

**Prospectus Supplement No. 2
(To Prospectus dated June 7, 2012)**

NOVELOS THERAPEUTICS, INC.

**5,420,800 Units Consisting of
5,420,800 Shares of Common Stock and
Class A Warrants to Purchase 2,710,400 Shares of Common Stock
Class B Warrants to Purchase 5,420,800 Shares of Common Stock**

This prospectus supplement supplements the Prospectus dated June 7, 2012, relating to the sale of 5,420,800 units, consisting of 5,420,800 shares of our common stock, Class A Warrants to purchase up to 2,710,400 shares of our common stock and Class B Warrants to purchase up to 5,420,800 shares of our common stock. This prospectus supplement should be read in conjunction with the Prospectus.

Amendment to Class B Warrants to Purchase 5,255,000 Shares of Common Stock

On September 10, 2012, we amended Class B Warrants to purchase 5,255,000 shares of common stock to extend the expiration date for the exercise of such warrants for a period of thirty days; from September 11, 2012 to October 11, 2012. We filed with the Securities and Exchange Commission the form of the Amendment to the Class B Warrants on Form 8-K on September 12, 2012.

**Investing in our common stock involves a high degree of risk.
See Risk Factors beginning on page 6 of the Prospectus.**

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

The date of this prospectus supplement is September 10, 2012
