

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

FORM S-1

**REGISTRATION STATEMENT
under the
SECURITIES ACT OF 1933**

YIELD10 BIOSCIENCE, INC.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	2870	04-3158289
(State or other jurisdiction of incorporation or organization)	(Primary Standard Industrial Classification Code Number)	(IRS Employer Identification No.)

**19 Presidential Way
Woburn, Massachusetts 01801
(617) 583-1700**
(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Dr. Oliver P. Peoples
President & Chief Executive Officer
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Approximate date of commencement of proposed sale to the public:
As soon as practicable after the effective date of this registration statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant files a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

SUBJECT TO COMPLETION, DATED JULY 13, 2023

PRELIMINARY PROSPECTUS



YIELD10 BIOSCIENCE, INC.

Shares of Common Stock

Pre-funded Warrants to Purchase up to Shares of Common Stock
Shares of Common Stock Underlying Pre-funded Warrants

We are offering _____ shares of our common stock and to each purchaser whose purchase of shares of common stock in this offering would otherwise result in the purchaser, together with its affiliates and certain related parties, beneficially owning more than 4.99% of our outstanding common stock immediately following the consummation of this offering, the opportunity to purchase, if the purchaser so chooses, a pre-funded warrant, in lieu of shares of common stock. Each pre-funded warrant will be exercisable for one share of our common stock. The purchase price of each pre-funded warrant will equal the price per share at which the shares of common stock are being sold to the public in this offering, minus \$0.001, and the exercise price of each pre-funded warrant will be \$0.001 per share. This prospectus also relates to the shares of common stock issuable upon exercise of any pre-funded warrants sold in this offering. For each pre-funded warrant we sell, the number of shares of common stock we are offering will be decreased on a one-for-one basis.

Our common stock is listed on The Nasdaq Capital Market under the symbol "YTEN." The last reported sale price for our common stock on The Nasdaq Capital Market on July _____, 2023 was \$ _____ per share. The actual number of securities, and the offering price per share and pre-funded warrant will be as determined between us and the underwriters at the time of pricing, and may be at a discount to the current market price. Therefore, the recent market price used throughout this prospectus may not be indicative of the actual public offering price for our common stock and for the pre-funded warrants. There is no established public trading market for the pre-funded warrants and we do not expect a market to develop. In addition, we do not intend to apply for a listing of the pre-funded warrants on any national securities exchange.

Investing in our common stock involves a high degree of risk. See "Risk Factors" beginning on page 6 of this prospectus.

	Per Share	Per Pre-Funded Warrant	Total ⁽¹⁾
Public offering price ⁽²⁾	\$	\$	\$
Underwriting discounts and commissions ⁽³⁾	\$	\$	\$
Proceeds, before expenses, to us	\$	\$	\$

(1) Assumes no sale of pre-funded warrants.

(2) The public offering price is \$ _____ per share of common stock and \$ _____ per pre-funded warrant.

We have also granted an option to the underwriters to purchase up to _____ additional shares of common stock on the same terms and conditions set forth above from us within 45 days after the date of this prospectus to cover over-allotments, if any.

(3) See the section entitled "Underwriting" beginning on page 22 of this prospectus for a description of the compensation payable to the underwriters.

Neither the Securities and Exchange Commission (the "SEC") nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The underwriters expect to deliver the shares of common stock and any pre-funded warrants to purchasers on or about _____, 2023.

The date of this prospectus is _____, 2023

Sole Book-Running Manager

Maxim Group LLC

THE INFORMATION IN THIS PROSPECTUS IS NOT COMPLETE AND MAY BE CHANGED. THIS PROSPECTUS IS NOT AN OFFER TO SELL THESE SECURITIES AND IS NOT SOLICITING AN OFFER TO BUY THESE SECURITIES IN ANY STATE WHERE THE OFFER OR SALE IS NOT PERMITTED.

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You should read this prospectus, any applicable prospectus supplement and any documents incorporated by reference into this prospectus before making an investment in the securities of Yield10 Bioscience, Inc. See “Where You Can Find More Information” for more information. We and the underwriters take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. Neither we nor any of the underwriters have authorized anyone to provide you with different information. This document may be used only in jurisdictions where offers and sales of these securities are permitted. The information contained in this prospectus, or in any prospectus supplement, is accurate only as of its date. Our business, financial condition, results of operations and prospects may have changed since such date. Unless otherwise noted in this prospectus, “Yield10 Bioscience,” “Yield10,” “the Company,” “we,” “us,” “our” and similar terms refer to Yield10 Bioscience, Inc.

Smaller Reporting Company — Scaled Disclosure

Pursuant to Item 10(f) of Regulation S-K promulgated under the Securities Act of 1933, as amended (the “Securities Act”), as indicated herein, we have elected to comply with the scaled disclosure requirements applicable to “smaller reporting companies,” including providing two years of audited financial statements.

PROSPECTUS SUMMARY

This summary highlights some information from this prospectus. It may not contain all the information important to making an investment decision. You should read the following summary together with the more detailed information regarding our Company and the securities being sold in this offering, including “Risk Factors” and other information incorporated by reference herein.

Business Overview

Yield10 Bioscience, Inc. (“Yield10” or the “Company”) is an agricultural bioscience company focused on the large-scale production of low carbon sustainable products from processing Camelina seed using the oilseed Camelina sativa (“Camelina”) as a platform crop. These seed products include:

- Camelina oil for use as a low carbon biofuel feedstock
- Omega-3 oils for nutrition
- PHA Bioplastics for biodegradable zero waste packaging solutions

The co-product from producing these seed products is Camelina meal which has a protein content of over 40% and is currently approved for use in a range of animal feed rations.

Our commercial plan is based on developing and releasing a series of proprietary elite Camelina seed varieties incorporating genetic traits from our development pipeline which are being designed to offer improved on-farm performance that we anticipate will lead to increased acreage adoption and seed product revenue. Yield10 is headquartered in Woburn, Massachusetts and has a Canadian subsidiary, Yield10 Oilseeds Inc., located in Saskatoon, Saskatchewan, Canada.

Camelina, an annual oilseed plant in the mustard family, was selected as our platform crop based on its unique attributes, including its excellent agronomic traits such as low water and fertilizer input, drought resistance and short life cycle, making it suitable as a rotation crop within the U.S. Northwest and regions of Canada, as well as a relay or cover crop with corn and soybean in the U.S. Midwest. We estimate there is the potential for over 30 million acres of Camelina production in North America. Camelina is in the same plant family as canola and naturally produces a relatively abundant harvest of oil-containing protein-rich seeds. Camelina is highly amenable to advanced genetic engineering and genome-editing technologies. Over the last twelve years, we have been developing improved Camelina seed varieties through identification and deployment of our gene trait discoveries followed by performance evaluation in field tests. Our new seed product traits include the PHA bioplastic trait developed by us and the omega-3 (EPA, DHA+EPA) oil traits on which we secured exclusive rights to a commercial license option in 2020.

Our capital light business model is based on contracting with growers to produce Camelina grain using our proprietary Camelina seed. Yield10 will have the exclusive right to purchase the harvested grain from these growers for downstream processing to separate and sell the seed products into the different markets. Our commercial launch plan is to leverage the growing global demand for biofuels to decarbonize the transportation sector, and in particular, the renewable diesel (“RD”) and sustainable aviation fuel (“SAF”) markets. We recognized early on that we could play an important role in the biofuel value chain through the use of our advanced Camelina platform to address a key industry bottleneck; the significant shortfall in the supply of low carbon intensity feedstock oil. The establishment of downstream value chain partnerships represents a critical step towards enabling Yield10 to scale this business. We expect to build the operating foundation of our products business by securing offtake agreements with downstream oilseed processing/ biofuel partners. Sources of revenue from our first Camelina seed product will be based on the financial terms negotiated with these biofuel offtake partners. Here our goal is to link the base oil price for other commodity seed oils, such as soybean, and share in the economic value of the lower carbon intensity score of the Camelina oil. We expect that initial revenue growth from this business will scale up based on increasing the number of acres of our Camelina planted during each growing season. Feedback from our grower outreach has identified weed control and soil residues from the herbicides used on prior crop as key limitations to the adoption of existing Camelina varieties. To achieve our revenue targets, improved Camelina varieties with new genetic traits are being accelerated through our development pipeline in order to offer farmers weed control and a seamless integration into their current crop rotations. We expect to be able to substantially

increase revenue for our growers by introducing proprietary performance traits from the Yield10 pipeline, including higher seed oil content and seed yield traits that can increase the per acre harvest value of the Camelina grain. Improved grower income is expected to lead to increasing numbers of growers under contract, increased acres planted and higher product revenue and income for the Company.

Advancements in Camelina varieties, seed operations capabilities, grower network and supply chain developed for biofuels and underwritten by biofuel partnerships will position Yield10 for the subsequent launch of its second Camelina seed product omega-3 oils and in the future, PHA bioplastics.

As a first stage in our initial Camelina commercialization, during the third quarter of 2022, we engaged growers in contracts for the production of Camelina grain and Camelina seed having a total acreage of approximately 1,000 acres. These growers are located in the U.S. and Canada with each grower planting between 30 and 160 acres of our WDH2 (winter, cold tolerant) and WDH3 (winter, early maturing) seed varieties, with harvest expected to occur in the summer of 2023. We intend to use the seed harvest for toll crushing and further seed production that will provide us with seed inventory for future grower contracts during 2023 and beyond. Also, during 2022, we contracted with other growers to plant our E3902 (spring, high oil yield), WDH2 (winter, increased cold tolerance) and WDH3 (winter, early flowering) Camelina plant varieties to produce commercial planting seed. This activity is an essential part of our business model to produce commercial seed inventory for future grower contracts. We expect future grower contracts to cover Camelina grain production for large-scale grain processing to supply low-carbon intensity feedstock oil for the biofuel market and high-protein meal for the animal feed market.

We are currently pursuing the development of elite Camelina germplasm exhibiting herbicide tolerance, disease resistance and other traits that we believe in the near future, will form improved elite Camelina varieties for the biofuel market and will later be combined with the new seed product traits in development to expand our markets. We ultimately expect to have three types of elite Camelina seed varieties in contracted production to address our product markets.

We believe the market opportunity for biofuel feedstocks from our elite Camelina varieties, as well as our other proprietary seed products in development, including performance traits for use in other crops, is significant. We are targeting uses for our Camelina seed products in commercial applications such as: low-carbon feedstock oils for renewable diesel and sustainable aviation fuel, omega-3 oils for aquaculture and nutrition, and PHA bioplastics. In July 2022, we signed a nonbinding memorandum of understanding (“MOU”) with Mitsubishi Corporation to evaluate the establishment of a partnership to supply, offtake and market Camelina as a low-carbon feedstock oil for biofuel, and in February 2023, we signed another nonbinding MOU with American Airlines to collaborate in the development of the value chain for Camelina as a low-carbon feedstock oil for sustainable aviation fuel. On April 27, 2023, the Company signed a non-binding letter of intent (“LOI”) with Marathon Petroleum Corporation (“Marathon”) for a potential investment in Yield10 by Marathon and an offtake agreement for low-carbon intensity Camelina feedstock oil for use in renewable fuels. In connection with signing the LOI, Yield10 sold and issued to MPC Investment LLC, an affiliate of Marathon (the “Purchaser”), a senior unsecured convertible note in the original principal amount of \$1.0 million which is convertible into shares of the Company’s common stock at a conversion price equal to \$3.07 per share. We believe performance traits from our gene discovery and development platform (the “Trait Factory”) and value-added product strategy will provide strong differentiation for Yield10’s elite Camelina seed varieties, making them preferred by growers to address large product market opportunities as illustrated below. These traits will also be made available to leading seed companies for use in other crops to create licensing revenue.

