



October 11, 2019

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.
Registration Statement on Form S-1
Filed September 9, 2019
File No. 333-233683**

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, 2019 (the "**Comment Letter**") from the Division of Corporation Finance, Office of Manufacturing and Construction, to Dr. Oliver P. Peoples, President & Chief Executive Officer of the Company, relating to the above-referenced Registration Statement on Form S-1. In conjunction with this letter, the Company is filing the amended Registration Statement on Form S-1 (the "**Amended Form S-1**").

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:

General

- 1. Please file all non-Rule 430A information and all required exhibits not included in the initial registration statement.*

Response:

We have revised the disclosure to include all non-Rule 430A information and we have filed all required exhibits not included in the initial registration statement in response to this comment.

BOSTON LONDON LOS ANGELES NEW YORK SAN DIEGO SAN FRANCISCO WASHINGTON

October 11, 2019



We hope that the above response and the related revisions reflected in the Amended Form S-1 will be acceptable to the Staff. Please do not hesitate to call me at (617) 542-6000 with any comments or questions regarding the Amended Form S-1 and this letter. We thank you for your time and attention.

Sincerely,

/s/ Megan N. Gates
Megan N. Gates

cc:

Securities and Exchange Commission

Edward M. Kelly, Senior Counsel

Jay E. Ingram, Legal Branch Chief

Yield10 Bioscience, Inc.

Dr. Oliver P. Peoples, CEO