

Yield10 Bioscience, Inc.
19 Presidential Way
Woburn, Massachusetts 01801

March 31, 2021

VIA EDGAR

U.S. Securities and Exchange Commission
Division of Corporation Finance
100 F Street, N.E.
Washington, D.C. 20549

Attention: Charles Eastman, Staff Accountant

Re: Yield10 Bioscience, Inc.
Registration Statement on Form S-3
File No. 333-254830
Request for Acceleration

Dear Mr. Eastman:

Pursuant to Rule 461 of Regulation C promulgated under the Securities Act of 1933, as amended, Yield10 Bioscience, Inc. (the "Registrant") hereby requests acceleration of the effective date of its Registration Statement on Form S-3 (File No. 333-254830), so that it may become effective at 12:00 p.m. (Washington, D.C. time) on April 2, 2021, or as soon thereafter as practicable.

Please call Megan Gates, of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., counsel to the Registrant, at (617) 348-4443 with any comments or questions regarding this matter.

Very truly yours,

Yield10 Bioscience, Inc.

By: /s/ Charles B. Haaser

Name: Charles B. Haaser
Title: Vice President, Finance, Chief Accounting
Officer and Treasurer

cc: *Yield10 Bioscience, Inc.*

Oliver P. Peoples, Ph.D.

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

Megan N. Gates, Esq.