



April 2, 2024

Dear Stockholder:

You are cordially invited to attend a special meeting (the “Special Meeting”) of stockholders of Yield10 Bioscience, Inc. (the “Company”), to be held at 9:00 a.m. Eastern Time on April 26, 2024, in virtual-only format.

We will hold the Special Meeting virtually via live audio webcast on the Internet. We believe hosting a virtual meeting enables greater stockholder attendance and participation from any location around the world, improves meeting efficiency and our ability to communicate effectively with our stockholders, and reduces the cost and environmental impact of the Special Meeting. You will be able to attend the Special Meeting, vote and submit your questions during the meeting by pre-registering at <https://viewproxy.com/yield10bio/2024/>. You will not be able to attend the Special Meeting in person.

Details regarding the Special Meeting, the business to be conducted at the Special Meeting, and information about the Company that you should consider when you vote your shares are described in this proxy statement. You may obtain additional information about the Company from documents we file with the Securities and Exchange Commission.

At the Special Meeting, we will ask stockholders to approve:

1. A proposed amendment to the Yield10 Bioscience, Inc. Amended and Restated Certificate of Incorporation, as amended, to effect a reverse stock split of our issued and outstanding shares of common stock, at a ratio of between 1-for-5 and 1-for-25 (“Proposal 1”); and
2. Adjournment of the Special Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 1 (“Proposal 2”).

The Board of Directors recommends that you vote “FOR” each of these proposals.

We hope you will be able to attend the Special Meeting. Whether or not you plan to attend the Special Meeting, we urge you to complete, sign, date and mail promptly the enclosed proxy which is being solicited on behalf of the Board of Directors so that your shares will be represented at the Special Meeting. A return envelope, which requires no postage if mailed in the United States, is enclosed for that purpose. You need to vote in accordance with the instructions listed on the proxy card. If shares are held in a bank or brokerage account, you may be eligible to vote electronically or by telephone. Please refer to the enclosed voting instruction form for instructions. If you attend the Special Meeting, you may vote during the live webcast, provided that you have registered at <https://viewproxy.com/yield10bio/2024/>, even if you have previously returned your proxy card. Your prompt cooperation will be greatly appreciated.

Sincerely,

A handwritten signature in black ink, appearing to read 'Oliver P. Peoples', is written over a horizontal line.

Oliver P. Peoples
President and Chief Executive Officer

YIELD10 BIOSCIENCE, INC.

**19 Presidential Way
Woburn, Massachusetts 01801
(617) 583-1700**

NOTICE OF SPECIAL MEETING OF STOCKHOLDERS

TIME: 9:00 a.m. Eastern Time

DATE: April 26, 2024

MEETING FORMAT: The Special Meeting will be a virtual meeting via live audio webcast on the Internet. Stockholders who wish to attend the Special Meeting must pre-register at <https://viewproxy.com/yield10bio/2024/by> 11:59 p.m. Eastern Time, on April 25, 2024. You will receive an event passcode to attend the meeting, and a virtual control number to vote if proper documentation is provided. The live audio webcast of the Special Meeting can be accessed by stockholders on the day of the meeting by clicking on the link you have received in your e-mail confirmations. You will not be able to attend the Special Meeting in person.

We believe hosting a virtual meeting enables greater stockholder attendance and participation from any location around the world, improves meeting efficiency and our ability to communicate effectively with our stockholders. It also reduces the cost and environmental impact of the Special Meeting. Both stockholders of record and street name stockholders will be able to attend the Special Meeting via live audio webcast, submit their questions during the meeting and vote their shares electronically at the Special Meeting.

There will be technicians ready to assist you with any technical difficulties you may have accessing the Special Meeting live audio webcast. Please be sure to check in by 8:30 a.m. Eastern Time, on April 26, 2024 (at least 15 minutes prior to the start of the meeting is recommended) the day of the meeting, so that any technical difficulties may be addressed before the Special Meeting live audio webcast begins. If you encounter any difficulties accessing the webcast during the check-in or meeting time, please email virtualmeeting@viewproxy.com or call 866-612-8937.

PURPOSE: To approve:

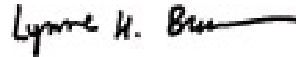
1. A proposed amendment to the Yield10 Bioscience, Inc. Amended and Restated Certificate of Incorporation, as amended (the "Certificate of Incorporation"), to effect a reverse stock split of our issued and outstanding shares of common stock, at a ratio of between 1-for-5 and 1-for-25 ("Proposal 1"); and
2. Adjournment of the Special Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 1 ("Proposal 2").

WHO MAY VOTE:

Only stockholders of record at the close of business on April 1, 2024, are entitled to notice of and to vote at the Special Meeting and at any adjournment or postponement thereof.

All stockholders are cordially invited to attend the Special Meeting. **However, to assure your representation at the Special Meeting, we urge you, whether or not you plan to attend the Special Meeting, to complete, sign, date and mail promptly the enclosed proxy card, which is being solicited on behalf of the Board of Directors so that your shares will be represented at the Special Meeting.** A return envelope which requires no postage if mailed in the United States is enclosed for that purpose. You need to vote in accordance with the instructions listed on the proxy card. If shares are held in a bank or brokerage account, you may be eligible to vote electronically or by telephone. Please refer to the enclosed voting instruction form for instructions. If you attend the Special Meeting, you may vote during the live webcast, provided that you have registered at <https://viewproxy.com/yield10bio/2024/> even if you have previously returned your proxy card.

BY ORDER OF THE BOARD OF DIRECTORS

A handwritten signature in black ink, appearing to read "Lynne H. Brum", with a long horizontal flourish extending to the right.

Lynne H. Brum
Secretary

WHETHER OR NOT YOU EXPECT TO ATTEND THE SPECIAL MEETING, PLEASE COMPLETE, SIGN, DATE AND MAIL PROMPTLY THE ENCLOSED PROXY CARD WHICH IS BEING SOLICITED ON BEHALF OF THE BOARD OF DIRECTORS SO THAT YOUR SHARES WILL BE REPRESENTED AT THE SPECIAL MEETING. A RETURN ENVELOPE, WHICH REQUIRES NO POSTAGE IF MAILED IN THE UNITED STATES, IS ENCLOSED FOR THAT PURPOSE. YOU NEED TO VOTE IN ACCORDANCE WITH THE INSTRUCTIONS LISTED ON THE PROXY CARD. IF SHARES ARE HELD IN A BANK OR BROKERAGE ACCOUNT, YOU MAY BE ELIGIBLE TO VOTE ELECTRONICALLY OR BY TELEPHONE. PLEASE REFER TO THE ENCLOSED VOTING INSTRUCTION FORM FOR INSTRUCTIONS.

