

PROSPECTUS SUPPLEMENT

(To Prospectus dated April 7, 2022)

BIOXCEL THERAPEUTICS, INC.

THE DATE OF THIS PROSPECTUS SUPPLEMENT IS JUNE 4, 2024

This Prospectus Supplement (this “Prospectus Supplement”) updates, amends and supplements the prospectus of BioXcel Therapeutics, Inc. (the “Company”), dated April 7, 2022 (as amended and supplemented, the “Prospectus”), which forms a part of the Registration Statement on Form S-3, as amended (Registration No. 333-240118). Capitalized terms used in this Prospectus Supplement and not otherwise defined herein have the meanings specified in the Prospectus.

This Prospectus Supplement is being filed to supplement, modify or supersede certain information contained in the Prospectus. Any statement in the Prospectus that is modified or superseded is not deemed to constitute a part of the Prospectus, except as modified or superseded by this prospectus supplement. Except to the extent that the information in this Prospectus Supplement modifies or supersedes the information contained in the Prospectus, this prospectus supplement should be read, and will be delivered, with the Prospectus. This Prospectus Supplement is not complete without, and may not be utilized except in connection with, the Prospectus.

INVESTING IN THE COMPANY’S SECURITIES INVOLVES RISKS. SEE THE “RISK FACTORS” ON PAGE 5 OF THIS PROSPECTUS AND THE DOCUMENTS INCORPORATED BY REFERENCE THEREIN.

The Company’s common stock is listed on the Nasdaq Capital Market under the symbol “BTAI.” On May 31, 2024, the last reported sale price of our common stock on the Nasdaq Capital Market was \$1.81 per share.

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 this prospectus. Any representation to the contrary is a criminal offense.

ABOUT THIS PROSPECTUS SUPPLEMENT

This Prospectus Supplement is being filed to amend and update the “Selling Stockholders” table and applicable footnote of the Prospectus to reflect a transfer 566,245 of the Company’s shares from BioXcel LLC to BioXcel Holdings, Inc. that occurred on May 29, 2024 (the “Transfer”). This Prospectus Supplement is not increasing the number of shares being offered under the Prospectus, but only reflecting the transfer of shares of common stock previously registered.

The Transfer is being executed as part of a process for certain minority investors in BioXcel LLC and BioXcel Holdings, Inc. to acquire their pro rata portion of shares of the Company owned by BioXcel (the “Redemption”). None of the minority investors are, or have ever been, directors or officers of the Company.

Following the Transfer, BioXcel LLC intends to sell an aggregate of 252,028 shares pursuant to the Prospectus Supplement and the Prospectus from time to time (each sale, a “Tax Sale”) to fund the payment of certain tax obligations in connection with the Redemption. In connection with each Tax Sale, BioXcel Holdings, Inc. intends to transfer a proportionate number of the Company’s shares, up to an aggregate of 566,245 shares, to its minority investors as part of a redemption transaction whereby such minority investors will surrender their interest in BioXcel Holdings, Inc.

After giving effect to the Transfer of 566,245 shares and the Tax Sales of 252,028 shares by BioXcel LLC, BioXcel LLC will own 7,685,501 shares, representing approximately 22.9% of the Company’s outstanding shares as of March 31, 2024. Following the completion of the distribution of 566,245 shares by BioXcel Holdings, Inc. as part of the Redemption, BioXcel Holdings, Inc. will own no shares of common stock.

SELLING SECURITYHOLDERS

This prospectus relates to the possible resale by certain securityholders, who we refer to in this prospectus as the “selling securityholders,” of up to 8,503,774 shares of our common stock that were issued and outstanding as of the original date of filing of the registration statement of which this prospectus forms a part. The selling securityholders identified below may currently hold or acquire at any time shares of common stock in addition to those registered hereby. The selling securityholders originally acquired the shares of our common stock included in this prospectus pursuant to a private transaction conducted according to exemptions from the Securities Act.

We have prepared the paragraphs immediately following this paragraph, the table that follows and the related note based on information supplied to us by the selling securityholders on or prior to March 31, 2024. We have not sought to verify such information. Additionally, the selling securityholders may have sold or transferred some or all of the shares of common stock listed below in exempt or non-exempt transactions since the date on which the information was provided to us. Other information about the selling securityholders may change over time.

The table below lists the selling securityholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Exchange Act and the rules and regulations thereunder) of the shares of common stock of the Company held by the selling securityholders. The first column lists the number of shares of common stock of the Company directly by the selling securityholders, based on their respective ownership of common stock, as of March 31, 2024.

The selling securityholders, and its respective partners, pledgees, donees, transferees or other successors (each also a “selling securityholder” for purposes of this prospectus) that may receive shares registered hereunder from the selling securityholders may sell up to all of the shares of common stock shown in the table below under the heading “Shares Being Offered Hereby” pursuant to this prospectus in one or more transactions from time to time as described under the “Plan of Distribution” contained in the Prospectus.

The table below lists the selling securityholders and other information regarding the beneficial ownership (as determined under Section 13(d) of the Exchange Act and the rules and regulations thereunder) of the shares of common stock of the Company held by the selling securityholders, based on 33,631,280 shares of the Company’s common stock issued and outstanding as of March 31, 2024.

NAME OF SELLING STOCKHOLDER	SHARES BENEFICIALLY OWNED PRIOR TO THE OFFERING		SHARES BEING OFFERED HEREBY	SHARES BENEFICIALLY OWNED AFTER THE OFFERING	
	NUMBER OF SHARES	PERCENTAGE		NUMBER OF SHARES	PERCENTAGE
BioXcel LLC ⁽¹⁾	7,937,529	23.7%	7,937,529	–	–
BioXcel Holdings, Inc. ⁽¹⁾	566,245	1.6%	566,245	–	–

(1) Based on information known to us and a Schedule 13D filed with the SEC on September 28, 2023. BioXcel LLC, a Delaware limited liability company, is a subsidiary of BioXcel Holdings, Inc., a Delaware corporation. BioXcel Holdings, Inc. is the beneficial owner of all of the shares held by BioXcel LLC. Vimal Mehta, Ph.D., our Chief Executive Officer and a member of our board of directors, is a manager and officer of BioXcel LLC, and a director and officer of BioXcel Holdings, Inc. As such, Dr. Mehta may be deemed to beneficially own the securities held of record by BioXcel LLC. Dr. Mehta disclaims any such beneficial ownership. The principal business address of BioXcel LLC and BioXcel Holdings, Inc. is 555 Long Wharf Drive New Haven, CT 06511.