Platform	Product	Main Markets	Revenue Potential	Status
Elite Camelina	Feedstock oil	<ul style="list-style-type: none"> ▪ Renewable diesel ▪ Aviation biofuel \$27 billion	\$180 million - \$1 billion	<ul style="list-style-type: none"> ▪ Early Commercial ▪ Accelerating elite variety development ▪ Focus: US, Canada ▪ Biofuel partner outreach
Elite PHA Camelina	PHA Bioplastics Feedstock oil	<ul style="list-style-type: none"> ▪ Single use plastic \$200 billion	\$3.6 billion	<ul style="list-style-type: none"> ▪ Trait optimization ▪ Pilot process development ▪ Partner outreach
Elite Omega-3 Camelina	Omega-3 Oil (DHA+EPA)	<ul style="list-style-type: none"> ▪ Aquaculture feed ▪ Nutrition \$4-6 billion	\$0.5 billion	<ul style="list-style-type: none"> ▪ Pre-commercial development ▪ Partner outreach

(1) Internal Company estimates of 2030 product revenue potential.

Our Camelina platform and each of our seed product targets are well-aligned with global trends in reducing carbon emissions and improving sustainability, including the need for:

- Producing low-carbon intensity biofuel feedstock oil for renewable diesel and aviation biofuel.
- Increasing the production of cover crops to reduce the climate change impact from agriculture.
- Producing PHA bioplastics to enable single use food service items and packaging with zero waste.
- Increasing global food security by:
 - producing land-based omega-3 (EPA, DHA+EPA) fatty acid oils for use in aquaculture and nutraceuticals;
 - increasing high quality protein production from Camelina seed; and
 - developing performance traits to increase yield and/or seed oil per acre for major food crops.

We have a pipeline of more than 10 novel yield and/or seed oil content performance traits currently in research and development. Today, we also have research agreements in place for a number of our yield trait gene candidates, including agreements with GDM Seeds (“GDM”) and JR Simplot Company (“Simplot”). These companies are currently making progress on the development of our traits in soybean and potato. Our plan is to support these licensees as they work to generate proof points using our traits in their crops of interest.

We also plan to find partners for our traits in canola, corn and other crops as we generate additional data and new trait leads using our Trait Factory.

We are building an intellectual property portfolio around our crop technologies and traits. As of March 31, 2023, we own or hold exclusive rights to 19 patent families, including 15 issued patents and 41 pending patent applications, related to advanced technologies for increasing crop performance and composition traits in oils and PHA bioplastics, in the United States and throughout the world. As part of our agreement with Rothamsted Research Limited (“Rothamsted”), we have an exclusive option to license two patent families, including six issued patents and four pending applications, including both the original patent filing for the production of EPA, DHA+EPA oil in Camelina and for an improvement patent filed after the agreement was signed. In November 2022, Yield10 and Rothamsted agreed to extend the exclusive option and license agreement until December 31, 2023.

Corporate Information

We were incorporated in Massachusetts in 1992 under the name Metabolix, Inc. In September 1998, we reincorporated in Delaware. We changed our name to Yield10 Bioscience, Inc. in January 2017 to reflect our change in mission around innovations in agricultural biotechnology focused on developing disruptive technologies for step-change improvements in crop yield and niche crop products. Our corporate headquarters are located at 19 Presidential Way, Woburn, MA 01801, and our telephone number is +1 (617) 583-1700. Our website address is www.yield10bio.com. The information contained on our website or that can be accessed through our website is not part of this prospectus and is included as an inactive textual reference only.

THE OFFERING

Common stock offered by us

_____ shares (_____ shares if the underwriters exercise their over-allotment option in full), assuming the sale of our shares of common stock at an assumed public offering price of \$ _____ per share, which is the last reported sale price of our common stock on Nasdaq on July _____, 2023, and no sale of any pre-funded warrants.

Pre-funded warrants offered by us

We are also offering to each purchaser whose purchase of shares of common stock in this offering would otherwise result in the purchaser, together with its affiliates and certain related parties, beneficially owning more than 4.99% of our outstanding common stock immediately following the consummation of this offering, the opportunity to purchase, if the purchaser so chooses, a pre-funded warrant, in lieu of shares of common stock. Each pre-funded warrant will be exercisable for one share of our common stock. The purchase price of each pre-funded warrant will equal the price per share at which the shares of common stock are being sold to the public in this offering, minus \$0.001, and the exercise price of each pre-funded warrant will be \$0.001 per share. This offering also relates to the shares of common stock issuable upon exercise of any pre-funded warrants sold in this offering. For each pre-funded warrant we sell, the number of shares of common stock we are offering will be decreased on a one-for-one basis.

Option to purchase additional securities

The underwriter has a 45-day option to purchase up to an additional _____ shares of common stock from us at the public offering price, less underwriting discounts and commissions.

Common stock to be outstanding after this offering

_____ shares (assuming the sale of \$ _____ of our shares of common stock at an assumed public offering price of \$ _____ per share, which is the last reported sale price of our common stock on Nasdaq on July _____, 2023, no sale of pre-funded warrants and no exercise of the underwriters' over-allotment option).

Use of proceeds

We estimate the net proceeds to us from this offering, after deducting underwriting discounts and commissions and estimated offering expenses payable by us, will be approximately \$ _____ million, assuming a public offering price of \$ _____ per share, which is the last reported sale price of our common stock on Nasdaq on July _____, 2023 and no sale of pre-funded warrants. The actual offering price for the offered securities will be as determined between us and the underwriters at the time of pricing, and may be at a discount to the current market price. We intend to use the net proceeds from this offering for general corporate purposes. See the section entitled "*Use of Proceeds*" beginning on page 9 of this prospectus.

Risk factors

An investment in our securities involves a high degree of risk. See the section entitled "*Risk Factors*" beginning on page 6 of this prospectus and the similarly entitled sections in the documents incorporated by reference into this prospectus.

Nasdaq Capital Market symbol

Our common stock is listed on the Nasdaq Capital Market under the symbol "YTEN." We do not intend to list the pre-funded warrants on any securities exchange or nationally recognized trading system.

Outstanding Shares

The number of shares of common stock that will be outstanding after this offering is based on 6,100,263 shares outstanding as of June 30, 2023, and excludes:

- 1,157,351 shares of common stock issuable upon exercise of options to purchase our common stock outstanding as of June 30, 2023 at a weighted average exercise price of \$12.02 per share;

- 14,270 shares of common stock issuable upon exercise of warrants outstanding as of June 30, 2023 at an exercise price of \$201.60 per share;
- 1,114,278 shares of common stock issuable upon exercise of Series B Warrants at an exercise price of \$8.00 per share;
- 1,006,710 shares of common stock issuable upon exercise of warrants issued to investors outstanding as of June 30, 2023 (which warrants become exercisable on November 6, 2023 at an exercise price of \$2.98 per warrant and expire on November 6, 2028); and
- 750 shares of common stock issuable upon exercise of vested warrants outstanding as of June 30, 2023 at an exercise price of \$116.00 per share.

RISK FACTORS

An investment in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully the risks and uncertainties described below and in the section captioned "Risk Factors" contained in our [Annual Report on Form 10-K for the fiscal year ended December 31, 2022 filed with the SEC on March 14, 2023](#) and other filings we make with the SEC from time to time, which are incorporated by reference herein in their entirety, together with other information in this prospectus and the information incorporated by reference herein. If any of these risks actually occurs, our business, financial condition, results of operations or cash flow could suffer materially. In such event, the trading price of our common stock could decline, and you might lose all or part of your investment.

There can be no assurance that we will be able to comply with the continued listing standards of the Nasdaq Capital Market.

We cannot assure you that we will be able to comply with the standards that we are required to meet in order to maintain a listing of our common stock on the Nasdaq Capital Market. Listing rules of the Nasdaq Stock Market LLC ("Nasdaq") require us to maintain certain closing bid price, stockholders' equity and other financial metric criteria in order for our common stock to continue trading on the Nasdaq Capital Market. For example, Nasdaq Listing Rule 5550(a)(4) requires companies to maintain a minimum of 500,000 publicly held shares, Nasdaq Listing Rule 5550(a)(2) requires listed securities to maintain a minimum bid price of \$1.00 per security, and Listing Rule 5810(c)(3)(A) provides that a failure to meet the minimum bid price requirement exists if the deficiency continues for a period of 30 consecutive business days.

On May 18, 2023, we received a deficiency letter (the "Letter") from the Listing Qualifications Department (the "Staff") of Nasdaq notifying the Company that it is not in compliance with the minimum stockholders' equity requirement for continued listing on Nasdaq. Nasdaq Listing Rule 5550(b)(1) requires companies listed on the Nasdaq Capital Market to maintain stockholders' equity of at least \$2,500,000 (the "Stockholders' Equity Requirement"). The Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2023, filed with the SEC on May 12, 2023, reported stockholders' equity of \$1,143,000, which is below the Stockholders' Equity Requirement. As of June 1, 2023, the Company does not have a market value of listed securities of \$35 million, or net income from continued operations of \$500,000 in the most recently completed fiscal year or in two of the last three most recently completed fiscal years, the alternative quantitative standards for continued listing on the Nasdaq Capital Market. The Letter has no immediate effect on the Company's continued listing on Nasdaq, subject to the Company's compliance with the other continued listing requirements. In accordance with Nasdaq rules, the Company has submitted a plan to regain compliance with this listing requirement (the "Compliance Plan"). If the Compliance Plan is acceptable to the Staff, the Staff may grant an extension of 180 calendar days from the date of the Staff notification to regain compliance with the Stockholders' Equity Requirement. If the Staff does not accept the Compliance Plan, the Staff will provide written notification to the Company that the Compliance Plan has been rejected. At that time, the Company may appeal the Staff's determination to a Nasdaq Hearings Panel. The Company intends to monitor its stockholders' equity and, if appropriate, consider further available options to regain compliance with the Stockholders' Equity Requirement. There can be no assurance that the Company will be able to regain compliance with the Stockholders' Equity Requirement.

Management will have broad discretion as to the use of the proceeds from this offering and we may not use the proceeds effectively.

Our management will have broad discretion with respect to the use of proceeds of this offering, including for any of the purposes described in the section entitled "*Use of Proceeds*" beginning on page 9 of this prospectus. You will be relying on the judgment of our management regarding the application of the proceeds of this offering. The results and effectiveness of the use of proceeds are uncertain, and we could spend the proceeds in ways that you do not agree with or that do not improve our results of operations or enhance the value of our common stock. Our failure to apply these funds effectively could harm our business and cause the price of our common stock to decline.

You will experience immediate and substantial dilution as a result of this offering and may experience additional dilution in the future.

You will incur immediate and substantial dilution as a result of this offering. After giving effect to the sale by us of securities offered in this offering at an assumed public offering price of \$ _____ per share of

common stock, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us, investors in this offering can expect an immediate dilution of approximately \$ _____ per share. See the section entitled “*Dilution*” beginning on page 13 of this prospectus for a more detailed discussion of the dilution you will incur if you purchase shares in this offering. The discussion above assumes no sale of pre-funded warrants, which, if sold, would reduce the number of shares of common stock that we are offering on a one-for-one basis.

There is no public market for the pre-funded warrants being offered in this offering.