PRELIMINARY COPIES FILED PURSUANT TO RULE 14a-6(a)

**YIELD10 BIOSCIENCE, INC.
19 Presidential Way
Woburn, Massachusetts 01801**

**PROXY STATEMENT FOR THE YIELD10 BIOSCIENCE, INC.
SPECIAL MEETING OF STOCKHOLDERS TO BE HELD ON April 26, 2024**

This proxy statement, along with the accompanying Notice of the Special Meeting of Stockholders, contains information about the Special Meeting of Stockholders of Yield10 Bioscience, Inc., including any adjournments or postponements thereof (the “Special Meeting”). We are holding the Special Meeting at 9:00 a.m. Eastern Time, on April 26, 2024 in a virtual format. You may attend the Special Meeting by accessing the link provided in your email confirmation when you registered.

In this proxy statement, we refer to Yield10 Bioscience, Inc. as “Yield10,” “Yield10 Bioscience,” “the Company,” “we” and “us.”

This proxy statement relates to the solicitation of proxies by our Board of Directors for use at the Special Meeting.

On or about April 3, 2024, we intend to begin sending this proxy statement, the attached Notice of Special Meeting of Stockholders and the enclosed proxy card to all stockholders entitled to vote at the Special Meeting.

YIELD10 BIOSCIENCE, INC.

**19 Presidential Way
Woburn, Massachusetts 01801**

PROXY STATEMENT

**For a Special Meeting of Stockholders
To Be Held on April 26, 2024**

Proxies in the form enclosed with this proxy statement are solicited by the Board of Directors of Yield10 Bioscience, Inc., a Delaware corporation (“Yield10” or the “Company”), for use at the Special Meeting of Stockholders of Yield10 to be held on April 26, 2024, at 9:00 a.m., Eastern Time, or at any adjournments or postponements thereof (the “Special Meeting”) in virtual-only format at <https://viewproxy.com/yield10bio/2024/>.

The purpose of the Special Meeting is to ask stockholders to approve:

1. A proposed amendment to our Certificate of Incorporation to effect a reverse stock split of our issued and outstanding shares of common stock, at a ratio of between 1-for-5 and 1-for-25 (“Proposal 1”); and
2. Adjournment of the Special Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 1 (“Proposal 2”).

Only stockholders of record at the close of business on April 1, 2024 (the “Record Date”) will be entitled to receive notice of and to vote at the Special Meeting. As of the Record Date, 15,401,706 shares of common stock were issued, outstanding and entitled to vote.

VOTING AND OTHER INFORMATION

How Do I Attend the Special Meeting?

The Special Meeting will be held in a virtual meeting format only, with no physical in-person meeting. The Special Meeting will be held via live audio webcast on the Internet on April 26, 2024, starting at 9:00 a.m. Eastern Time. We have designed our virtual format to enhance, rather than constrain stockholder access, participation and communication. Stockholders may attend the Special Meeting by registering at <https://viewproxy.com/yield10bio/2024/>. Stockholders may vote and submit questions while connected to the Special Meeting. You need not attend the Special Meeting in order to vote.

In order to attend the Special Meeting, you must register in advance at <https://viewproxy.com/yield10bio/2024/> prior to the deadline of April 25, 2024 at 11:59 p.m. Eastern Time. Upon completing your registration, you will receive further instructions via email, including your unique link that will allow you to access the Special Meeting, vote online during the Special Meeting and will permit you to submit questions during the Special Meeting. You will also be permitted to submit questions at the time of registration. You may ask questions that are confined to matters properly presented at the Special Meeting and of general Company concern. The live audio webcast of the Special Meeting can be accessed by stockholders on the day of the meeting at <https://viewproxy.com/yield10bio/2024/>.

The Special Meeting will begin promptly at 9:00 a.m. Eastern Time. We encourage you to access the Special Meeting prior to the start time. Please be sure to check in by 8:30 a.m. Eastern Time, on April 26, 2024 (at least 15 minutes prior to the start of the meeting is recommended) the day of the meeting, so that any technical difficulties may be addressed before the Special Meeting live audio webcast begins. We recommend that you carefully review the procedures needed to gain admission in advance. There will be technicians ready to assist you with any technical difficulties you may have accessing the Special Meeting live audio webcast. If you encounter any difficulties accessing the webcast during the check-in or meeting time, please email virtualmeeting@viewproxy.com or call 866-612-8937.

Who May Vote?

The holders of common stock are entitled to one vote per share on any proposal to be presented at the Special Meeting. Stockholders may vote during the live webcast, provided that they have registered at <https://viewproxy.com/yield10bio/2024/>, or by proxy. Stockholders may vote by proxy by completing, signing, dating and returning the accompanying proxy card in the prepaid postage envelope enclosed for that purpose in accordance with the instructions listed on the proxy card. Execution of a proxy will not in any way affect a stockholder's right to attend the Special Meeting and vote during the live webcast.

Any proxy given pursuant to this solicitation may be revoked by the person giving it any time before the taking of the vote at the Special Meeting. Proxies may be revoked by (1) filing with the Secretary of Yield10, before the taking of the vote at the Special Meeting, a written notice of revocation bearing a later date than the proxy, (2) duly executing a later-dated proxy relating to the same shares and delivering it to the Secretary of Yield10, in accordance with the instructions listed on the proxy card, before the taking of the vote at the Special Meeting, (3) if shares are held in a bank or brokerage account and if eligible, by transmitting a subsequent vote over the Internet or by telephone, or (4) attending the Special Meeting and voting during the live webcast, provided that you have registered at <https://viewproxy.com/yield10bio/2024/>, after which you will receive further instructions via email, including your unique link that will allow you access to the special meeting and to submit questions during the special meeting (although attendance at the Special Meeting will not in and of itself constitute a revocation of a proxy). Any written notice of revocation or subsequent proxy should be sent to Yield10 Bioscience, Inc., 19 Presidential Way, Woburn, MA 01801, Attention: Secretary, so as to be delivered before the taking of the vote at the Special Meeting. Telephone and Internet voting facilities for stockholders of record will be available 24 hours a day and will close at 11:59 p.m. Eastern Time on April 25, 2024.

If your shares are registered in your name with our transfer agent, Equiniti Trust Company, LLC, or if you have stock certificates, they will not be counted if you do not vote as described above. If your shares are held by a broker on your behalf (that is, in "street name"), you may be required to present an account statement or letter from your bank or brokerage firm showing that you are the beneficial owner of the shares as of the Record Date in order to be admitted to the Special Meeting. To be able to vote your shares held in street name at the Special Meeting, you will need to obtain a proxy from the holder of record.

