UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934.**

For the quarterly period ended September 30, 2022

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from to

Commission file number 001-33133

YIELD10 BIOSCIENCE, INC.

Delaware	**04-3158289**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
19 Presidential Way Woburn, MA	**01801**
(Address of principal executive offices)	(Zip Code)

(617) 583-1700
(Registrant's telephone number, including area code)

(Former name, former address and former fiscal year, if changed since last report.)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock	YTEN	The Nasdaq Capital Market

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No o

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No o

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a 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	o	Accelerated filer	o
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	o

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 13(a) of the Exchange Act. o

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes o No ☒

The number of shares outstanding of the registrant's common stock as of November 10, 2022 was 4,944,202.

Yield10 Bioscience, Inc.
Form 10-Q
For the Quarter Ended September 30, 2022

Table of Contents

		Page
Part I. Financial Information		
Item		
1.	Condensed Consolidated Financial Statements (unaudited)	
	Condensed Consolidated Balance Sheets at September 30, 2022 and December 31, 2021	3
	Condensed Consolidated Statements of Operations for the three and nine months ended September 30, 2022 and 2021	4
	Condensed Consolidated Statements of Comprehensive Loss for the three and nine months ended September 30, 2022 and 2021	5
	Condensed Consolidated Statements of Cash Flows for the nine months ended September 30, 2022 and 2021	6
	Condensed Consolidated Statements of Stockholders' Equity for the three and nine months ended September 30, 2022 and 2021	7
	Notes to the Condensed Consolidated Financial Statements	9
2.	Management’s Discussion and Analysis of Financial Condition and Results of Operations	21
3.	Quantitative and Qualitative Disclosures About Market Risk	28
4.	Controls and Procedures	28
Part II. Other Information		28
Item		
1.	Legal Proceedings	28
1A.	Risk Factors	28
2.	Unregistered Sales of Equity Securities and Use of Proceeds	29
3.	Defaults Upon Senior Securities	29
4.	Mine Safety Disclosures	29
5.	Other Information	28
6.	Exhibits	29
SIGNATURES		30

PART I. FINANCIAL INFORMATION

ITEM 1. CONDENSED CONSOLIDATED FINANCIAL STATEMENTS

YIELD10 BIOSCIENCE, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
UNAUDITED

(in thousands, except share and per share data)

	September 30, 2022	December 31, 2021
Assets		
Current Assets:		
Cash and cash equivalents	$ 3,922	$ 5,329
Short-term investments	3,483	10,661
Accounts receivable	37	164
Unbilled receivables	39	34
Prepaid expenses and other current assets	414	436
Total current assets	7,895	16,624
Restricted cash	264	264
Property and equipment, net	840	890
Right-of-use assets	2,063	2,354
Other assets	210	283
Total assets	$ 11,272	$ 20,415
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable	$ 104	$ 83
Accrued expenses	1,163	1,136
Current portion of lease liabilities	559	514
Total current liabilities	1,826	1,733
Lease liabilities, net of current portion	2,226	2,656
Total liabilities	4,052	4,389
Commitments and contingencies (Note 9)		
Stockholders' Equity:		
Preferred stock ($0.01 par value per share); 5,000,000 shares authorized; no shares issued or outstanding	—	—
Common stock ($0.01 par value per share); 60,000,000 shares authorized at September 30, 2022 and December 31, 2021; 4,933,288 and 4,881,851 shares issued and outstanding at September 30, 2022 and December 31, 2021, respectively	49	49
Additional paid-in capital	403,799	402,283
Accumulated other comprehensive loss	(234)	(175)
Accumulated deficit	(396,394)	(386,131)
Total stockholders' equity	7,220	16,026
Total liabilities and stockholders' equity	$ 11,272	$ 20,415

The accompanying notes are an integral part of these interim unaudited condensed consolidated financial statements

YIELD10 BIOSCIENCE, INC.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
UNAUDITED
(in thousands, except share and per share data)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	**2021**	**2022**	**2021**
Revenue:				
Grant revenue	$ 111	$ 92	$ 363	$ 462
Total revenue	111	92	363	462
Expenses:				
Research and development	2,083	1,636	5,862	4,603
General and administrative	1,518	1,547	4,748	4,583
Total expenses	3,601	3,183	10,610	9,186
Loss from operations	(3,490)	(3,091)	(10,247)	(8,724)
Other income (expense):				
Gain on investment in related party	—	700	—	700
Other income (expense), net	10	(1)	11	(2)
Total other income (expense)	10	699	11	698
Loss from operations before income taxes	(3,480)	(2,392)	(10,236)	(8,026)
Income tax provision	(9)	(6)	(27)	(25)
Net loss	$ (3,489)	$ (2,398)	$ (10,263)	$ (8,051)
Basic and diluted net loss per share	$ (0.71)	$ (0.49)	$ (2.09)	$ (1.72)
Number of shares used in per share calculations:				
Basic and diluted	4,924,606	4,873,248	4,904,737	4,681,292

The accompanying notes are an integral part of these interim unaudited condensed consolidated financial statements

YIELD10 BIOSCIENCE, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
UNAUDITED
(in thousands)

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	**2021**	**2022**	**2021**
Net loss:	$ (3,489)	$ (2,398)	$ (10,263)	$ (8,051)
Other comprehensive loss				
Change in unrealized loss on investments	20	—	(2)	1
Change in foreign currency translation adjustment, net of income tax	(34)	(17)	(57)	(12)
Total other comprehensive loss	(14)	(17)	(59)	(11)
Comprehensive loss	$ (3,503)	$ (2,415)	$ (10,322)	$ (8,062)