There is no established public trading market for the pre-funded warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list the pre-funded warrants on any securities exchange or nationally recognized trading system, including The Nasdaq Capital Market. Without an active market, the liquidity of the pre-funded warrants will be limited.

Holders of pre-funded warrants purchased in this offering will have no rights as common stockholders until such holders exercise their warrants and acquire our common stock.

Until holders of pre-funded warrants acquire shares of our common stock upon exercise thereof, holders of warrants will have no rights with respect to the shares of our common stock underlying such warrants. Upon exercise of the pre-funded warrants, the holders will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the information incorporated by reference in this prospectus contain forward-looking statements within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934 (“Exchange Act”), regarding our strategy, future, operations, future financial position, future revenues, projected costs, and plans and objectives of management. You can identify these forward-looking statements by their use of words such as “anticipate,” “believe,” “estimate,” “expect,” “intend,” “may,” “plan,” “project,” “target,” “potential,” “will,” “would,” “could,” “should,” “continue,” and similar expressions. You also can identify them by the fact that they do not relate strictly to historical or current facts. There are a number of important risks and uncertainties that could cause our actual results to differ materially from those indicated by forward-looking statements. For a description of these risks and uncertainties, please refer to the section entitled “*Risk Factors*,” any other risk factors set forth in any information incorporated by reference in this prospectus, as well as any other risk factors and cautionary statements we include or incorporate by reference into this prospectus in the future. While we may elect to update forward-looking statements wherever they appear in this prospectus or in the documents incorporated by reference in this prospectus, we do not assume, and specifically disclaim, any obligation to do so, whether as a result of new information, future events or otherwise.

USE OF PROCEEDS

We estimate that the net proceeds from our issuance and sale of our common stock and pre-funded warrants in this offering will be approximately \$ million, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us and assuming a public offering price of \$ per share, which is the last reported sale price of our common stock on Nasdaq on July , 2023, and no sale of pre-funded warrants.

As of March 31, 2023, we had cash and cash equivalents of approximately \$1.8 million. As of June 30, 2023, we had cash and cash equivalents of approximately \$2.3 million. Cash and cash equivalents as of June 30, 2023 is preliminary, unaudited and subject to completion and may differ from what will be reflected in our unaudited interim financial statements as of and for the three and six months ended June 30, 2023. Our unaudited interim condensed financial statements as of and for the three and six months ended June 30, 2023 will not be available to you prior to investing in the securities offered by this prospectus.

We intend to use the net proceeds from this offering for general corporate purposes.

This expected use of net proceeds from this offering and our existing cash and cash equivalents represents our intentions based upon our current plans and business conditions, which could change in the future as our plans and business conditions evolve. The amounts and timing of our actual expenditures may vary significantly depending on numerous factors, including the progress of our development, any collaborations that we may enter with third parties, and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering. We have no current agreements, commitments or understandings for any material acquisitions or licenses of any products, businesses or technologies.

We anticipate existing cash and cash equivalents and the net proceeds from this offering will be sufficient to fund our planned operations through . We plan to raise additional capital in the future to fund our ongoing working capital requirements.

As of the date of this prospectus, we cannot predict with certainty all the uses for the net proceeds to be received upon the completion of this offering or the amounts we will spend on the uses set forth above. Pending our use of the net proceeds from this offering, we intend to invest a portion of the net proceeds in a variety of capital preservation investments, including short-term, interest-bearing instruments and U.S. government securities.

MARKET FOR OUR COMMON STOCK

Market Information

Our common stock is listed under the symbol “YTEN” on the Nasdaq Capital Market.

Stockholders

As of July 12, 2023, there were approximately 28 stockholders of record.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock and do not expect to pay any cash dividends for the foreseeable future. We intend to use future earnings, if any, in the operation and expansion of our business. Any future determination relating to our dividend policy will be made at the discretion of our board of directors, based on our financial condition, results of operations, contractual restrictions, capital requirements, business properties, restrictions imposed by applicable law and other factors our board of directors may deem relevant.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and capitalization as of March 31, 2023:

- on an actual basis as of March 31, 2023;
- on a pro forma basis to give effect to the issuance and sale of 931,600 shares of our common stock, a pre-funded warrant to purchase 75,110 shares of our common stock, and private placement warrants to purchase 1,006,710 shares of our common stock and our receipt of net proceeds of \$2.7 million therefrom, in a private placement consummated on May 3, 2023; and
- on a pro forma as adjusted basis to give further effect to the issuance and sale of shares of our common stock in this offering at an assumed public offering price of \$ _____ per share, which is the last reported sale price for our common stock on Nasdaq on July _____, 2023, after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, and assuming no pre-funded warrants are issued.

Our capitalization following the closing of this offering will be adjusted based on the actual public offering price and other terms of this offering determined at pricing. You should read this table together with our consolidated financial statements and the related notes and the sections entitled “*Management’s Discussion and Analysis of Financial Condition and Results of Operations*” in our [Annual Report on Form 10-K for the year ended December 31, 2022](#) and [our Quarterly Report on Form 10-Q for the quarter ended March 31, 2023](#), both of which are incorporated by reference herein.

	Actual	Pro Forma	Pro Forma As Adjusted ⁽¹⁾
	(in thousands)		
Cash and cash equivalents	\$ 1,809	\$ 4,532	\$ _____
Stockholders’ equity:			
Common stock, \$0.01 par value per share: 60,000,000 shares authorized as of March 31, 2023; 5,078,557 shares issued and outstanding as of March 31, 2023; 6,085,267 shares issued and outstanding pro forma	51	61	
Additional paid-in capital	404,803	407,516	
Accumulated deficit	(403,479)	(403,479)	
Accumulated other comprehensive loss	(232)	(232)	
Total stockholders’ equity	1,143	3,866	
Total capitalization	\$ 1,143	\$ 3,866	\$ _____

- (1) Each \$0.10 increase (decrease) in the assumed public offering price per share would increase (decrease) the amount of cash and cash equivalents, working capital, total assets, and total stockholders’ equity by approximately \$ _____ million, assuming the number of securities offered by us, as set forth on the cover page of this prospectus, remains the same, no pre-funded warrants are issued, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us. We may also increase or decrease the number of securities to be issued in this offering. Each increase (decrease) of 1.0 million shares offered by us would increase (decrease) the as adjusted amount of cash and cash equivalents, working capital, total assets and total stockholders’ equity by approximately \$ _____ million, assuming the assumed public offering price remains the same, no pre-funded warrants are issued, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us. The as adjusted information discussed above is illustrative only and will be adjusted based on the actual public offering price and other terms of this offering determined between us and the underwriters at pricing.

Except as otherwise indicated herein, the number of shares of our common stock to be outstanding after this offering is based on 6,100,263 shares outstanding as of June 30, 2023, and excludes:

- 1,157,351 shares of common stock issuable upon exercise of options to purchase our common stock outstanding as of June 30, 2023 at a weighted average exercise price of \$12.02 per share;
- 14,270 shares of common stock issuable upon exercise of warrants outstanding as of June 30, 2023 at an exercise price of \$201.60 per share;
- 1,114,278 shares of common stock issuable upon exercise of Series B Warrants outstanding as of June 30, 2023 at an exercise price of \$8.00 per share;
- 1,006,710 shares of common stock issuable upon exercise of warrants outstanding as of June 30, 2023 (which warrants become exercisable on November 6, 2023 at an exercise price of \$2.98 per warrant and expire on November 6, 2028); and
- 750 shares of common stock issuable upon exercise of immediately vested warrants outstanding as of June 30, 2023 at an exercise price of \$116.00 per share.

DILUTION

If you invest in our securities in this offering, your ownership interest will be diluted immediately to the extent of the difference between the public offering price per share of our common stock (or pre-funded warrant) and the as adjusted net tangible book value per share of our common stock after this offering.

Our historical net tangible book value as of March 31, 2023 was \$1.1 million, or \$0.23 per share of our common stock. Historical net tangible book value per share represents the amount of our total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding as of March 31, 2023.

Our pro forma net tangible book value as of March 31, 2023 was \$3.9 million, or \$0.64 per share of our common stock. Pro forma net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding as of March 31, 2023, after giving effect to the issuances of 931,600 shares of common stock and a pre-funded warrant to purchase 75,110 shares of common stock (and assuming the exercise thereof, and no exercise of the other warrants sold in such private placement) and the receipt of net proceeds of \$2.7 million therefrom, in a private placement on May 3, 2023.

After giving further effect to the issuance and sale of _____ shares of our common stock in this offering at an assumed public offering price of \$ _____ per share, which is the last reported sale price of our common stock on Nasdaq on July _____, 2023, and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us, and assuming no issuance of pre-funded warrants, our pro forma as adjusted net tangible book value as of March 31, 2023 would have been \$ _____ million, or \$ _____ per share. This represents an immediate increase in net tangible book value per share of \$ _____ to existing stockholders, compared to the pro forma net tangible book value per share, and immediate dilution of \$ _____ per share to investors purchasing securities in this offering. Dilution per share to investors is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the public offering price per share paid by investors in this offering. The following table illustrates this dilution on a per share basis:

Assumed public offering price per share	\$ _____
Historical net tangible book value per share	\$0.23
Increase per share attributable to pro forma adjustments	<u>0.41</u>
Pro forma net tangible book value per share at March 31, 2023	\$0.64
Increase in pro forma net tangible book value per share attributable to new investors	
Pro forma as adjusted net tangible book value per share after this offering	\$ _____
Dilution per share to investors purchasing securities in this offering	<u>\$ _____</u>

Each \$0.10 increase (decrease) in the assumed public offering price of \$ _____ per share, which is the last reported sale price of our common stock on Nasdaq on July _____, 2023, would increase (decrease) our pro forma as adjusted net tangible book value per share after this offering by approximately \$ _____ and the dilution per share to investors purchasing securities in this offering by \$ _____ assuming the number of securities offered by us, as set forth on the cover page of this prospectus, remains the same, no pre-funded warrants are issued, and after deducting underwriting discounts and commissions and estimated offering expenses payable by us. We may also increase or decrease the number of securities to be issued in this offering. Each increase (decrease) of 1.0 million shares offered by us would increase (decrease) our pro forma as adjusted net tangible book value per share and the dilution per share to investors purchasing securities in this offering by \$ _____ and \$ _____, respectively assuming that the assumed public offering price remains the same, no pre-funded warrants are issued and after deducting underwriting discounts and commissions and estimated offering expenses payable by us. The information discussed above is illustrative only and will be adjusted based on the actual public offering price and other terms of this offering as determined between us and the underwriters at pricing.

Except as otherwise indicated herein, the number of shares of our common stock to be outstanding after this offering is based on 5,078,557 shares outstanding as of March 31, 2023, and excludes:

- 1,160,114 shares of common stock issuable upon exercise of options to purchase our common stock outstanding as of March 31, 2023 at a weighted average exercise price of \$12.29 per share;
- 14,270 shares of common stock issuable upon exercise of warrants outstanding as of March 31, 2023 at an exercise price of \$201.60 per share;
- 1,114,278 shares of common stock issuable upon exercise of Series B Warrants at an exercise price of \$8.00 per share;
- 750 shares of common stock issuable upon exercise of immediately vested warrants at an exercise price of \$116.00 per share.

DESCRIPTION OF SECURITIES WE ARE OFFERING

We are offering _____ shares of our common stock or pre-funded warrants in lieu of shares of our common stock. We are also registering the shares of common stock issuable from time to time upon exercise of the pre-funded warrants offered hereby.