The persons named as attorneys-in-fact in the proxies, Oliver P. Peoples and Charles B. Haaser, were selected by the Board of Directors and are officers of the Company. All properly executed proxies returned in time to be counted at the Special Meeting will be voted by such persons at the Special Meeting as stated below. When a choice has been specified on the proxy with respect to a matter, the shares represented by the proxy will be voted in accordance with the specifications. If a proxy is submitted without giving voting instructions, such shares will be voted in accordance with the Board of Directors' recommendation as noted below.

The Board of Directors recommends that you vote "FOR" each of Proposal 1 and Proposal 2.

The representation in person or by proxy of at least a majority of the outstanding shares of common stock entitled to vote at the Special Meeting is necessary to constitute a quorum for the transaction of business. Abstentions are counted as present or represented for purposes of determining the presence or absence of a quorum for the Special Meeting, and will have no effect with respect to the voting results for Proposal 1 or Proposal 2.

Under applicable exchange rules, brokers, banks and other securities intermediaries may use their discretion to vote your "uninstructed" shares with respect to matters considered to be "routine." Proposals 1 and 2 are considered to be "routine" matters under such rules, meaning that if you do not return voting instructions to your broker, bank or other agent by its deadline, your shares may be voted by your broker, bank or other agent in its discretion on Proposal 1 or Proposal 2. As such, if your shares are held in street name, and you do not instruct the broker as to how to vote your shares on Proposal 1 or Proposal 2, the broker will have discretion to vote for or against either or both proposals. If a broker chooses not to exercise such discretion, this would result in a broker "non-vote", although we do not anticipate any broker non-votes, and such broker non-votes will have no effect on the results of either Proposal. **Please vote your proxy so your vote can be counted.**

Why is the Company seeking approval for these proposals?

Proposal 1. Reverse Stock Split. On September 25, 2023, we received a notification letter from the Listing Qualifications Department of The Nasdaq Stock Market (“Nasdaq”) informing us that for the prior 30 consecutive business days, the bid price of our securities had closed below \$1.00 per share as required by Nasdaq Listing Rule 5550(a)(2) (the “Minimum Bid Price Requirement”). This notice had no immediate effect on our Nasdaq listing, and we were given 180 calendar days, or until March 25, 2024, to regain compliance.

On February 6, 2024, we participated in a hearing before the Nasdaq Hearings Panel, subsequent to which we were granted an extension until May 13, 2024, subject to certain conditions, to regain compliance with the Minimum Bid Price Requirement.

As of March 26, 2024, we had not regained compliance with the Minimum Bid Price Requirement since the closing bid price of our securities was not at least \$1.00 per share for a minimum of ten consecutive business days. To cure the deficiency, we intend to conduct the reverse stock split of our common stock for which we are seeking stockholder approval in this proxy statement. On April 1, 2024, the closing price of our common stock as reported on Nasdaq was \$0.38 per share.

The Board of Directors has approved the reverse stock split as a potential means of increasing the share price of our common stock and may choose to implement it if other options are unavailable, undesirable or insufficient. Our Board of Directors believes that maintaining our listing on Nasdaq may provide a broader market for our common stock and facilitate the use of our common stock in financing and other transactions. We expect the reverse stock split, if effected, to facilitate the continuation of such listing. We cannot assure you, however, that the reverse stock split, if effected, will result in an increase in the per share price of our common stock, or if it does, how long the increase would be sustained, if at all. Although the reverse stock split is designed to raise the stock price, there is no guarantee that the share price will rise proportionately to the reverse stock split, so the end result could be a loss of value.

We currently have 60,000,000 authorized shares of common stock. The approval of the reverse stock split will result in a lower number of issued and outstanding shares as compared to the number of our authorized shares, which would provide additional shares available for use as the Board of Directors deems appropriate or necessary.

If our stockholders approve Proposal 1, the Board of Directors in its sole discretion will determine whether to effect the reverse stock split, no later than July 31, 2024. For more information, see “Proposal 1” contained elsewhere in this proxy statement.

Proposal 2. Adjournment of Special Meeting. We may determine that an adjournment of the Special Meeting is necessary to solicit additional proxies if there are not sufficient votes in favor of Proposal 1. For more information, see “Proposal 2” contained later in this proxy statement.

What are the costs of soliciting these proxies?

We will pay all of the costs of soliciting these proxies. In addition, our directors and employees may solicit proxies in person or by telephone or email. We will pay these employees and directors no additional compensation for these services. We will ask banks, brokers and other institutions, nominees and fiduciaries to forward these proxy materials to their principals and to obtain authority to execute proxies. We will then reimburse them for their expenses. If Yield10 does retain a proxy solicitation firm, Yield10 would pay such firm's customary fees and expenses, which fees would be expected not to exceed \$15,000 plus expenses.

Vote Required

Proposal 1: Reverse Stock Split. The affirmative vote of a majority of votes cast affirmatively or negatively on this proposal is required to approve the amendment to our Certificate of Incorporation to effect a reverse stock split of our common stock. Abstentions have no effect on the vote for this proposal. Brokerage firms will have authority to vote customers' unvoted shares held by the firms in street name on this proposal. If that authority is not exercised, any resulting broker non-votes will have no effect on the vote for this proposal.

Proposal 2. Adjournment of Special Meeting. The affirmative vote of a majority of votes cast affirmatively or negatively on this proposal is required to approve the adjournment of the Special Meeting. Abstentions will have no effect on the results of this vote. Brokerage firms will have authority to vote customers' unvoted shares held by the firms in street name on this proposal. If that authority is not exercised, any resulting broker non-votes will have no effect on the results of the vote.

Where Can I Find the Voting Results of the Special Meeting?

The preliminary voting results will be announced at the Special Meeting, and we will publish preliminary, or final results if available, in a Current Report on Form 8-K within four business days of the Special Meeting. If final results are unavailable at the time we file the Form 8-K, then we will file an amended report on Form 8-K to disclose the final voting results within four business days after the final voting results are known.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth certain information with respect to the beneficial ownership of our common stock as of March 28, 2024 for (a) our named executive officers, (b) our directors, (c) our executive officers and directors as a group, and (d) each stockholder known to us to beneficially own more than five percent of our common stock. Beneficial ownership is determined in accordance with the rules of the SEC and includes voting or investment power with respect to the securities. We deem shares that may be acquired by an individual or group within 60 days following March 28, 2024, pursuant to the exercise of options or warrants to be outstanding for the purpose of computing the percentage ownership of such individual or group, but not for the purpose of computing the percentage ownership of any other person shown in the table. Except as otherwise indicated, we believe that the stockholders named in the table have sole voting and investment power with respect to all shares shown to be beneficially owned by them based on information provided to us by these stockholders. Percentage ownership is based on a total of 15,401,706 shares of our common stock issued and outstanding on March 28, 2024. Unless otherwise noted below, the address of each person listed on the table is c/o Yield10 Bioscience, Inc., 19 Presidential Way, Woburn, MA 01801.

