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July 11, 2024

VIA EDGAR AND FEDERAL EXPRESS

United States Securities and Exchange Commission
Division of Corporation Finance
Office of Life Sciences
100 F. Street, N.E.
Washington, D.C. 20549
Attention: Christine Torney, Angela Connell, Jimmy McNamara, Alan Campbell

Re: MBX Biosciences, Inc.
Amendment No. 1 to Draft Registration Statement on Form S-1
Submitted April 26, 2024
CIK 0001776111

Dear Ladies and Gentlemen:

This letter is submitted on behalf of MBX Biosciences, Inc. (the "**Company**"), in response to the comments of the staff of the Division of Corporation Finance (the "**Staff**") of the U.S. Securities and Exchange Commission (the "**Commission**") with respect to the Company's Draft Registration Statement on Form S-1, originally confidentially submitted on March 22, 2024 (the "**Draft Registration Statement**"), and resubmitted on April 26, 2024 ("**Amendment No. 1 to the Draft Registration Statement**"), as set forth in the Staff's letter, dated May 7, 2024, addressed to P. Kent Hawryluk (the "**Comment Letter**"). The Company is concurrently confidentially submitting Amendment No. 2 to the Draft Registration Statement ("**Amendment No. 2**"), which includes changes to reflect responses to the Staff's comments and other updates.

For reference purposes, the text of the Comment Letter has been reproduced herein with responses below each numbered comment. For your convenience, we have italicized the reproduced Staff comments from the Comment Letter. Unless otherwise indicated, page references in the descriptions of the Staff's comments refer to Amendment No. 1 to the Draft Registration Statement, and page references in the responses refer to Amendment No. 2. All capitalized terms used and not otherwise defined herein shall have the meanings set forth in Amendment No. 2.

Amendment No. 1 to Draft Registration Statement on Form S-1

Prospectus Summary
Overview, page 1

1. *We note your response to prior comment 3 and re-issue in part. Please revise the Overview section of the Prospectus Summary to clarify that developing drug candidates is an "uncertain" process" and that you have not yet demonstrated the ability to gain regulatory approvals.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on pages 3 and 124 of Amendment No. 2 in response to the Staff's comment.

2. *We note your response to comment 5 and re-issue in part. Please revise your comparison of the preclinical results of MBX 4291 and tirzepatide to clarify that MBX 4291's results in clinical trials may not reflect your findings in preclinical studies.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on pages 2 and 122 of Amendment No. 2 in response to the Staff's comment.

3. *We note your response to prior comment 17 and revised disclosure. Please further revise your Summary disclosure comparing MBX 4291 and tirzepatide to reflect (i) your statements on page 144 indicating that it appears that less frequent dosing of MBX 4291 would require a higher dose than tirzepatide; (ii) the content of the graphic on page 144 showing that the concentration of the active component of MBX 4291 was significantly lower than the concentration of tirzepatide in the duration comparison; and (iii) that the study supporting the potential duration of MBX 4291 was conducted separately from studies evaluating its effects.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on pages 2 and 122 of Amendment No. 2 in response to the Staff's comment.

MBX 2109: Potential best-in-class treatment for chronic hypoparathyroidism, page 3

4. *We note your response to comment 9 and re-issue in part. Please provide balancing disclosure when Orphan Drug Designation is first introduced in the prospectus that it does not shorten the development time or regulatory review time of a product candidate and does not provide any guarantee of approval in the regulatory review or approval process.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on pages 4, 125 and 132 of Amendment No. 2 in response to the Staff's comment.

Our company and team, page 6

5. *We note your response to comment 8 and re-issue in part. Please revise to clarify, if true, Dr. DiMarchi is not an employee of your company. Please also disclose the number of hours per week, if any, that Dr. DiMarchi is required to devote to your company. Please also revise your disclosure on page 2 to clearly state whether you currently have any independent discovery capabilities or whether you are currently reliant on Dr. DiMarchi's discovery capabilities.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on pages 3, 7, 123 and 127 of Amendment No. 2 in response to the Staff's comment.

Business
Our solution: MBX 4291, page 141

6. *Please revise your narrative description of the graphic at the top of page 144 to disclose the range of concentrations of the (i) active component of MBX 4291 and (ii) tirzepatide, respectfully.*

RESPONSE: The Company acknowledges the Staff's comment and respectfully advises the Staff that it has revised the disclosure on page 145 of Amendment No. 2 in response to the Staff's comment.

If you should have any questions concerning the enclosed matters, please contact the undersigned at (212) 813-8853.

Sincerely,

/s/ Edwin M. O'Connor
Edwin M. O'Connor, Esq.

Enclosures

cc:

P. Kent Hawryluk, *MBX Biosciences, Inc.*
Richard Bartram, *MBX Biosciences, Inc.*
Mitchell S. Bloom, Esq., *Goodwin Procter LLP*
Daniel Hughes, Esq., *Goodwin Procter LLP*