Common Stock

The material terms and provisions of our common stock and each other class of our securities that qualifies or limits our common stock are described in the section entitled “*Description of Capital Stock*” beginning on page 27 of this prospectus.

Pre-Funded Warrants

The following summary of certain terms and provisions of pre-funded warrants that are being offered hereby is not complete and is subject to, and qualified in its entirety by, the provisions of the pre-funded warrant, the form of which is filed as an exhibit to the registration statement of which this prospectus forms a part. Prospective investors should carefully review the terms and provisions of the form of pre-funded warrant for a complete description of the terms and conditions of the pre-funded warrants.

Duration and Exercise Price

Each pre-funded warrant offered hereby will have an initial exercise price per share equal to \$0.001. The pre-funded warrants will be immediately exercisable and may be exercised at any time until the pre-funded warrants are exercised in full. The exercise price and number of shares of common stock issuable upon exercise is subject to appropriate adjustment in the event of stock dividends, stock splits, reorganizations or similar events affecting our common stock and the exercise price.

Exercisability

The pre-funded warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of our common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of the pre-funded warrant to the extent that the holder would own more than 4.99% of the outstanding common stock immediately after exercise (the “Beneficial Ownership Limitation”), except that upon at least 61 days’ prior notice from the holder to us, the holder may increase the Beneficial Ownership Limitation to a percentage not to exceed 19.99%. No fractional shares of common stock will be issued in connection with the exercise of a pre-funded warrant. In lieu of fractional shares, we will pay the holder an amount in cash equal to the fractional amount multiplied by the exercise price.

Cashless Exercise

In lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) a reduced number of shares of common stock determined according to a formula set forth in the pre-funded warrants.

Fundamental Transaction

In the event of a fundamental transaction, as described in the pre-funded warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding common stock, or any person or group becoming the beneficial owner of 50% of the voting power represented by our outstanding common stock, the holders of the pre-funded warrants will be entitled to receive upon exercise of the pre-funded warrants the kind and amount of securities, cash or other property that the holders would have received had they exercised the pre-funded warrants immediately prior to such fundamental transaction.

Transferability

Subject to applicable laws, a pre-funded warrant may be transferred at the option of the holder upon surrender of the pre-funded warrant to us together with the appropriate instruments of transfer.

Exchange Listing

We do not intend to list the pre-funded warrants on any securities exchange or nationally recognized trading system.

Rights as a Stockholder

Except as otherwise provided in the pre-funded warrants or by virtue of such holder's ownership of shares of our common stock, the holders of the pre-funded warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their pre-funded warrants.

**MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO HOLDERS OF COMMON STOCK
AND WARRANTS**

The following is a summary of the material U.S. federal income tax consequences of the acquisition, ownership and disposition of our common stock and the pre-funded warrants, but does not purport to be a complete analysis of all the potential tax considerations relating thereto. This summary is based upon the provisions of the Internal Revenue Code of 1986, as amended, or the Code, Treasury Regulations promulgated thereunder, administrative rulings and judicial decisions, all as of the date hereof. These authorities may be changed or subject to differing interpretations, possibly with retroactive effect, so as to result in U.S. federal income tax consequences different from those set forth below. We have not sought and will not seek any ruling from the Internal Revenue Service, or the IRS, with respect to the statements made and the conclusions reached in the following summary, and there can be no assurance that the IRS or a court will agree with such statements and conclusions.

This summary also does not address the tax considerations arising under the laws of any U.S. state or local or any non-U.S. jurisdiction, estate or gift tax, the 3.8% Medicare tax on net investment income or any alternative minimum tax consequences. In addition, this discussion does not address tax considerations applicable to a holder's particular circumstances or to a holder that may be subject to special tax rules, including, without limitation:

- banks, insurance companies or other financial institutions;
- tax-exempt or government organizations;
- brokers or dealers in securities or currencies;
- traders in securities that elect to use a mark-to-market method of accounting for their securities holdings;
- persons that own, or are deemed to own, more than five percent of our capital stock;
- certain U.S. expatriates, citizens or former long-term residents of the United States;
- persons who hold our common stock and pre-funded warrants as a position in a hedging transaction, "straddle," "conversion transaction," synthetic security, other integrated investment, or other risk reduction transaction;
- persons who do not hold our common stock and pre-funded warrants as a capital asset within the meaning of Section 1221 of the Code (generally, for investment purposes);
- persons deemed to sell our common stock and pre-funded warrants under the constructive sale provisions of the Code;
- pension plans;
- partnerships, S corporations, or other entities or arrangements treated as partnerships for U.S. federal income tax purposes, or investors in any such entities;
- persons for whom our stock constitutes "qualified small business stock" within the meaning of Section 1202 of the Code;
- integral parts or controlled entities of foreign sovereigns;
- controlled foreign corporations;
- passive foreign investment companies and corporations that accumulate earnings to avoid U.S. federal income tax; or
- persons that acquire our common stock or pre-funded warrants as compensation for services.

In addition, if a partnership, including any entity or arrangement classified as a partnership for U.S. federal income tax purposes, holds our common stock or pre-funded warrants, the tax treatment of a partner generally will depend on the status of the partner, the activities of the partnership, and certain determinations made at the partner level. Accordingly, partnerships that hold our common stock or pre-funded warrants,

and partners in such partnerships, should consult their tax advisors regarding the U.S. federal income tax consequences to them of the purchase, ownership, and disposition of our common stock or pre-funded warrants.

You are urged to consult your tax advisor with respect to the application of the U.S. federal income tax laws to your particular situation, as well as any tax consequences of the purchase, ownership and disposition of our common stock or pre-funded warrants arising under the U.S. federal estate or gift tax rules or under the laws of any U.S. state or local or any non-U.S. or other taxing jurisdiction or under any applicable tax treaty.

Definition of a U.S. Holder

For purposes of this summary, a “U.S. Holder” is any beneficial owner of our common stock or pre-funded warrants that is a “U.S. person,” and is not a partnership, or an entity treated as a partnership or disregarded from its owner, each for U.S. federal income tax purposes. A U.S. person is any person that, for U.S. federal income tax purposes, is or is treated as any of the following:

- an individual who is a citizen or resident of the United States;
- a corporation created or organized under the laws of the United States, any state thereof, or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust that (1) is subject to the primary supervision of a U.S. court and the control of one or more U.S. persons (within the meaning of Section 7701(a)(30) of the Code), or (2) has a valid election in effect to be treated as a U.S. person for U.S. federal income tax purposes.

For purposes of this summary, a “Non-U.S. Holder” is any beneficial owner of our common stock or pre-funded warrants that is not a U.S. Holder or a partnership, or other entity treated as a partnership or disregarded from its owner, each for U.S. federal income tax purposes.

Treatment of Pre-funded Warrants

Although it is not entirely free from doubt, a pre-funded warrant should be treated as a share of our common stock for U.S. federal income tax purposes and a holder of pre-funded warrants should generally be taxed in the same manner as a holder of common stock, as described below. Accordingly, no gain or loss should be recognized upon the exercise of a pre-funded warrant and, upon exercise, the holding period of a pre-funded warrant should carry over to the share of common stock received. Similarly, the tax basis of the pre-funded warrant should carry over to the share of common stock received upon exercise, increased by the exercise price of \$0.001. Each holder should consult his, her or its own tax advisor regarding the risks associated with the acquisition of pre-funded warrants pursuant to this offering (including potential alternative characterizations). The balance of this discussion generally assumes that the characterization described above is respected for U.S. federal income tax purposes.

Tax Consequences to U.S. Holders

Distributions on Common Stock

As discussed above under “*Dividend Information — Dividend Policy*,” we do not currently expect to make distributions on our common stock. In the event that we do make distributions of cash or other property, distributions paid on common stock, other than certain pro rata distributions of common stock, will be treated as a dividend to the extent paid out of our current or accumulated earnings and profits and will be includible in income by the U.S. Holder and taxable as ordinary income when received. If a distribution exceeds our current and accumulated earnings and profits, the excess will be first treated as a tax-free return of the U.S. Holder’s investment, up to the U.S. Holder’s tax basis in the common stock. Any remaining excess will be treated as a capital gain. Subject to applicable limitations, dividends paid to certain non-corporate U.S. Holders may be eligible for taxation as “qualified dividend income” and therefore may be taxable at rates applicable to long-term capital gains. U.S. Holders should consult their tax advisers regarding the availability of the reduced tax rate on dividends in their particular circumstances. Dividends received by a corporate

U.S. Holder will be eligible for the dividends-received deduction if the U.S. Holder meets certain holding period and other applicable requirements.

Sale or Other Disposition of Common Stock

For U.S. federal income tax purposes, gain or loss realized on the sale or other disposition of common stock will be capital gain or loss, and will be long-term capital gain or loss if the U.S. Holder held the common stock for more than one year. The amount of the gain or loss will equal the difference between the U.S. Holder's tax basis in the common stock disposed of and the amount realized on the disposition. Long-term capital gains recognized by non-corporate U.S. Holders will be subject to reduced tax rates. The deductibility of capital losses is subject to limitations.

Tax Consequences to Non-U.S. Holders

Distributions

As discussed in the section entitled "*Dividend Information — Dividend Policy*," we do not anticipate paying any dividends on our common stock in the foreseeable future. If we make distributions on our common stock, those payments will constitute dividends for U.S. federal income tax purposes to the extent we have current or accumulated earnings and profits, as determined under U.S. federal income tax principles. To the extent those distributions exceed both our current and our accumulated earnings and profits, they will constitute a return of capital and will first reduce a Non-U.S. Holder's basis in our common stock but not below zero. Any excess will be treated as capital gain and will be treated as described below under the "*Gain on Sale or Other Disposition of Common Stock*" section. Any such distributions would be subject to the discussions below regarding back-up withholding and Foreign Account Tax Compliance Act, or FATCA.

Subject to the discussion below on effectively connected income, any dividend paid to a Non-U.S. Holder generally will be subject to U.S. withholding tax either at a rate of 30% of the gross amount of the dividend or such lower rate as may be specified by an applicable income tax treaty. To receive a reduced treaty rate, a Non-U.S. Holder must provide us or our agent with an IRS Form W-8BEN, IRS Form W-8 BEN-E or another appropriate version of IRS Form W-8 (or a successor form), which must be updated periodically, and which, in each case, must certify qualification for the reduced rate. Non-U.S. Holders should consult their tax advisors regarding their entitlement to benefits under any applicable income tax treaty.

Dividends paid to a Non-U.S. Holder that are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States and that are not eligible for relief from U.S. (net basis) income tax under an applicable income tax treaty, generally are exempt from the (gross basis) withholding tax described above. To obtain this exemption from withholding tax, the Non-U.S. Holder must provide the applicable withholding agent with an IRS Form W-8ECI or successor form or other applicable IRS Form W-8 certifying under penalty of perjury that the dividends are effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States. Such effectively connected dividends, if not eligible for relief under a tax treaty, would not be subject to a withholding tax, but would be taxed at the same graduated rates applicable to U.S. persons, net of certain deductions and credits and if, in addition, the Non-U.S. Holder is a corporation, may also be subject to a branch profits tax at a rate of 30% (or such lower rate as may be specified by an applicable income tax treaty).

If you are eligible for a reduced rate of withholding tax pursuant to a tax treaty, you may be able to obtain a refund of any excess amounts withheld if you timely file an appropriate claim for refund with the IRS.