Category	Beneficial Owner	Shares of common stock ⁽¹⁾	Options Exercisable Within 60 Days ⁽²⁾	Warrants Exercisable Within 60 Days ⁽²⁾	Total Shares Beneficially Owned	Percentage of Outstanding Shares ⁽³⁾
5% Stockholders	Jack W. Schuler ⁽⁴⁾ 100 N. Field Drive Suite 360 Lake Forest, IL 60045	1,600,976	—	1,494,945	3,095,921	18.3%
Directors and Named Executive Officers	Lynne H. Brum ⁽⁵⁾	39,998	61,281	—	101,279	*
	Oliver P. Peoples ⁽⁶⁾	74,181	257,812	—	331,993	2.1%
	Kristi Snell ⁽⁷⁾	41,034	108,218	—	149,252	1.0%
	Sherri Brown	—	22,437	—	22,437	*
	Richard Hamilton	72,598	13,223	—	85,821	*
	Willie Loh	—	7,500	—	7,500	*
	Anthony J. Sinskey ⁽⁸⁾	64,274	35,723	—	99,997	*
	Robert L. Van Nostrand	48,635	27,199	—	75,834	*
All directors and executive officers as a group (9 persons) ⁽⁹⁾		381,581	594,680	—	976,261	6.1%

* Less than 1.0%.

- (1) Beneficial ownership, as such term is used herein, is determined in accordance with Rule 13d-3(d)(1) promulgated under the Securities Exchange Act of 1934, as amended, and includes voting and/or investment power with respect to shares of our common stock. Unless otherwise indicated, the named person possesses sole voting and investment power with respect to the shares.
- (2) Consists of shares of common stock subject to stock options and warrants held by the person that are currently vested or will vest within 60 days after March 28, 2024.
- (3) Percentages of ownership are based upon 15,401,706 shares of common stock issued and outstanding as of March 28, 2024. Shares of common stock that may be acquired pursuant to options and warrants that are vested and exercisable within 60 days after March 28, 2024, are deemed outstanding for computing the percentage ownership of the person holding such options, but are not deemed outstanding for the percentage ownership of any other person.
- (4) The reported securities consist of 1,566,956 shares of common stock and 1,494,945 shares of common

stock underlying the warrants owned by the JWS Living Trust, 33,999 shares of common stock owned by the Schuler Education Foundation, and 21 shares of common stock owned by the Renate Schuler Trust. Mr. Schuler has sole voting and investment power over the shares issued to the JWS Living Trust, the Schuler Family Foundation and Renate Schuler Trust. Beneficial ownership information for Mr. Schuler has been derived from his historical SEC filings.

- (5) Includes 31,672 shares held for Ms. Brum in the Company's 401(k) plan.
- (6) Includes 35,873 shares held for Dr. Peoples in the Company's 401(k) plan.
- (7) Includes 31,996 shares held for Dr. Snell in the Company's 401(k) plan.
- (8) Includes 20 shares owned by the estate of Dr. Sinskey's spouse and 4 shares owned by a trust over which Dr. Sinskey may be deemed to share voting and investment power. Dr. Sinskey disclaims beneficial ownership of such shares.
- (9) Includes Charles B. Haaser, who is an executive officer but not a named executive officer. Also includes a total of 30,559 shares held for Mr. Haaser in the Company's 401(k) plan.

PROPOSAL 1
REVERSE STOCK SPLIT
(Notice Item 1)

General

At the Special Meeting of stockholders, holders of our common stock are being asked to approve the amendment to our Certificate of Incorporation to effect a reverse stock split of the issued and outstanding shares of common stock (such split to combine a number of outstanding shares of our common stock between five (5) and twenty-five (25), such number consisting of only whole shares, into one (1) share of common stock). The full text of the proposed amendment to our Certificate of Incorporation is attached to this proxy statement as Appendix B.

If approved by the stockholders, the reverse stock split would become effective at a time, and at a ratio, to be designated by the Board of Directors. The Board of Directors may effect only one reverse stock split as a result of this authorization. The Board of Directors' decision as to when to effect the reverse stock split will be based on a number of factors, including market conditions, existing and expected trading prices for our common stock, and the continued listing requirements of The Nasdaq Capital Market ("Nasdaq"). Even if the stockholders approve the reverse stock split, we reserve the right not to effect the reverse stock split if the Board of Directors does not deem it to be in the best interests of us and our stockholders to effect the reverse stock split. The reverse stock split, if authorized pursuant to this resolution and if deemed by the Board of Directors to be in the best interests of us and our stockholders, will be effected at a time that is not later than July 31, 2024.

Purpose

The Board of Directors has approved the proposal authorizing the reverse stock split for the following reasons:

- the Board of Directors believes that effecting the reverse stock split may be an effective means of regaining compliance with the bid price requirement for the continued listing of our common stock on Nasdaq;
- the Board of Directors believes that the reverse stock split may potentially make our common stock a more attractive investment to institutional investors and/or broaden the pool of investors that may be interested in investing in our company by attracting new investors who would prefer not to invest in shares that trade at lower share prices;
- the Board of Directors believes that it is in the best interest of the Company to have a number of shares available for issuance in future financings and for other purposes; and
- the Board of Directors believes that a higher stock price may help generate investor interest in us, including interest among institutional investors.

If the reverse stock split successfully increases the per share price of our common stock and facilitates the continued listing of our common stock on Nasdaq, as to which no assurance can be given, the Board of Directors believes this increase may facilitate future financings, enhance our ability to transact with our securities and increase the interest of third parties with whom we may be negotiating for purposes of evaluating potential strategic alternatives.

Nasdaq Requirements for Continued Listing

Our common stock is listed on Nasdaq under the symbol "YTEN." One of the requirements for continued listing on Nasdaq is maintenance of a minimum closing bid price of \$1.00 per share. On April 1, 2024, the closing market price per share of our common stock was \$0.38, as reported by Nasdaq.

