

October 6, 2017

VIA EDGAR

Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E. Washington, D.C. 20549
Attention: Office of Manufacturing and Construction

**Re: Yield10 Bioscience, Inc.
Forms 10-Q
For the Fiscal Quarters Ended March 31, 2017 and June 30, 2017**

Ladies and Gentlemen:

We are submitting this letter on behalf of Yield10 Bioscience, Inc. (the “**Company**”) in response to comments from the staff (the “**Staff**”) of the Securities and Exchange Commission (the “**Commission**”) received by letter dated October 2, 2017 (the “**Comment Letter**”) from the Division of Corporation Finance, Office of Manufacturing and Construction, to Charles B. Haaser, Chief Accounting Officer of the Company, relating to the above-referenced Forms 10-Q. In conjunction with this letter, the Company is filing the amended fully compiled Forms 10-Q for the fiscal quarters ended March 31, 2017 and June 30, 2017 on EDGAR (the “**Amended Forms 10-Q**”).

For convenient reference, we have set forth below in italics the Staff’s comments set forth in the Comment Letter with the Company’s corresponding response.

Comment:

Exhibit 31.2: Your certifications for both quarters refer to the “annual report on Form 10-K.” Please file a full amendment to revise the first paragraph of each certification to refer to the correct periodic report. We remind you that your amendments should include currently dated certifications that refer to the amended Forms 10-Q.

Response: The Staff’s comment is acknowledged, and the Company has filed full amendments to the Forms 10-Q for both quarters to revise the first paragraph of each currently dated certification as requested.

We hope that the above response and the related revisions reflected in the Amended Forms 10-Q will be acceptable to the Staff. Please do not hesitate to call me at (617) 542-6000 with any

Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C.

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comments or questions regarding the Amended Forms 10-Q and this letter. We thank you for your time and attention.

Sincerely,

/s/ Megan N. Gates

Megan N. Gates

cc:

Securities and Exchange Commission

W. John Cash

Yield10 Bioscience, Inc.

Charles B. Haaser

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