Gain on Sale or Other Disposition of Common Stock

Subject to the discussion below regarding backup withholding and FATCA, a Non-U.S. Holder generally will not be required to pay U.S. federal income tax on any gain realized upon the sale or other disposition of our common stock unless:

- the gain is effectively connected with the Non-U.S. Holder's conduct of a trade or business within the United States and not eligible for relief under an applicable income tax treaty, in which case the

Non-U.S. Holder will be required to pay tax on the net gain derived from the sale under regular graduated U.S. federal income tax rates, and for a Non-U.S. Holder that is a corporation, such Non-U.S. Holder may be subject to the branch profits tax at a 30% rate (or such lower rate as may be specified by an applicable income tax treaty) on such effectively connected gain, as adjusted for certain items;

- the Non-U.S. Holder is an individual who is present in the United States for a period or periods aggregating 183 days or more during the calendar year in which the sale or disposition occurs and certain other conditions are met, in which case the Non-U.S. Holder will be required to pay a flat 30% tax on the gain derived from the sale, which tax may be offset by U.S. source capital losses (even though the Non-U.S. Holder is not considered a resident of the United States) (subject to applicable income tax or other treaties); or
- we are a “U.S. real property holding corporation” (USRPHC) for U.S. federal income tax purposes, or a USRPHC, at any time within the shorter of the five-year period preceding the disposition or the Non-U.S. Holder’s holding period for our common stock. We believe we are not currently and do not anticipate becoming a USRPHC. However, because the determination of whether we are a USRPHC depends on the fair market value of our United States real property interests relative to the fair market value of our other business assets, there can be no assurance that we will not become a USRPHC in the future. Even if we become a USRPHC, however, gain arising from the sale or other taxable disposition by a Non-U.S. Holder of our common stock will not be subject to United States federal income tax if in the case of our common stock, (a) shares of our common stock are “regularly traded,” as defined by applicable Treasury Regulations, on an established securities market, such as Nasdaq, and (b) the Non-U.S. Holder owns or owned, actually and constructively, 5% or less of the shares of our common stock throughout the five-year period ending on the date of the sale or exchange. If the foregoing exceptions do not apply, such Non-U.S. Holder’s proceeds received on the disposition of shares will generally be subject to withholding at a rate of 15% and such Non-U.S. Holder will generally be taxed on any gain in the same manner as gain that is effectively connected with the conduct of a U.S. trade or business, except that the branch profits tax generally will not apply.

Information Reporting and Backup Withholding

Information returns may be filed with the IRS in connection with distributions on common stock, and the proceeds of a sale or other disposition of common stock. A non-exempt U.S. Holder may be subject to U.S. backup withholding on these payments if it fails to provide its taxpayer identification number to the withholding agent and comply with certification procedures or otherwise establish an exemption from backup withholding.

A Non-U.S. Holder may be subject to U.S. information reporting and backup withholding on these payments unless the Non-U.S. Holder complies with certification procedures to establish that it is not a U.S. person (within the meaning of the Code). The certification requirements generally will be satisfied if the Non-U.S. Holder provides the applicable withholding agent with a statement on the applicable IRS Form W-8BEN or IRS Form W-8BEN-E (or suitable substitute or successor form), together with all appropriate attachments, signed under penalties of perjury, stating, among other things, that such Non-U.S. Holder is not a U.S. Person. Applicable Treasury Regulations provide alternative methods for satisfying this requirement. In addition, the amount of distributions on common stock or constructive dividends on common stock paid to a Non-U.S. Holder, and the amount of any U.S. federal tax withheld therefrom, must be reported annually to the IRS and the holder. This information may be made available by the IRS under the provisions of an applicable tax treaty or agreement to the tax authorities of the country in which the Non-U.S. Holder resides.

Payment of the proceeds of the sale or other disposition of common stock to or through a non-U.S. office of a U.S. broker or of a non-U.S. broker with certain specified U.S. connections generally will be subject to information reporting requirements, but not backup withholding, unless the Non-U.S. Holder certifies under penalties of perjury that it is not a U.S. person or an exemption otherwise applies. Payments of the proceeds of a sale or other disposition of common stock to or through a U.S. office of a broker generally will be subject to information reporting and backup withholding, unless the Non-U.S. Holder certifies under penalties of perjury that it is not a U.S. person or otherwise establishes an exemption.

Backup withholding is not an additional tax. The amount of any backup withholding from a payment generally will be allowed as a credit against the holder's U.S. federal income tax liability and may entitle the holder to a refund, provided that the required information is timely furnished to the IRS.

Foreign Account Tax Compliance Act

FATCA imposes withholding tax on certain types of payments made to foreign financial institutions and certain other non-U.S. entities. The legislation imposes a 30% withholding tax on dividends on, or, subject to the discussion of certain proposed Treasury Regulations below, gross proceeds from the sale or other disposition of, our common stock paid to a "foreign financial institution" or to certain "non-financial foreign entities" (each as defined in the Code), unless (i) the foreign financial institution undertakes certain diligence and reporting obligations, (ii) the non-financial foreign entity either certifies it does not have any "substantial United States owners" (as defined in the Code) or furnishes identifying information regarding each substantial United States owner, or (iii) the foreign financial institution or non-financial foreign entity otherwise qualifies for an exemption from these rules. If the payee is a foreign financial institution and is subject to the diligence and reporting requirements in (i) above, it must enter into an agreement with the U.S. Treasury requiring, among other things, that it undertake to identify accounts held by "specified United States persons" or "United States-owned foreign entities" (each as defined in the Code), annually report certain information about such accounts, and withhold 30% on payments to account holders whose actions prevent it from complying with these reporting and other requirements. If the country in which a payee is resident has entered into an "intergovernmental agreement" with the United States regarding FATCA, that agreement may permit the payee to report to that country rather than to the U.S. Department of the Treasury. The U.S. Treasury recently released proposed Treasury Regulations which, if finalized in their present form, would eliminate the federal withholding tax of 30% applicable to the gross proceeds of a sale or other disposition of our common stock. In its preamble to such proposed Treasury Regulations, the U.S. Treasury stated that taxpayers may generally rely on the proposed regulations until final regulations are issued. Prospective investors should consult their own tax advisors regarding the possible impact of these rules on their investment in our common stock, and the possible impact of these rules on the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of this 30% withholding tax under FATCA.

The preceding discussion of U.S. federal tax considerations is for general information only. It is not tax advice. Each prospective investor should consult its tax advisor regarding the particular U.S. federal, state and local and non-U.S. tax consequences of purchasing, holding and disposing of our common stock, including the consequences of any proposed change in applicable laws.

UNDERWRITING

We and the underwriters named below have entered into an underwriting agreement with respect to the shares of common stock or pre-funded warrants being offered. Maxim Group LLC is acting as the sole book-running manager and representative of the underwriters in this offering. In connection with this offering and subject to certain terms and conditions, the underwriters have agreed to purchase, and we have agreed to sell, all of the securities in this offering to the underwriters.

Underwriter	Number of Shares	Number of Pre-funded Warrants
Maxim Group LLC		
Total		

The underwriters have agreed to purchase all the securities offered by us, and the underwriters' obligations are several, which means that each underwriter is required to purchase a specific number of shares of common stock and/or pre-funded warrants but is not responsible for the commitment of any other underwriter to purchase any securities. The obligations of the underwriters may be terminated upon the occurrence of certain events specified in the underwriting agreement. Furthermore, pursuant to the underwriting agreement, the underwriters' obligations are subject to customary conditions and representations and warranties contained in the underwriting agreement, such as receipt by the underwriters of officers' certificates and legal opinions.

The underwriters are offering the securities, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by the representative's counsel and other conditions specified in the underwriting agreement. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Over-allotment Option

We have also granted the underwriters an option, exercisable for up to 45 days from the date of this prospectus, to purchase up to an additional _____ shares of common stock and/or pre-funded warrants at the public offering price, less underwriting discounts and commissions. The underwriters may exercise the option solely to cover over-allotments. If the over-allotment option is exercised in full, the total public offering price, underwriting compensation (including discounts, but not including any other compensation described hereunder) and proceeds to us before offering expenses will be approximately \$ _____ million, \$ _____ million and \$ _____ million, respectively, and excluding the proceeds, if any, from the exercise of the pre-funded warrants offered hereby.

Indemnification

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act and liabilities arising from breaches of representations and warranties contained in the underwriting agreement, or to contribute to payments that the underwriters may be required to make in respect of those liabilities.

Underwriter Compensation

We have agreed to sell the securities to the underwriters at the offering price of \$ _____ per share of common stock (or \$ _____ per pre-funded warrant), which represents the offering price of such securities set forth on the cover page of this prospectus, less the applicable underwriting discount.

Discounts, Commissions and Expenses

The underwriters have advised us that they propose to offer the shares of common stock at the public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of \$ _____ per share of common stock. After this offering, the public offering price and concession to dealers may be changed by the representative. No such change shall change the amount

of proceeds to be received by us as set forth on the cover page of this prospectus. The shares of common stock are offered by the underwriters as stated herein, subject to receipt and acceptance by them and subject to their right to reject any order in whole or in part. The underwriters have informed us that they do not intend to confirm sales to any accounts over which they exercise discretionary authority.

The following table presents the underwriting discount. These amounts are shown assuming both no exercise and full exercise of the over-allotment option.

	Per Share	Per Pre-Funded Warrant	Total without Over-Allotment Option	Total with Over-Allotment Option
Public offering price	\$	\$	\$	\$
Underwriting discount	\$	\$	\$	\$
Proceeds to us, before expenses ⁽¹⁾	\$	\$	\$	\$

(1) Excluding the proceeds, if any, from the exercise of the pre-funded warrants.

We estimate that the total expenses of the offering payable by us, excluding the total underwriting discount, will be approximately \$. We have agreed to reimburse the underwriters up to an aggregate of \$85,000 for fees and expenses incurred by them in connection with this offering. In accordance with FINRA Rule 5110, these reimbursed fees and expenses may be deemed to be underwriting compensation in connection with this offering.

Lock-Up Agreements and Trading Restrictions

Our executive officers and directors have agreed to a three-month “lock-up” from the effective date of this prospectus, pursuant to which the signatories to such agreements have agreed not to sell, pledge or otherwise dispose of any shares of common stock that they beneficially own, including the issuance of common stock upon the exercise of currently outstanding convertible securities and options and options which may be issued, without the prior written consent of the representative.

The representative has no present intention to waive or shorten the lock-up period; however, the terms of the lock-up agreements may be waived at its discretion. In determining whether to waive the terms of the lockup agreements, the representative may base its decision on its assessment of the relative strengths of the securities markets and companies similar to ours in general, and the trading pattern of, and demand for, our securities in general.

In addition, the underwriting agreement provides that we will not, for a period of three months following the effective date of this prospectus, offer, sell or distribute any of our securities, without the prior written consent of the representative, subject to certain exceptions.

Stabilization

The rules of the SEC generally prohibit the underwriters from trading in our securities on the open market during this offering. However, the underwriters are allowed to engage in some open market transactions and other activities during this offering that may cause the market price of our securities to be above or below that which would otherwise prevail in the open market. These activities may include stabilization, short sales and over-allotments, syndicate covering transactions and penalty bids.

- Stabilizing transactions consist of bids or purchases made for the purpose of preventing or slowing a decline in the market price of our securities prior to the closing of this offering.
- Short sales occur when the underwriters sell more shares of common stock than they purchase from us in this offering. To cover the resulting short position, the representative may exercise the over-allotment option described above or may engage in syndicate covering transactions. There is no contractual limit on the size of any syndicate covering transaction.
- Syndicate covering transactions are bids for or purchases of our securities on the open market by the representative in order to reduce a short position. Similar to other purchase transactions, the

underwriters' purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock.