On September 25, 2023, we received a notification letter from Nasdaq informing us that for the last 30 consecutive business days, the bid price of our securities had closed below \$1.00 per share as required by

Nasdaq Listing Rule 5550(a)(2). This notice has no immediate effect on our Nasdaq listing, and we were granted 180 calendar days, or until March 25, 2024, to regain compliance with this requirement. On February 6, 2024, we participated in a hearing before the Nasdaq Hearings Panel, subsequent to which we were granted an extension until May 13, 2024, subject to certain conditions, to regain compliance with the Minimum Bid Price Requirement.

As of March 26, 2024, we had not regained compliance with the Minimum Bid Price Requirement, since the closing bid price of our securities had not been at least \$1.00 per share for a minimum of ten consecutive business days. To cure the deficiency, we intend to conduct the reverse stock split of our common stock for which we are seeking stockholder approval in this proxy statement.

Even after we implement the reverse stock split for which we are seeking approval, we cannot assure you that our share price will comply with the requirements for continued listing of our common stock on Nasdaq in the future or that we will comply with the other continued listing requirements. If our common stock is delisted from Nasdaq, our common stock would likely trade in the over-the-counter market.

If our shares were to trade on the over-the-counter market, selling our common stock could be more difficult because smaller quantities of shares would likely be bought and sold, and transactions could be delayed. In addition, in the event our common stock is delisted, broker-dealers have certain regulatory burdens imposed upon them, which may discourage broker-dealers from effecting transactions in our common stock, further limiting the liquidity of our common stock. These factors could result in lower prices and larger spreads in the bid and ask prices for our common stock.

Such delisting from Nasdaq and continued or further declines in our share price could also greatly impair our ability to raise additional necessary capital through equity or debt financing and could significantly increase the ownership dilution to stockholders caused by our issuing equity in financing or other transactions.

In light of the factors mentioned above, our Board of Directors approved the reverse stock split as a potential means of increasing the share price of our common stock above \$1.00 per share and of maintaining the share price of our common stock above \$1.00 per share in compliance with Nasdaq requirements.

Authorized Shares of Common Stock

We are currently authorized under our Certificate of Incorporation to issue up to a total of 65,000,000 shares of capital stock, comprised of 60,000,000 shares of common stock and 5,000,000 shares of preferred stock. While the reverse stock split would decrease the number of outstanding shares of our common stock, it would not change the number of authorized shares under our Certificate of Incorporation. Consequently, the reverse stock split would have the effect of increasing the number of shares of common stock available for issuance under our Certificate of Incorporation. Our Board of Directors believes that such an increase is in our and our stockholders' best interests, as it would provide us with greater flexibility to issue shares of common stock in connection with possible future financings as under our equity incentive plans and for other general corporate purposes.

As of March 28, 2024, there were 15,401,706 shares of our common stock outstanding. Assuming a 1-for-5 reverse stock split is effected, there will be approximately 3,080,341 shares outstanding. Assuming a 1-for-25 reverse stock split is effected, there will be approximately 616,068 shares outstanding.

Potential Increased Investor Interest

In approving the proposal authorizing the reverse stock split, the Board of Directors considered that our common stock may not appeal to brokerage firms that are reluctant to recommend lower priced securities to their clients. Investors may also be dissuaded from purchasing lower priced stocks because the brokerage commissions, as a percentage of the total transaction, tend to be higher for such stocks. Moreover, the analysts at many brokerage firms do not monitor the trading activity or otherwise provide coverage of lower priced stocks.

There are risks associated with the reverse stock split, including that the reverse stock split may not result in a sustained increase in the per share price of our common stock.

We cannot predict whether the reverse stock split will increase the market price for our common stock on a sustained basis. The history of similar stock split combinations for companies in like circumstances is varied. There is no assurance that:

- the market price per share of our common stock after the reverse stock split will rise in proportion to the reduction in the number of shares of our common stock outstanding before the reverse stock split;
- the reverse stock split will result in a per share price that will attract brokers and investors who do not trade in lower priced stocks;
- our ability to conduct future financings will be enhanced; and
- the market price per share will either exceed or remain in excess of the \$1.00 minimum bid price as required by Nasdaq, or that we will otherwise meet the requirements of Nasdaq for continued listing inclusion for trading on Nasdaq.

The market price of our common stock will also be based on our performance and other factors, some of which are unrelated to the number of shares outstanding. If the reverse stock split is effected and the market price of our common stock declines, the percentage decline as an absolute number and as a percentage of our overall market capitalization may be greater than would occur in the absence of a reverse stock split. Furthermore, the liquidity of our common stock could be adversely affected by the reduced number of shares that would be outstanding after the reverse stock split.

Principal Effects of the Reverse Stock Split

If the stockholders approve the proposal to authorize the Board of Directors to implement the reverse stock split and the Board of Directors implements the reverse stock split, we will amend our Certificate of Incorporation by replacing the second paragraph of Article IV with the following:

["Upon effectiveness of this Certificate of Amendment (the "Effective Time"), the shares of Common Stock issued and outstanding immediately prior to the Effective Time and the shares of Common Stock issued and held in the treasury of the Corporation immediately prior to the Effective Time are reclassified into a smaller number of shares such that each [] shares of issued Common Stock immediately prior to the Effective Time is reclassified into one (1) share of Common Stock. Notwithstanding the immediately preceding sentence, no fractional shares shall be issued as a result of the reverse stock split. Instead, any stockholder who would otherwise be entitled to a fractional share of our Common Stock as a result of the reclassification shall be entitled to receive a cash payment equal to the product of such resulting fractional interest in one share of our Common Stock multiplied by the closing trading price of our Common Stock on the trading day immediately preceding the effective date of the reverse stock split. Notwithstanding the foregoing, the Corporation shall not be obliged to issue certificates evidencing the shares of Common Stock outstanding as a result of the reverse stock split or cash in lieu of fractional shares, if any, unless and until the certificates evidencing the shares held by a holder prior to the reverse stock split are either delivered to the Corporation or its transfer agent, or the holder notifies the Corporation or its transfer agent that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection with such certificates."]

Upon effectiveness of the reverse stock split, we would adjust and proportionately decrease the number of shares of our common stock reserved for issuance upon exercise of, and adjust and proportionately increase the exercise price of, all options and warrants and other rights to acquire our common stock. In addition, as of the effective time of the reverse stock split, we would adjust and proportionately decrease the total number of shares of our common stock that may be the subject of the future grants under our stock plans. The reverse stock split will be effected simultaneously for all issued and outstanding shares of common stock, and the exchange ratio will be the same for all issued and outstanding shares of common stock. The reverse stock split will affect all of our stockholders uniformly and will not affect any stockholder's percentage ownership interests in the Company, except to the extent that cash payments are made in lieu of fractional shares. Common stock issued pursuant to the reverse stock split will remain fully paid and nonassessable. The reverse stock split will not affect the Company continuing to be subject to the periodic reporting

requirements of the Exchange Act. Following the reverse stock split, our common stock will continue to be listed on Nasdaq, under the symbol “YTEN,” although it would receive a new CUSIP number.

