

May 7, 2024

P. Kent Hawryluk
President and Chief Executive Officer
MBX Biosciences, Inc.
11711 N. Meridian Street, Suite 300
Carmel, Indiana 46032

Inc.

Draft Registration Statement on Form S-1
2024

Re: MBX Biosciences,
Amendment No. 1 to
Submitted April 26,
CIK No. 0001776111

Dear P. Kent Hawryluk:

We have reviewed your amended draft registration statement and have the following comments.

Please respond to this letter by providing the requested information and either submitting an amended draft registration statement or publicly filing your registration statement on EDGAR. If you do not believe a comment applies to your facts and circumstances or do not believe an amendment is appropriate, please tell us why in your response.

After reviewing the information you provide in response to this letter and your amended draft registration statement or filed registration statement, we may have additional comments. Unless we note otherwise, any references to prior comments are to comments in our April 17, 2024 letter.

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.

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.

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MBX Biosciences, Inc.
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Page 2

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) 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.
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.
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.
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.
Please contact Christine Torney at 202-551-3652 or Angela Connell at
202-551-3426 if you have questions regarding comments on the financial statements and related
matters. Please contact Jimmy McNamara at 202-551-7349 or Alan Campbell at 202-551-4224 with
any other questions.

FirstName LastNameP. Kent Hawryluk
Corporation Finance
Company NameMBX Biosciences, Inc.

Sciences
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cc: Edwin O Connor
FirstName LastName

Sincerely,
Division of
Office of Life