- Penalty bids permit the representative to reclaim a selling concession from a syndicate member when the shares of common stock originally sold by the syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions.

If the underwriters commence these activities, they may discontinue them at any time without notice. The underwriters will carry out any such transactions on The Nasdaq Capital Market.

Listing

Our common stock is listed on The Nasdaq Capital Market under the symbol "YTEN."

Electronic Distribution

A prospectus in electronic format may be made available on websites or through other online services maintained by the underwriters of this offering, or by their affiliates. Other than the prospectus in electronic format, the information on any underwriters' website and any information contained in any other website maintained by an underwriter is not part of this prospectus or the registration statement of which this prospectus forms a part, has not been approved and/or endorsed by us or the representative in its capacity as an underwriter.

Other Relationships

The representative and its affiliates have engaged in, and may in the future engage in, investment banking and other commercial dealings in the ordinary course of business with us or our affiliates. They have received, or may in the future receive, customary fees and commissions for these transactions. In the course of its businesses, the representative and its affiliates may actively trade our securities or loans for its own account or for the accounts of customers, and, accordingly, the representative and its affiliates may at any time hold long or short positions in such securities or loans.

Except for services provided in connection with this offering, the representative has not provided any investment banking or other financial services during the 180-day period preceding the date of this prospectus and we do not expect to retain the representative to perform any investment banking or other financial services for at least 90 days after the date of this prospectus.

Notice to Investors in the United Kingdom

In relation to the United Kingdom, no securities have been offered or will be offered pursuant to the offer described herein to the public in the United Kingdom prior to the publication of a prospectus in relation to the securities which has been approved by the UK Financial Conduct Authority, except that the securities may be offered to the public in the United Kingdom at any time:

- i. to any legal entity which is a qualified investor as defined under Article 2 of the UK Prospectus Regulation;
- ii. to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the UK Prospectus Regulation), subject to obtaining the prior consent of the underwriter for any such offer; or
- iii. in any other circumstances falling within Section 86 of the Financial Services and Markets Act 2000 (as amended) (the "FSMA"),

provided that no such offer of the securities shall require the issuer or any underwriter to publish a prospectus pursuant to Section 85 of the FSMA or supplement a prospectus pursuant to Article 23 of the UK Prospectus Regulation.

Each person in the United Kingdom who acquires any securities in the offer or to whom any offer is made will be deemed to have represented, acknowledged and agreed to and with the issuer and the underwriter that it is a qualified investor within the meaning of the UK Prospectus Regulation.

In the case of any securities being offered to a financial intermediary as that term is used in Article 5(1) of the UK Prospectus Regulation, each such financial intermediary will be deemed to have represented, acknowledged and agreed to and with the issuer and the underwriter that the securities acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer to the public other than their offer or resale in the United Kingdom to qualified investors, in circumstances in which the prior consent of the underwriter has been obtained to each such proposed offer or resale. Neither the issuer nor the underwriter have authorized, nor do they authorize, the making of any offer of securities through any financial intermediary, other than offers made by the underwriter which constitute the final placement of securities contemplated in this document.

The issuer and the underwriter and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

For the purposes of this provision, the expression an “offer to the public” in relation to the securities in the United Kingdom means the communication in any form and by any means of sufficient information on the terms of the offer and any securities to be offered so as to enable an investor to decide to purchase or subscribe for any securities and the expression “UK Prospectus Regulation” means Regulation (EU) 2017/1129 as it forms part of United Kingdom law by virtue of the European Union (Withdrawal) Act 2018.

In the United Kingdom, this document is being distributed only to, and is directed only at, persons who are “qualified investors” within the meaning of Article 2(e) of the UK Prospectus Regulation who are also: (i) persons who fall within the definition of “investment professionals” in Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the “Order”); (ii) persons falling within Article 49(2) of the Order; or (iii) persons to whom it may otherwise lawfully be communicated (all such persons together being referred to as “relevant persons”). This document must not be acted on or relied on in the United Kingdom by persons who are not relevant persons. Any investment or investment activity to which this document relates is available in the United Kingdom only to relevant persons and will be engaged in only with such persons.

Any invitation or inducement to engage in investment activity (within the meaning of Section 21 of the FSMA) may only be communicated or caused to be communicated in connection with the issue or sale of the securities in circumstances in which Section 21(1) of the FSMA does not apply. All applicable provisions of the FSMA and the Order must be complied with in respect of anything done by any person in relation to the securities in, from or otherwise involving the United Kingdom.

Notice to Investors in the European Economic Area

In relation to each member state of the European Economic Area (each a “Member State”), no securities have been offered or will be offered pursuant to the offer described herein in that Member State prior to the publication of a prospectus in relation to the securities which has been approved by the competent authority in that Member State or, where appropriate, approved in another Member State and notified to the relevant competent authority in that Member State, all in accordance with the Prospectus Regulation, except that the securities may be offered to the public in that Member State at any time:

- i. to any legal entity which is a qualified investor as defined under Article 2 of the Prospectus Regulation;
- ii. to fewer than 150 natural or legal persons (other than qualified investors as defined under Article 2 of the Prospectus Regulation), subject to obtaining the prior consent of the underwriter for any such offer; or
- iii. in any other circumstances falling within Article 1(4) of the Prospectus Regulation,

provided that no such offer of securities shall require the issuer or any underwriter to publish a prospectus pursuant to Article 3 of the Prospectus Regulation or supplement a prospectus pursuant to Article 23 of the Prospectus Regulation.

Each person in a Member State who acquires any securities in the offer or to whom any offer is made will be deemed to have represented, acknowledged and agreed to and with the issuer and the underwriter that it is a qualified investor within the meaning of the Prospectus Regulation.

In the case of any securities being offered to a financial intermediary as that term is used in Article 5(1) of the Prospectus Regulation, each such financial intermediary will be deemed to have represented, acknowledged and agreed to and with the issuer and the underwriter that the securities acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer to the public other than their offer or resale in a Member State to qualified investors, in circumstances in which the prior consent of the underwriter has been obtained to each such proposed offer or resale. Neither the issuer nor the underwriter have authorized, nor do they authorize, the making of any offer of securities through any financial intermediary, other than offers made by the underwriter which constitute the final placement of securities contemplated in this document.

The issuer and the underwriter and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

For the purposes of this provision, the expression an “offer to the public” in relation to any securities in any Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any securities to be offered so as to enable an investor to decide to purchase, or subscribe for, any securities and the expression “Prospectus Regulation” means Regulation (EU) 2017/1129.

In Member States, this document is being distributed only to, and is directed only at, persons who are “qualified investors” within the meaning of Article 2(e) of the Prospectus Regulation (“Qualified Investors”). This document must not be acted on or relied on in any Member State by persons who are not Qualified Investors. Any investment or investment activity to which this document relates is available in any Member State only to Qualified Investors and will be engaged in only with such persons.

DESCRIPTION OF CAPITAL STOCK**General**

The following summary of our capital stock is based on certain provisions of our amended and restated certificate of incorporation, as amended, and amended and restated by-laws and on the applicable provisions of the Delaware General Corporation Law (the "DGCL"). This summary does not purport to be complete and is qualified in its entirety by reference to the applicable provisions in our amended and restated certificate of incorporation, as amended, and amended and restated by-laws and the DGCL. For a complete description you should refer to our amended and restated certificate of incorporation, as amended, and our amended and restated by-laws, copies of which have been incorporated by reference herein, and to the applicable provisions of the DGCL.

Our authorized capital stock consists of 65,000,000 shares, with a par value of \$0.01 per share, of which:

- 60,000,000 shares are designated as common stock; and
- 5,000,000 shares are designated as preferred stock. Previously issued shares of Series A Convertible Preferred Stock and Series B Convertible Preferred Stock have been fully converted to common stock and are no longer outstanding.

Common Stock

The holders of our common stock are entitled to one vote per share on all matters submitted to a vote of our stockholders and do not have cumulative voting rights. Subject to preferences that may be applicable to any preferred stock outstanding at the time, the holders of outstanding shares of common stock are entitled to receive ratably any dividends declared by our board of directors out of assets legally available. Upon our liquidation, dissolution or winding up, holders of our common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preference of any then outstanding shares of preferred stock. Holders of common stock have no preemptive or conversion rights or other subscription rights. There are no redemption or sinking fund provisions applicable to our common stock.

Preferred Stock

Our amended and restated certificate of incorporation, as amended, provides for a class of authorized stock known as preferred stock, consisting of 5,000,000 shares, \$0.01 par value per share, issuable from time to time in one or more series. Our board of directors may designate the rights, preferences, privileges and restrictions of the preferred stock, including dividend rights, conversion rights, voting rights, terms of redemption, liquidation preference, sinking fund terms and the number of shares constituting any series or the designation of any series.

Warrants

As of June 30, 2023, we had warrants outstanding to purchase 2,136,008 shares of our common stock.

Anti-Takeover Provisions

Certain provisions of the DGCL and our amended and restated certificate of incorporation, as amended, and amended and restated by-laws may have the effect of delaying, deferring or discouraging another party from acquiring control of our company. These provisions, which are summarized below, may discourage certain types of coercive takeover practices and inadequate takeover bids and encourage anyone seeking to acquire control of our company to first negotiate with our board of directors. These provisions might also have the effect of preventing changes in our management and could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, because, among other reasons, the negotiation of such proposals could result in improving their terms.

Amended and Restated Certificate of Incorporation and Bylaw Provisions

Our amended and restated certificate of incorporation, as amended, and amended and restated by-laws include a number of provisions that may have the effect of delaying, deferring or discouraging another party from acquiring control of our company or preventing changes in our management, including the following:

- *Issuance of Undesignated Preferred Stock.* Our board of directors has the authority, without further action by the stockholders, to issue up to 5,000,000 shares of undesignated preferred stock with rights, preferences and privileges designated from time to time by our board of directors without further action by stockholders. These rights, preferences and privileges could include dividend rights, conversion rights, voting rights, terms of redemption, liquidation preferences and sinking fund terms, any or all of which may be greater than the rights of common stock.
- *Size of the Board of Directors and Filling Vacancies.* The number of directors constituting our board of directors may be set only by resolution adopted by a majority vote of our entire board of directors. Any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of the board of directors, may only be filled by the affirmative vote of a majority of our directors then in office, even if less than a quorum.
- *Classified Board.* Our board of directors is divided into three classes of directors, with staggered three-year terms. Only one class of directors will be elected at each annual meeting of our stockholders, with the other classes continuing for the remainder of their respective three-year terms.
- *No Cumulative Voting.* Our amended and restated certificate of incorporation, as amended, and amended and restated by-laws do not permit cumulative voting in the election of directors. Cumulative voting allows a stockholder to vote a portion, or all of its shares for one or more candidates. The absence of cumulative voting makes it more difficult for a minority stockholder to gain a seat.
- *Removal of Directors.* Directors can only be removed by our stockholders for cause and removal of a director will require a 75% stockholder vote.
- *No Written Consent of Stockholders.* All stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting. Stockholders may not take action by written consent in lieu of a meeting. The inability of stockholders to take action by written consent means that a stockholder would need to wait until the next annual or special meeting to bring business before the stockholders for a vote.
- *Special Meetings of Stockholders.* Special meetings of our stockholders may be called only by our board of directors acting pursuant to a resolution approved by the affirmative vote of a majority of the directors then in office. Only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of our stockholders.
- *Advance Notice Requirements for Stockholder Proposals and Director Nominations.* Our amended and restated by-laws provide advance notice procedures for stockholders seeking to bring business before our annual meeting of stockholders or to nominate candidates for election as directors at our annual meeting of stockholders. These procedures provide that notice must be given in writing not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the first anniversary of the preceding year's annual meeting. These procedures may have the effect of precluding the conduct of certain business at a meeting if the proper procedures are not followed or may discourage or deter a potential acquirer from conducting a solicitation of proxies to elect its own slate of directors or otherwise attempt to obtain control of us.
- *Amendment to Amended and Restated Certificate of Incorporation and By-laws.* Any amendment, repeal or modification of certain provisions of our amended and restated certificate of incorporation or amended and restated by-laws requires a 75% stockholder vote. Provisions requiring such supermajority vote include, among other things, any amendment, repeal or modification of the provisions relating to the classification of our board of directors, the requirement that stockholder actions be effected at a duly called annual or special meeting of our stockholders and the designated parties entitled to call a special meeting of our stockholders.