By approving this amendment, stockholders will approve the combination of any whole number of shares of common stock between and including five (5) and twenty-five (25) into one (1) share. The certificate of amendment to be filed with the Secretary of State of the State of Delaware will include only that number determined by the Board of Directors to be in the best interests of the Company and its stockholders. The Board of Directors will not implement any amendment providing for a different split ratio.

Procedure for Effecting Reverse Stock Split and Exchange of Stock Certificates

If the certificate of amendment is approved by our stockholders, and if at such time the Board of Directors still believes that a reverse stock split is in the best interests of the Company and its stockholders, the Board of Directors will determine the ratio of the reverse stock split to be implemented. We will file the certificate of amendment with the Secretary of State of the State of Delaware at such time as the Board of Directors has determined the appropriate effective time for the reverse stock split. The Board of Directors may delay effecting the reverse stock split, if at all, until a time that is not later than July 31, 2024, without re-soliciting stockholder approval. The reverse stock split will become effective on the date of filing of the certificate of amendment with the Secretary of State of the State of Delaware. Beginning on the effective date of the split, each certificate representing pre-split shares will be deemed for all corporate purposes to evidence ownership of post-split shares.

Book-Entry Shares

If the reverse stock split is effected, stockholders who hold uncertificated shares (i.e., shares held in book-entry form and not represented by a physical stock certificate), either as direct or beneficial owners, will have their holdings electronically adjusted automatically by our transfer agent (and, for beneficial owners, by their brokers or banks that hold in “street name” for their benefit, as the case may be) to give effect to the reverse stock split. Stockholders who hold uncertificated shares as direct owners will be sent a statement of holding from our transfer agent that indicates the number of post-reverse stock split shares of our common stock owned in book-entry form.

Certificated Shares

As soon as practicable after the effective date of the split, our stockholders will be notified that the reverse stock split has been effected. We expect that our transfer agent will act as exchange agent for purposes of implementing the exchange of stock certificates. Holders of pre-split shares will be asked to surrender to the exchange agent certificates representing pre-split shares in exchange for certificates representing post-split shares in accordance with the procedures to be set forth in a letter of transmittal to be sent by us or our exchange agent. No new certificates will be issued to a stockholder until such stockholder has surrendered such stockholder’s outstanding certificate(s) together with the properly completed and executed letter of transmittal to the exchange agent. Any pre-split shares submitted for transfer, whether pursuant to a sale or other disposition, or otherwise, will automatically be exchanged for post-split shares. STOCKHOLDERS SHOULD NOT DESTROY ANY STOCK CERTIFICATE(S) AND SHOULD NOT SUBMIT ANY CERTIFICATE(S) UNTIL REQUESTED TO DO SO.

Fractional Shares

No fractional shares will be issued in connection with the reverse stock split. Stockholders of record on the effective date of the split who otherwise would be entitled to receive fractional shares because they hold a number of pre-split shares not evenly divisible by the number of pre-split shares for which each post-split share is to be exchanged, will in lieu of a fractional share, be entitled upon surrender to the exchange agent of certificates representing such pre-split shares, if any, to receive payment in cash in lieu of any such resulting fractional shares of common stock as the post-reverse split amounts of common stock will be rounded down to the nearest full share. Such cash payment in lieu of a fractional share of common stock will be calculated by multiplying such fractional interest in one share of common stock by the closing trading

price of our common stock on the trading day immediately preceding the effective date of the reverse stock split, and rounded to the nearest cent. No fractional shares will be issued in connection with the reverse stock split.

Accounting Matters

The reverse stock split will not affect the common stock capital account on our balance sheet. However, because the par value of our common stock will remain unchanged on the effective date of the split, the components that make up the common stock capital account will change by offsetting amounts. The stated capital component will be reduced, and the additional paid-in capital component will be increased with the amount by which the stated capital is reduced. The per share net loss and net book value of our common stock will be increased because there will be fewer weighted average shares of common stock outstanding. Prior periods' common stock and additional paid-in capital balances and net loss per share amounts will be restated to reflect the reverse stock split.

Effect on Par Value

The proposed amendment to our Certificate of Incorporation will not affect the par value of our common stock, which will remain at \$0.01 per share.

No “Going Private Transaction”

Notwithstanding the anticipated decrease in the number of outstanding shares following the proposed reverse stock split, if effected, our Board of Directors does not intend for this transaction to be the first step in a “going private transaction” within the meaning of Rule 13e-3 under the Exchange Act.

Potential Anti-Takeover Effect

Although the increased proportion of unissued authorized shares to issued shares could, under certain circumstances, have an anti-takeover effect (for example, by permitting issuances that would dilute the stock ownership of a person seeking to effect a change in the composition of the Board of Directors or contemplating a tender offer or other transaction for the combination of the Company with another company), the reverse stock split proposal is not being proposed in response to any effort of which we are aware to accumulate shares of our common stock or obtain control of the Company, nor is it part of a plan by management to recommend a series of similar amendments to the Board of Directors and stockholders. Other than the reverse stock split proposal, the Board of Directors does not currently contemplate recommending the adoption of any other actions that could be construed to affect the ability of third parties to take over or change control of the Company.

No Dissenters' Rights

Under the Delaware General Corporation Law, our stockholders are not entitled to dissenters' rights with respect to the reverse stock split, and we will not independently provide stockholders with any such right.

Material United States Federal Income Tax Consequences of the Reverse Stock Split

The following is not intended as tax or legal advice. Each holder should seek advice based on his, her or its particular circumstances from an independent tax advisor.

The following discussion describes the anticipated material United States federal income tax consequences to “U.S. holders” (as defined below) of our capital stock relating to the reverse stock split. This discussion is based upon the Internal Revenue Code of 1986, as amended (the “Code”), Treasury Regulations promulgated thereunder, judicial authorities, published positions of the Internal Revenue Service (“IRS”), and other applicable authorities, all as currently in effect and all of which are subject to change or differing interpretations (possibly with retroactive effect). We have not obtained a ruling from the IRS or an opinion of legal or tax counsel with respect to the tax consequences of the reverse stock split and there can

be no assurance the IRS will not challenge the statements set forth below, or that a court would not sustain any such challenge. The following discussion is for information purposes only and is not intended as tax or legal advice.

