

INVIVO THERAPEUTICS HOLDINGS CORP.

Form 424B3

July 25, 2012

Filed Pursuant to Rule 424(b)(3)

Registration No. 333-171998

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 respective selling securityholder (or its or his 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 July 25, 2012.

| Name | Securities Beneficially Owned Prior to the Offering | | Securities Offered Hereby Common Stock | | Securities Beneficially Owned After this Offering | |
|--|--|----------|--|------------------------|---|----------|
| | Common Stock (1) | Warrants | Common Stock | Underlying Warrants | Common Stock | Warrants |
| | Gibralt Capital Corp.(2) | 500,000 | 250,000 | 500,000 | 250,000 | |
| Kevin Doherty | 10,000 | 5,000 | 10,000 | 5,000 | | |
| Michael Doherty | N/A | 5,000 | N/A | 5,000 | | |
| RBC Dominion Securities Inc. ITF Bel-Fran Charitable Foundation | N/A | 250,000 | N/A | 250,000 | | |

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

(2) In accordance with Rule 13d-3 under the Securities Exchange Act of 1934, as amended, Samuel Belzberg, Jamie Farrar, Ryan Chan and Ryan Dunfield may be deemed control persons of the shares owned by Gibralt Capital Corp., 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 July 25, 2012.