

PROSPECTUS SUPPLEMENT

(To Prospectus dated October 22, 2021, as supplemented by Prospectus Supplement No. 1 dated November 19, 2021, Prospectus Supplement No. 2 dated July 19, 2022, Prospectus Supplement No. 3 dated October 12, 2022 and Prospectus Supplement No. 4 dated March 29, 2023)



Up to \$106,000,000

Common Stock

This prospectus supplement amends and supplements the information in the prospectus, dated October 22, 2021 (the “Prospectus”), filed with the Securities and Exchange Commission as a part of our registration statement on Form S-3 (File No. 333-256850), as previously supplemented by Prospectus Supplement No. 1 dated November 19, 2021, Prospectus Supplement No. 2 dated July 19, 2022, Prospectus Supplement No. 3 dated October 12, 2022 and Prospectus Supplement No. 4 dated March 29, 2023, relating to the offer and sale of up to \$150,000,000 of shares of our common stock, pursuant to the Open Market Sale AgreementSM, as amended (the “Sale Agreement”), we previously entered into with Jefferies LLC (“Jefferies”). We are filing this prospectus supplement to amend the Prospectus because we are no longer subject to General Instruction I.B.6. of Form S-3, which limits the amounts that we may sell under the registration statement of which this prospectus supplement and the Prospectus are a part. We currently may offer and sell shares of our common stock having an aggregate offering price of up to \$106,000,000 under the Sale Agreement. If we become subject to the offering limits of General Instruction I.B.6 in the future, we will file another prospectus supplement.

This prospectus supplement should be read in conjunction with 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. This prospectus supplement is not complete without, and may only be delivered or utilized in connection with, the Prospectus and any future amendments or supplements thereto. Through June 6, 2023, we have sold 11,783,940 shares of our common stock for aggregate gross proceeds of approximately \$44.0 million in accordance with the Sale Agreement under the Prospectus.

Our common stock is listed on the Nasdaq Capital Market under the symbol “ABEO.” The aggregate market value of our common stock held by non-affiliates as of June 6, 2023 pursuant to General Instruction I.B.6 of Form S-3 is \$76,245,662, which was calculated based on 18,919,519 shares of our common stock outstanding held by non-affiliates and at a price of \$4.03 per share, the closing price of our common stock on June 5, 2023. In accordance with the terms of the Sale Agreement, we are registering the offer and sale of shares of our common stock having an aggregate offering price up to \$106,000,000 from time to time through Jefferies. In addition, we have agreed to reimburse Jefferies for fees and disbursements paid to its legal counsel, in an amount not to exceed \$50,000, in connection with this prospectus supplement and, upon the occurrence of certain events specified in the Sale Agreement, up to \$15,000 in connection with each such specified event. In accordance with FINRA Rule 5110, these reimbursed fees and expenses are deemed sales compensation for this offering.

Investing in our securities involves significant risks. Please see “Risk Factors” beginning on page S-4 of the Prospectus and in the documents incorporated by reference into the Prospectus and in our most recent Annual Report on Form 10-K and in our most recent Quarterly Reports on Form 10-Q, and any amendments thereto, which are incorporated by reference into the Prospectus, and under similar headings in the other documents that are filed after the date hereof and incorporated by reference into this prospectus supplement and the Prospectus for a discussion of the factors you should carefully consider before deciding to purchase our common stock.

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

Jefferies LLC

The date of this prospectus supplement is June 7, 2023