For purposes of this discussion, the term “U.S. holder” means a beneficial owner of our capital stock that is for United States federal income tax purposes:

- (i) an individual citizen or resident of the United States;
- (ii) a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) organized under the laws of the United States, any state or the District of Columbia;
- (iii) an estate with income subject to United States federal income tax regardless of its source; or
- (iv) a trust that (a) is subject to primary supervision by a United States court and for which United States persons control all substantial decisions or (b) has a valid election in effect under applicable Treasury Regulations to be treated as a United States person.

This discussion assumes that a U.S. holder holds our capital stock as a capital asset within the meaning of Code Section 1221. This discussion does not address all of the tax consequences that may be relevant to a particular stockholder or to stockholders that are subject to special treatment under United States federal income tax laws including, but not limited to, financial institutions, tax-exempt organizations, insurance companies, regulated investment companies, persons that are broker-dealers, traders in securities who elect the mark-to-market method of accounting for their securities, or stockholders holding their shares of our capital stock as part of a “straddle,” “hedge,” “conversion transaction” or other integrated transaction. In addition, this discussion does not address other United States federal taxes (such as gift or estate taxes or alternative minimum taxes), the tax consequences of the reverse stock split under state, local or foreign tax laws or certain tax reporting requirements that may be applicable with respect to the reverse stock split.

If a partnership (or other entity treated as a partnership for United States federal income tax purposes) is a stockholder, the tax treatment of a partner in the partnership or any equity owner of such other entity will generally depend upon the status of the person and the activities of the partnership or other entity treated as a partnership for United States federal income tax purposes.

Tax Consequences of the Reverse Stock Split Generally

We believe that the reverse stock split should qualify as a “recapitalization” under Section 368(a)(1)(E) of the Code. Accordingly:

- A U.S. holder will not recognize any gain or loss as a result of the reverse stock split, except to the extent that cash is received in lieu of a fractional share.
- A U.S. holder’s aggregate tax basis in his, her or its post-reverse stock split shares will be equal to the aggregate tax basis in the pre-reverse stock split shares exchanged therefor, except to the extent that cash is received in lieu of a fractional share.
- A U.S. holder’s holding period for the post-reverse stock split shares will include the period during which such stockholder held the pre-reverse stock split shares surrendered in the reverse stock split.

Treasury Regulations promulgated under the Code provide detailed rules for allocating the tax basis and holding period of the shares of our common stock surrendered to the shares of our common stock received pursuant to the reverse stock split. Holders of shares of our common stock who acquired their shares on different dates and at different prices should consult their tax advisors regarding the allocation of the tax basis and holding period of such shares among their post-reverse stock split shares.

THE PRECEDING DISCUSSION IS INTENDED ONLY AS A SUMMARY OF CERTAIN FEDERAL INCOME TAX CONSEQUENCES OF THE REVERSE STOCK SPLIT AND DOES NOT PURPORT TO BE A COMPLETE ANALYSIS OR DISCUSSION OF ALL POTENTIAL TAX EFFECTS RELEVANT THERETO. YOU SHOULD CONSULT YOUR OWN TAX ADVISORS AS TO THE PARTICULAR FEDERAL, STATE, LOCAL, FOREIGN AND OTHER TAX CONSEQUENCES OF THE REVERSE STOCK SPLIT IN LIGHT OF YOUR SPECIFIC CIRCUMSTANCES.

Interests of Directors and Executive Officers

Our directors and executive officers have no substantial interests, directly or indirectly, in the matters set forth in this proposal except to the extent of their ownership of shares of our common stock.

Reservation of Right to Abandon Reverse Stock Split

We reserve the right to not file the Certificate of Amendment and to abandon any reverse stock split without further action by our stockholders at any time before the effectiveness of the filing with the Secretary of the State of Delaware of the Certificate of Amendment, even if the authority to effect these amendments is approved by our stockholders at the Special Meeting. By voting in favor of a reverse stock split, you are expressly also authorizing the Board of Directors to delay, not proceed with, and abandon, this proposed amendment if it should so decide, in its sole discretion, that such action is in the best interests of our stockholders.

Vote Required and Board of Directors' Recommendation

The affirmative vote of the majority of votes cast affirmatively or negatively on this proposal is required to approve the amendment to our Certificate of Incorporation to effect a reverse stock split of our common stock. Brokerage firms do have authority to vote customers' unvoted shares held by the firms in street name on this proposal. Abstentions and broker non-votes, if any, will have no effect on the results of this vote.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE TO AUTHORIZE THE BOARD OF DIRECTORS IN ITS DISCRETION TO AMEND THE AMENDED AND RESTATED CERTIFICATE OF INCORPORATION, AS AMENDED, TO EFFECT A REVERSE STOCK SPLIT OF THE ISSUED AND OUTSTANDING SHARES OF OUR COMMON STOCK (SUCH SPLIT TO COMBINE A NUMBER OF OUTSTANDING SHARES OF OUR COMMON STOCK BETWEEN FIVE (5) AND TWENTY-FIVE (25), SUCH NUMBER CONSISTING OF ONLY WHOLE SHARES, INTO ONE (1) SHARE OF OUR COMMON STOCK), AND PROXIES SOLICITED BY THE BOARD OF DIRECTORS WILL BE VOTED IN FAVOR OF THE AMENDMENT UNLESS A STOCKHOLDER INDICATES OTHERWISE ON THE PROXY.

PROPOSAL 2

ADJOURNMENT OF SPECIAL MEETING

(Notice Item 2)

If, at the Special Meeting, the number of votes in favor of Proposal 1 is insufficient to approve the amendment to our Certificate of Incorporation to effect the reverse stock split, our management may move to adjourn the Special Meeting in order to enable our Board of Directors to continue to solicit additional proxies in favor of Proposal 1.

In this proposal, we are asking our stockholders to authorize the holder of any proxy solicited by our Board of Directors to vote in favor of adjourning, postponing or continuing the Special Meeting and any later adjournments. If our stockholders approve the adjournment proposal, we could adjourn, postpone or continue the Special Meeting, and any adjourned session of the Special Meeting, to use the additional time to solicit additional proxies in favor of Proposal 1, including the solicitation of proxies from stockholders that have previously voted against the proposal. Among other things, approval of adjournment of the Special Meeting could mean that, even if proxies representing a sufficient number of votes against Proposal 1 have been received, we could adjourn, postpone or continue the Special Meeting without a vote on Proposal 1 and seek to convince the holders of those shares to change their votes to votes in favor of approval of Proposal 1.

