

**AMENDMENT NO. 3 DATED SEPTEMBER 5, 2025
to Prospectus Supplement dated June 19, 2024
(To Prospectus dated June 12, 2024)**



MUSTANG BIO, INC.

**Up to \$4,750,000
Common Stock**

This Amendment No. 3 to Prospectus Supplement (this “Amendment”) further amends our prospectus supplement dated June 19, 2024 (the “Prospectus Supplement”). This Amendment should be read in conjunction with Amendment No. 1 to Prospectus Supplement (“Amendment No. 1”) and Amendment No. 2 to Prospectus Supplement (“Amendment No. 2”), the Prospectus and Registration Statement on Form S-3 containing the base prospectus and an ATM prospectus, each dated June 12, 2024 (File No. 333-279891) (collectively, the “Prospectus”), and is qualified by reference thereto, except to the extent that the information herein amends or supersedes the information contained in the Prospectus Supplement and the Prospectus, and any future amendments or supplements thereto. This Amendment is not complete without, and may only be delivered or utilized in connection with, the Prospectus Supplement, as amended, and the Prospectus, and any future amendments or supplements.

We entered into an At the Market Offering Agreement (the “sales agreement”) dated May 31, 2024, with H.C. Wainwright & Co., LLC (“Wainwright”), as Agent, relating to the offer and sale of shares of our common stock, par value \$0.0001 per share, offered by the Prospectus. On June 19, 2024, we filed the Prospectus Supplement to suspend the sales agreement and to terminate the continuous offering by us under the Prospectus, effective on June 19, 2024. On July 3, 2024, we filed Amendment No. 1 to amend the Prospectus Supplement to reinstate the sales agreement and the continuous offering by us pursuant to the Prospectus and to update the amount of shares of common stock we were eligible to sell under General Instruction I.B.6 of Form S-3. On August 16, 2024, we filed Amendment No. 2 to update the amount of shares of common stock we were eligible to sell under General Instruction I.B.6 of Form S-3. We are filing this Amendment to further update the amount of shares of common stock we are eligible to sell under General Instruction I.B.6 of Form S-3.

As of September 5, 2025, the aggregate market value of our outstanding common stock held by non-affiliates, or the public float, was \$20,677,132, which was calculated based on 6,190,758 shares of our outstanding common stock held by non-affiliates as of September 5, 2025, and at a price of \$3.34 per share, the closing price of our common stock on July 7, 2025. In no event will we sell shares of our common stock pursuant to the Prospectus and the Prospectus Supplement, as amended by this Amendment, in an amount greater than the lower of (i) such amount as is registered on our Registration Statement on Form S-3 of which the Prospectus forms a part or, (ii) pursuant to General Instruction I.B.6, an amount with a value, taken together with the aggregate market value of all other securities sold by us or on our behalf pursuant to General Instruction I.B.6 to Form S-3 during the prior 12-month calendar period that ends on and includes the date hereof, of more than one-third of the aggregate market value of our common stock held by non-affiliates in any 12-month period, so long as the aggregate market value of our common stock held by non-affiliates is less than \$75,000,000. As of the date of this Amendment, we have offered and sold \$2,102,821 of securities pursuant to General Instruction I.B.6 of Form S-3 during the prior 12-month calendar period that ends on and includes the date hereof.

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 shares of our common stock having an aggregate offering price of up to \$4,750,000 from time to time through Wainwright.

Investing in our common stock involves a high degree of risk. Before making an investment decision, please read the information under the heading “Risk Factors” in the Prospectus and the documents incorporated by reference therein.

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

H.C. Wainwright & Co.

The date of this Amendment No. 3 to Prospectus Supplement is September 5, 2025.