Section 203 of the DGCL

We are subject to Section 203 of the DGCL. In general, Section 203 of the DGCL prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless it satisfies one of the following conditions:

- the transaction is approved by the board of directors prior to the time that the interested stockholder became an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced; or
- at or subsequent to such time that the stockholder became an interested stockholder, the business combination was approved by the board of directors and authorized at an annual or special meeting of stockholders by at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

In general, Section 203 defines “business combination” to include the following:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, lease, exchange, mortgage, pledge, transfer or other disposition of the assets of the corporation with an aggregate market value of 10% or more of either the aggregate market value of all assets of the corporation on a consolidated basis or the aggregate market value of all of the outstanding stock of the corporation involving the interested stockholder;
- subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder;
- any transaction involving the corporation that has the effect of increasing the proportionate share of the stock or any class or series of the corporation beneficially owned by the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits by or through the corporation.

In general, Section 203 defines an “interested stockholder” as an entity or person who, together with the stockholder’s affiliates and associates (as defined in Section 203), beneficially owns, or within three years prior to the time of determination of interested stockholder status did own, 15% or more of the outstanding voting stock of the corporation.

Treatment of Options Upon Change of Control

In general, under the terms of our equity incentive plans and our executive employment agreements, in the event of certain change in control transactions, if the successor corporation does not assume our outstanding options or issue replacement awards, or if an option holder’s employment is involuntarily terminated in connection with such change in control, the vesting of the options outstanding under such plans will accelerate.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC. The transfer agent’s telephone number is (718) 921-8200.

Stock Exchange Listing

Our common stock is listed on the Nasdaq Capital Market under the symbol “YTEN”.

**DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT
LIABILITIES**

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers, and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

LEGAL MATTERS

Covington & Burling, LLP, Boston, Massachusetts, will pass upon the validity of the securities offered by this prospectus. Pryor Cashman LLP, New York, New York is acting as counsel for the underwriters in connection with this offering.

EXPERTS

The consolidated financial statements of Yield10 Bioscience, Inc. as of December 31, 2022 and 2021 and for each of the years in the two-year period ended December 31, 2022, incorporated in this Prospectus by reference from the Yield10 Bioscience, Inc. [Annual Report on Form 10-K for the year ended December 31, 2022](#) have been audited by RSM US LLP, an independent registered public accounting firm, as stated in their report thereon (which report expresses an unqualified opinion and includes an explanatory paragraph relating to the Yield10 Bioscience, Inc.'s ability to continue as a going concern), incorporated herein by reference, and have been incorporated in this Prospectus and Registration Statement in reliance upon such report and upon the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and other periodic reports, proxy statements and other information with the SEC. You can read our SEC filings over the Internet at the SEC's website at www.sec.gov.

Our Internet address is www.yield10bio.com. There we make available free of charge, on or through the investor relations section of our website, annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with the SEC. The information found on our website is not part of this prospectus supplement or the accompanying prospectus and our website address is included as an inactive textual link only.

The SEC maintains a website at <http://www.sec.gov> that contains reports, proxy and information statements and other information regarding issuers that file electronically with the SEC.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to “incorporate by reference” much of the information we file with them, which means that we can disclose important information to you by referring you to those publicly available documents. The information that we incorporate by reference in this prospectus is considered to be part of this prospectus. Because we are incorporating by reference future filings with the SEC, this prospectus is continually updated and those future filings may modify or supersede some of the information included or incorporated in this prospectus. You should refer to the registration statement, including the exhibits, for further information about us and the securities we may offer pursuant to this prospectus. Statements in this prospectus regarding the provisions of certain documents filed with, or incorporated by reference in, the registration statement are not necessarily complete and each statement is qualified in all respects by that reference. We incorporate by reference into this prospectus the documents listed below and any future filings made by us with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (1) after the date of this prospectus and prior to the time that all of the securities offered by this prospectus are sold or the earlier termination of the offering, and (2) after the date of the initial registration statement of which this prospectus forms a part and prior to the effectiveness of the registration statement (except in each case in which the information contained in such documents is “furnished” and not “filed”). The documents we are incorporating by reference as of their respective dates of filing are:

- [Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on March 14, 2023;](#)
- [Definitive Proxy Statement on Schedule 14A for the annual meeting of our stockholders held on May 25, 2023, filed with the SEC on April 6, 2023;](#)
- [Quarterly Report on Form 10-Q for the quarter ended March 31, 2023, filed with the SEC on May 12, 2023;](#)
- Current Reports on Form 8-K filed on [January 24, 2023](#), [May 1, 2023](#), [May 3, 2023](#), [May 4, 2023](#), [May 19, 2023](#) and [May 30, 2023](#); and
- [The description of our common stock contained in Item 1 of our Registration Statement on Form 8-A filed with the SEC on November 6, 2006, including any amendments or reports filed for the purpose of updating the description.](#)

The SEC file number for our filings made under the Exchange Act is 001-33133. We will provide, without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request of such person, a copy of any or all of the documents incorporated herein by reference other than exhibits, unless such exhibits are specifically incorporated by reference into such documents or this document. Requests for such documents should be addressed in writing or by telephone to:

Investor Relations
Yield10 Bioscience, Inc.
19 Presidential Way
Woburn, Massachusetts 01801
(617) 583-1700



YIELD10 BIOSCIENCE, INC.

Shares of Common Stock

Pre-Funded Warrants to Purchase Shares of Common Stock

Shares of Common Stock Underlying Pre-Funded Warrants

PRELIMINARY PROSPECTUS
, 2023

Sole Book-Running Manager

Maxim Group LLC

PART II — INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The following table sets forth the costs and expenses, payable by the Company in connection with the registration and sale of the common stock being registered. All amounts are estimates except the SEC registration fee and FINRA filing fee.

	Amount to be paid (\$)
SEC registration fee	\$1,322.40
FINRA filing fee	*
Legal fees and expenses	*
Accounting fees and expenses	*
Other	*
Total	\$ *

* To be provided by amendment.

Item 14. Indemnification of Directors and Officers.

Pursuant to Section 145 of the DGCL, our amended and restated by-laws provide that each director or officer of Yield10 Bioscience, who was or is made a party or is threatened to be made a party to or is involved in any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative, by reason of the fact that he or she, or a person of whom he or she is the legal representative, is or was a director or officer of Yield10 Bioscience, or is or was serving at the request of Yield10 Bioscience as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust or other enterprise, including service with respect to employee benefit plans, shall be indemnified and held harmless by Yield10 Bioscience to the fullest extent authorized by the DGCL.

Pursuant to Section 102(b)(7) of the DGCL, Article 7 of our amended and restated certificate of incorporation, as amended, eliminates the liability of a director to us or our stockholders for monetary damages for such a breach of fiduciary duty as a director, except for liabilities arising:

- from any breach of the director's duty of loyalty to us or our stockholders;
- from acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law;
- under Section 174 of the Delaware General Corporation Law; and
- from any transaction from which the director derived an improper personal benefit.

We carry insurance policies insuring our directors and officers against certain liabilities that they may incur in their capacity as directors and officers. In addition, we have entered into indemnification agreements with our directors and officers.

The foregoing discussion of our certificate of incorporation, bylaws and Delaware law is not intended to be exhaustive and is qualified in its entirety by such certificate of incorporation, bylaws or law.

Item 15. Recent Sales of Unregistered Securities

On January 4, 2023, the Company issued 17,578 shares of common stock to participants in its Yield10 Bioscience, Inc. 401(k) Plan as quarterly matching contributions. On April 6, 2023, the Company issued 9,438 shares of common stock to participants in the Yield10 Bioscience, Inc. 401(k) Plan as a matching contribution. Each of these issuances of securities is exempt from registration pursuant to Section 3(a)(2) of the Securities Act as exempted securities. On May 3, 2023, the Company issued warrants to purchase 1,006,710 shares of common stock pursuant to the Securities Purchase Agreement by and among the

Company, Jack W. Schuler Living Trust and Armistice Capital Master Fund Ltd. for gross proceeds of \$3.0 million. The issuance and sale of the securities in this private placement was exempt from registration pursuant to Section 4(a)(2) and/or Rule 506 of the Securities Act.

Item 16. Exhibits and Financial Statement Schedules.

- (a) The exhibits listed below are filed as part of or incorporated by reference into this Registration Statement on Form S-1. Where certain exhibits are incorporated by reference from a previous filing, the exhibit numbers and previous filings are identified in parentheses.

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
1.1*	Underwriting Agreement				
3.1.1	Amended and Restated Certificate of Incorporation, as amended, of the Registrant.		Form 10-Q (Exhibit 3.1)	8/9/2018	001-33133
3.1.2	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the Registrant.		Form 8-K (Exhibit 3.1)	1/15/2020	001-33133
3.2	Amended and Restated By-laws of the Registrant.		Form 10-Q (Exhibit 3.1)	11/10/2021	001-33133
4.1	Specimen Stock Certificate for shares of the Registrant's Common Stock.		Form 10-Q (Exhibit 4.1)	11/12/2020	001-33133
4.2	Form of Investor Warrant to Purchase Common Stock.		Form 8-K (Exhibit 4.1)	7/5/2017	001-33133
4.3	Form of Series A Common Warrant to purchase shares of Common Stock.		Form S-1/A (Exhibit 4.3)	12/15/2017	333-221283
4.4	Form of Common Stock Purchase Warrant.		Form 8-K (Exhibit 4.1)	11/20/2019	001-33133
4.5	Senior Unsecured Convertible Promissory Note, dated as of April 28, 2023, between the Company and MPC Investment LLC.		Form 8-K (Exhibit 4.1)	5/1/2023	001-33133
4.6	Form of Pre-Funded Common Stock Purchase Warrant		Form 8-K (Exhibit 4.1)	5/4/2023	001-33133
4.7	Form of Common Stock Purchase Warrant		Form 8-K (Exhibit 4.2)	5/4/2023	001-33133
4.8*	Form of Pre-funded Warrant				
5.1*	Opinion of Covington & Burling LLP				
10.1†	2006 Stock Option and Incentive Plan.		Form S-1/A (Exhibit 10.3)	10/20/2006	333-135760
10.1.1†	2006 Stock Option and Incentive Plan, Form of Incentive Stock Option Agreement.		Form S-1/A (Exhibit 10.3.1)	10/20/2006	333-135760