Vote Required and Board of Directors' Recommendation

The affirmative vote of a majority of votes cast affirmatively or negatively on this proposal is required to approve the adjournment of the Special Meeting to a later date or dates, if necessary or appropriate, to solicit additional proxies if there are insufficient votes to approve Proposal 1. Brokerage firms do have authority to vote customers' unvoted shares held by the firms in street name on this proposal. Abstentions and broker non-votes, if any, will have no effect on the results of this vote.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE TO APPROVE THE ADJOURNMENT OF THE SPECIAL MEETING TO A LATER DATE OR DATES, IF NECESSARY OR APPROPRIATE, TO SOLICIT ADDITIONAL PROXIES IF THERE ARE INSUFFICIENT VOTES TO ADOPT PROPOSAL 1, AND PROXIES SOLICITED BY THE BOARD WILL BE VOTED IN FAVOR OF SUCH APPROVAL UNLESS A STOCKHOLDER INDICATES OTHERWISE ON THE PROXY.

OTHER MATTERS

The Board of Directors knows of no other matters to be brought before the Special Meeting. If any other matters are properly brought before the Special Meeting, the persons appointed in the accompanying proxy intend to vote the shares represented thereby in accordance with their best judgment on such matters, under applicable laws.

STOCKHOLDER COMMUNICATIONS

The Board provides every stockholder the ability to communicate with the Board, as a whole, and with individual directors on the Board through an established process for stockholder communication (as that term is defined by the rules of the SEC). Stockholders may send such communication to the attention of the Chairman of the Board or to the attention of the individual director by U.S. Mail (including courier or expedited delivery service) to Yield10 Bioscience, Inc., 19 Presidential Way, Woburn, MA 01801. The Company will forward any such stockholder communication to the Chairman of the Board, as a representative of the Board, and/or to the director to whom the communication is addressed.

Woburn, Massachusetts

April 2, 2024

APPENDIX A
FORM OF PROXY CARD

Proxy Card:

SPECIAL MEETING OF STOCKHOLDERS OF

YIELD10 BIOSCIENCE, INC.

April 26, 2024

Important Notice Regarding Internet Availability of Proxy Materials for the Special Meeting: The proxy statement is available at <https://ir.yield10bio.com/investor-relations>.

Please sign, date and mail your proxy card in the envelope provided as soon as possible.

Please detach along perforated line and mail in the envelope provided.

THE BOARD OF DIRECTORS RECOMMENDS A VOTE FOR PROPOSAL 1 AND PROPOSAL 2. PLEASE SIGN, DATE AND RETURN PROMPTLY IN THE ENCLOSED ENVELOPE. PLEASE MARK YOUR VOTE IN BLUE OR BLACK INK AS SHOWN HERE ☒

1. Proposal to amend the Company's Amended and Restated Certificate of Incorporation, as amended, to effect a reverse stock split of our issued and outstanding shares of common stock, at a ratio of between 1-for-5 and 1-for-25.

This Proxy, when executed, will be voted in the manner directed herein. If you do not specify below how you want your shares to be voted, this Proxy will be voted FOR the Proposal.

☐ FOR ☐ AGAINST ☐ ABSTAIN

VOTE BY MAIL

2. Proposal to approve adjournment of the Special Meeting, if necessary, if a quorum is present, to solicit additional proxies if there are not sufficient votes in favor of Proposal 1.

Mark, sign, and date your proxy card. Return it in the prepaid postage envelope we have provided, or return it to Yield10 Bioscience, Inc., c/o Broadridge, 51 Mercedes Way, Edgewood, NY 11717.

☐ FOR ☐ AGAINST ☐ ABSTAIN

To change the address on your account, please check the box at right and indicate your new address in the address space above. Please note that changes to the registered name(s) on the account may not be submitted via this method. ☐

Signature of Stockholder

Date:

Signature of Stockholder

Date:

Note: Please sign exactly as your name appear on this Proxy. When shares are hold jointly, each holder should sign. When signer is a partnership, please sign in partnership name by authorized person.

APPENDIX B

FORM OF CERTIFICATE OF AMENDMENT TO EFFECT REVERSE STOCK SPLIT

FORM OF CERTIFICATE OF AMENDMENT TO EFFECT REVERSE STOCK SPLIT

Pursuant to Section 242 of the General Corporation Law of the State of Delaware, Yield10 Bioscience, Inc., a corporation organized and existing under the laws of the State of Delaware (the "Corporation"), does hereby certify as follows:

1. The name of the Corporation is Yield10 Bioscience, Inc.

2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 1, 1998. An Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on November 15, 2006, and thereafter, Certificates of Amendment were filed on October 30, 2014, May 26, 2015, January 6, 2017, May 25, 2017, December 27, 2017, May 23, 2018 and January 15, 2020 with the Secretary of State of the State of Delaware.

3. The Corporation's Amended and Restated Certificate of Incorporation, as amended, is hereby further amended by striking out the second paragraph of Article IV and replacing it with the following paragraph:

[“Upon effectiveness of this Certificate of Amendment (the “Effective Time”), the shares of Common Stock issued and outstanding immediately prior to the Effective Time and the shares of Common Stock issued and held in the treasury of the Corporation immediately prior to the Effective Time are reclassified into a smaller number of shares such that each [] shares of issued Common Stock immediately prior to the Effective Time is reclassified into one (1) share of Common Stock. Notwithstanding the immediately preceding sentence, no fractional shares shall be issued as a result of the reverse stock split. Instead, any stockholder who would otherwise be entitled to a fractional share of our Common Stock as a result of the reclassification shall be entitled to receive a cash payment equal to the product of such resulting fractional interest in one share of our Common Stock multiplied by the closing trading price of our Common Stock on the trading day immediately preceding the effective date of the reverse stock split. Notwithstanding the foregoing, the Corporation shall not be obliged to issue certificates evidencing the shares of Common Stock outstanding as a result of the reverse stock split or cash in lieu of fractional shares, if any, unless and until the certificates evidencing the shares held by a holder prior to the reverse stock split are either delivered to the Corporation or its transfer agent, or the holder notifies the Corporation or its transfer agent that such certificates have been lost, stolen or destroyed and executes an agreement satisfactory to the Corporation to indemnify the Corporation from any loss incurred by it in connection with such certificates.”]

4. The Amendment of the Amended and Restated Certificate of Incorporation, as amended, herein certified has been duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware.

5. This Certificate of Amendment shall be effective on [] at [], Eastern Time.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to be signed by its duly authorized officer on this [] day of [].

YIELD10 BIOSCIENCE, INC.

By: _____

Name: Oliver P. Peoples

Title: President and Chief Executive Officer
