Common Stock</u> | <u>Warrants</u> |
| Craig Whited | 350,000 | 220,000 | 350,000 | 220,000 | — | — |
| Matthew Rosenblum | N/A | 130,000 | N/A | 130,000 | N/A | — |
| RRC Bio Fund LP (2) | 250,000 | N/A | 250,000 | N/A | — | N/A |
| Options Opportunistic Corp. | N/A | 83,000 | N/A | 83,000 | N/A | — |
| Warberg Opportunistic Trading Fund LP | N/A | 83,000 | N/A | 83,000 | N/A | — |
| Warberg WF I LP | N/A | 84,000 | N/A | 84,000 | N/A | — |

(1) Does not include shares of common stock underlying the warrants.

(2) In accordance with Rule 13d-3 under the Exchange Act, James A. Silverman may be deemed a control person of the shares owned by RRC Bio Fund LP, with final voting power and investment control over such shares.

This prospectus supplement is not complete without the prospectus dated April 23, 2012, as supplemented to date, and we have not authorized anyone to deliver or use this prospectus supplement without the prospectus.

The date of this prospectus supplement is May 10, 2013.