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
10.1.2†	2006 Stock Option and Incentive Plan, Form of Non-Qualified Stock Option Agreement.		Form S-1/A (Exhibit 10.3.2)	10/20/2006	333-135760
10.1.3†	2006 Stock Option and Incentive Plan, Form of Director Non-Qualified Stock Option Agreement.		Form S-1/A (Exhibit 10.3.3)	10/20/2006	333-135760
10.2†	2014 Stock Option and Incentive Plan, Revised and Restated.		Form 10-Q (Exhibit 10.1)	8/13/2015	001-33133
10.2.1†	2014 Stock Option and Incentive Plan, Form of Incentive Stock Option Award.		Form 10-K (Exhibit 10.3.1)	3/25/2015	001-33133
10.2.2†	2014 Stock Option and Incentive Plan, Form of Non-Qualified Stock Option Award.		Form 10-K (Exhibit 10.3.2)	3/25/2015	001-33133
10.2.3†	2014 Stock Option and Incentive Plan, Form of Restricted Stock Unit Award.		Form 10-K (Exhibit 10.3.3)	3/25/2015	001-33133
10.3†	Amended and Restated 2018 Stock Option and Incentive Plan.		Form 8-K (Exhibit 10.1)	5/30/2023	001-33133
10.3.1†	Amended and Restated 2018 Stock Option and Incentive Plan, Form of Stock Option Agreement.		Form 10-K (Exhibit 10.2.5)	3/28/2019	001-33133
10.3.2†	2018 Stock Option and Incentive Plan, Form of Restricted Stock Unit Agreement.		Form 10-K (Exhibit 10.2.6)	3/25/2020	001-33133
10.4†	Employment Agreement between the Company and Oliver P. Peoples dated March 28, 2017.		Form 10-K (Exhibit 10.3)	3/30/2017	001-33133
10.5†	Employment Agreement between the Company and Charles B. Haaser dated March 28, 2017.		Form 10-K (Exhibit 10.4)	3/30/2017	001-33133
10.6†	Employment Agreement between the Company and Lynne H. Brum dated March 28, 2017.		Form 10-K (Exhibit 10.6)	3/30/2017	001-33133

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
10.7†	Employment Agreement between the Company and Kristi Snell dated March 28, 2017.		Form 10-K (Exhibit 10.8)	3/30/2017	001-33133
10.8†	Form of Employee Noncompetition, Confidentiality and Inventions Agreement between the Company and its Employee.		Form 10-K (Exhibit 10.9)	3/30/2017	001-33133
10.9†	Form of Indemnification Agreement between the Registrant and its Directors and Officers.		Form S/1/A (Exhibit 10.14)	10/20/2006	333-135760
10.10	Standstill Agreement dated June 19, 2015 between the Company and Jack W. Schuler, Renate Schuler and the Schuler Family Foundation.		Form 8-K (Exhibit 10.1)	6/17/2015	001-33133
10.11	Lease Agreement between the Company and ARE MA Region No. 20, LLC dated January 20, 2016 for the premises located at 19 Presidential Way, Woburn, MA.		Form 8-K (Exhibit 10.1)	1/26/2016	001-33133
10.12	Sublease between CJ Research Center LLC and the Company, dated as of September 16, 2016.		Form 10-K (Exhibit 10.20)	3/30/2017	001-33133
10.13	Form of Securities Purchase Agreement dated July 3, 2017 between the Company and the Purchasers named therein.		Form 8-K (Exhibit 10.1)	7/5/2017	001-33133
10.14@	Exclusive License Agreement, dated May 17, 2018, between the Company and the University of Missouri.		Form 10-Q (Exhibit 10.2)	8/9/2018	001-33133
10.15	Form of Securities Purchase Agreement dated March 14, 2019 between the Company and the Investors named therein.		Form 8-K (Exhibit 10.1)	3/15/2019	001-33133
10.16	Securities Purchase Agreement, dated as of November 14, 2019, by and between the Company and the Investors listed on Schedule I thereto.		Form 8-K (Exhibit 10.1)	11/20/2019	001-33133

Exhibit Number	Exhibit Description	Filed Herewith	Incorporated by Reference herein from Form or Schedule	Filing Date	SEC File/Reg. Number
10.17	Securities Purchase Agreement, dated as of August 22, 2020, by and between the Company and the Investors listed on Schedule I thereto.		Form 8-K (Exhibit 10.1)	8/25/2020	001-33133
10.18@	Collaboration and Option Agreement, dated November 12, 2020, by and between the Company and Rothamsted Research Institute, as amended.		Form 10-K (Exhibit 10.18)	3/14/2023	001-33133
10.19	Securities Purchase Agreement, dated as of April 28, 2023, between the Company and MPC Investment LLC.		Form 8-K (Exhibit 10.1)	5/1/2023	001-33133
10.20	Securities Purchase Agreement, dated as of May 3, 2023, by and between the Company and the Purchasers.		Form 8-K (Exhibit 10.1)	5/4/2023	001-33133
21.1	Subsidiaries of the Registrant.		Form 10-K (Exhibit 21.1)	3/16/2021	001-33133
23.1	Consent of RSM US LLP, an independent registered public accounting firm.	X			
23.2	Consent of Covington & Burling LLP (included in Exhibit 5.1).				
24.1	Power of Attorney (included in the signature pages to the registration statement).				
101.INS	XBRL Instance Document.		Form 10-K (Exhibit 101.INS)	3/14/2023	001-33133
101.SCH	XBRL Taxonomy Extension Schema.		Form 10-K (Exhibit 101.SCH)	3/14/2023	001-33133
101.CAL	XBRL Taxonomy Extension Calculation Linkbase.		Form 10-K (Exhibit 101.CAL)	3/14/2023	001-33133
101.DEF	XBRL Taxonomy Extension Definition Linkbase.		Form 10-K (Exhibit 101.DEF)	3/14/2023	001-33133
101.LAB	XBRL Taxonomy Extension Label Linkbase.		Form 10-K (Exhibit 101.LAB)	3/14/2023	001-33133
101.PRE	XBRL Taxonomy Extension Presentation Linkbase.		Form 10-K (Exhibit 101.PRE)	3/14/2023	001-33133
107	Filing fee table.	X			

† Management contract or compensatory plan or arrangement.

@ Certain confidential information contained in this exhibit, marked by brackets, has been omitted pursuant to Item 601(b)(10)(iv) because the information (i) is not material and (ii) is the type of information that the Company both customarily and actually treats as private and confidential.

* To be filed by amendment.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement.

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

provided, however, that paragraphs (i), (ii) and (iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the SEC by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is part of the registration statement.

(2) That, for the purpose of determining any liability under the Securities Act, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser: each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on Rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in the registration statement as of the date it is first used after effectiveness; provided, however, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are

offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

- (i) any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;
- (ii) any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;
- (iii) the portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and
- (iv) any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(6) Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers, and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

(7) (A) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b) (1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(B) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Woburn, Massachusetts, on July 13, 2023.

YIELD10 BIOSCIENCE, INC.

By: /s/ Oliver P. Peoples
 Oliver P. Peoples
 President and Chief Executive Officer

POWER OF ATTORNEY

We, the undersigned officers and directors of Yield10 Bioscience, Inc., hereby severally constitute and appoint Oliver P. Peoples, Charles B. Haaser, and Lynne H. Brum, and each of them singly, our true and lawful attorneys, with full power to them, and to each of them singly, to sign for us and in our names in the capacities indicated below, the registration statement on Form S-1 filed herewith, and any and all pre-effective and post-effective amendments to said registration statement, and any registration statement filed pursuant to Rule 462(b) under the Securities Act, in connection with the registration under the Securities Act of equity securities of the Company, and to file or cause to be filed the same, with all exhibits thereto and other documents in connection therewith, with the SEC, granting unto said attorneys, and each of them, full power and authority to do and perform each and every act and thing requisite and necessary to be done in connection therewith, as fully to all intents and purposes as each of us might or could do in person, and hereby ratifying and confirming all that said attorneys, and each of them, or their substitute or substitutes, shall do or cause to be done by virtue of this Power of Attorney.

Pursuant to the requirements of the Securities Act, this registration statement on Form S-1 has been signed by the following persons in the capacities and on the dates indicated:

<u>/s/ Oliver P. Peoples</u> Oliver P. Peoples	President, Chief Executive Officer and Director (Principal Executive Officer)	July 13, 2023
<u>/s/ Charles B. Haaser</u> Charles B. Haaser	Vice President, Finance, and Chief Accounting Officer (Principal Financial and Accounting Officer)	July 13, 2023
<u>/s/ Sherri M. Brown</u> Sherri M. Brown	Director	July 13, 2023
<u>/s/ Richard W. Hamilton</u> Richard W. Hamilton	Director	July 13, 2023
<u>/s/ Willie Loh</u> Willie Loh	Director	July 13, 2023
<u>/s/ Anthony J. Sinskey</u> Anthony J. Sinskey	Director	July 13, 2023
<u>/s/ Robert L. Van Nostrand</u> Robert L. Van Nostrand	Chairman	July 13, 2023

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in this Registration Statement on Form S-1 and related Prospectus of Yield10 Bioscience, Inc. of our report dated March 14, 2023, relating to the consolidated financial statements of Yield10 Bioscience, Inc., appearing in the Annual Report on Form 10-K of Yield10 Bioscience, Inc. for the year ended December 31, 2022.

We also consent to the reference to our firm under the heading "Experts" in such Prospectus.

/s/ RSM US LLP

Boston, Massachusetts
July 13, 2023

Calculation of Filing Fee Tables

Form S-1
(Form Type)Yield10 Bioscience, Inc.
(Exact Name of Registrant as Specified in its Charter)**Table 1: Newly Registered and Carry-Forward Securities**

	Security Type	Security Class Title	Fee Calculation Rule	Amount Registered (1)	Proposed Maximum Offering Price Per Unit	Maximum Aggregate Offering Price (2)	Fee Rate	Amount of Registration Fee	Carry Forward Form Type	Carry Forward File Number	Carry Forward Initial Effective Date	Filing Fee Previously Paid In Connection with Unsold Securities to be Carried Forward
Newly Registered Securities												
Fees to be Paid	Equity	Common stock, par value \$0.01 per share ("Common Stock")	457(o)			\$12,000,000	0.00011020	\$1,322.40				
	Other	Pre-funded warrants to purchase shares of Common Stock(3)	N/A									
	Equity	Common Stock underlying the Pre-funded warrants to purchase Common Stock(3)	N/A									
Fees Previously Paid	N/A	N/A	N/A	N/A	N/A	N/A		N/A				
Carry Forward Securities												
Carry Forward Securities	N/A	N/A	N/A	N/A		N/A			N/A	N/A	N/A	N/A
	Total Offering Amount					\$12,000,000	0.00011020	\$1,322.40				
	Total Fees Previously Paid							N/A				
	Total Fee Offsets							N/A				
	Net Fee Due							\$1,322.40				

(1) Pursuant to Rule 416(a) promulgated under the Securities Act of 1933, as amended, this Registration Statement shall also cover any additional shares of common stock of Yield10 Bioscience, Inc. (the "Registrant") that become issuable with respect to the securities identified in the above table by reason of any stock dividend, stock split, recapitalization or other transaction effected without the Registrant's receipt of consideration that results in an increase in the number of outstanding shares of Registrant's common stock.

(2) Estimated solely for the purpose of calculating the amount of the registration fee in pursuant to Rule 457(o) under the Securities Act of 1933, as amended (the "Securities Act")

(3) In accordance with Rule 457(g), the entire registration fee for the Pre-funded Warrants is allocated to the shares of Common Stock underlying such Pre-funded Warrants, and no separate fee is payable for the Pre-funded Warrants.