The accompanying notes are an integral part of these interim unaudited condensed consolidated financial statements

YIELD10 BIOSCIENCE, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
UNAUDITED
(in thousands)

	Nine Months Ended September 30,	
	2022	**2021**
Cash flows from operating activities		
Net loss	$ (10,263)	$ (8,051)
Adjustments to reconcile net loss to cash used in operating activities:		
Depreciation and amortization	197	165
Charge for 401(k) company common stock match	111	100
Stock-based compensation	1,458	1,175
Non-cash lease expense	291	265
Deferred income tax provision	37	24
Changes in operating assets and liabilities:		
Accounts receivable	127	62
Unbilled receivables	(5)	(19)
Prepaid expenses and other assets	52	60
Accounts payable	21	(15)
Accrued expenses	17	(192)
Lease liabilities	(385)	(342)
Net cash used in operating activities	(8,342)	(6,768)
Cash flows from investing activities		
Purchase of property and equipment	(154)	(147)
Purchase of investments	(1,195)	(3,874)
Proceeds from the maturity of short-term investments	8,371	6,250
Net cash provided by investing activities	7,022	2,229
Cash flows from financing activities		
Proceeds from warrants exercised	—	3,856
Proceeds from public offering, net of issuance costs	—	11,993
Taxes paid on employees' behalf related to vesting of stock awards	(37)	(103)
Net cash (used in) provided by financing activities	(37)	15,746
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(50)	(12)
Net (decrease) increase in cash, cash equivalents and restricted cash	(1,407)	11,195
Cash, cash equivalents and restricted cash at beginning of period	5,593	3,687
Cash, cash equivalents and restricted cash at end of period	$ 4,186	$ 14,882

The accompanying notes are an integral part of these interim unaudited condensed consolidated financial statements

YIELD10 BIOSCIENCE, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
UNAUDITED
(In thousands, except share amounts)

	Three Months Ended September 30, 2022					
	Common Stock					
	Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
Balance, June 30, 2022	4,901,246	$ 49	$ 403,347	$ (220)	$ (392,905)	$ 10,271
Stock-based compensation expense	—	—	446	—	—	446
Issuance of common stock for 401(k) match	12,875	—	29	—	—	29
Issuance of common stock for restricted stock units	19,167	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	(23)	—	—	(23)
Effect of foreign currency translation and unrealized loss on investments	—	—	—	(14)	—	(14)
Net loss	—	—	—	—	(3,489)	(3,489)
Balance, September 30, 2022	4,933,288	$ 49	$ 403,799	$ (234)	$ (396,394)	$ 7,220

	Three Months Ended September 30, 2021					
	Common Stock					
	Shares	Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
Balance, June 30, 2021	4,868,466	$ 49	$ 401,319	$ (153)	$ (380,753)	$ 20,462
Stock-based compensation expense	—	—	436	—	—	436
Issuance of common stock for 401(k) match	2,857	—	24	—	—	24
Issuance of common stock for restricted stock units	6,664	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	(19)	—	—	(19)
Effect of foreign currency translation and unrealized loss on investments	—	—	—	(17)	—	(17)
Net loss	—	—	—	—	(2,398)	(2,398)
Balance, September 30, 2021	4,877,987	$ 49	$ 401,760	$ (170)	$ (383,151)	$ 18,488

Nine Months Ended September 30, 2022	Common Stock Shares	Common Stock Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
Balance, December 31, 2021	4,881,851	$ 49	$ 402,283	$ (175)	$ (386,131)	$ 16,026
Stock-based compensation expense	—	—	1,458	—	—	1,458
Issuance of common stock for 401(k) match	25,792	—	95	—	—	95
Issuance of common stock for restricted stock units	25,645	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	(37)	—	—	(37)
Effect of foreign currency translation and unrealized loss on investments	—	—	—	(59)	—	(59)
Net loss	—	—	—	—	(10,263)	(10,263)
Balance, September 30, 2022	4,933,288	$ 49	$ 403,799	$ (234)	$ (396,394)	$ 7,220

Nine Months Ended September 30, 2021	Common Stock Shares	Common Stock Par Value	Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
Balance, December 31, 2020	3,334,048	$ 33	$ 384,758	$ (159)	$ (375,100)	$ 9,532
Stock-based compensation expense	—	—	1,185	—	—	1,185
Issuance of common stock for 401(k) match	9,747	—	86	—	—	86
Issuance of common stock for warrant exercises	481,973	5	3,851	—	—	3,856
Issuance of common stock for restricted stock units	12,219	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	(102)	—	—	(102)
Issuance of common stock in connection with stock offering, net of offering costs	1,040,000	11	11,982	—	—	11,993
Effect of foreign currency translation and unrealized loss on investments	—	—	—	(11)	—	(11)
Net loss	—	—	—	—	(8,051)	(8,051)
Balance, September 30, 2021	4,877,987	$ 49	$ 401,760	$ (170)	$ (383,151)	$ 18,488

The accompanying notes are an integral part of these interim unaudited condensed consolidated financial statements

YIELD10 BIOSCIENCE, INC.
NOTES TO THE CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
UNAUDITED

(Amounts in thousands, except share and per share amounts)

1. NATURE OF BUSINESS AND BASIS OF PRESENTATION

Yield10 Bioscience, Inc. ("Yield10" or the "Company") is an agricultural bioscience company that is developing the oilseed Camelina sativa ("Camelina") as a platform crop for large scale production of low carbon sustainable seed products to address:

- petroleum replacement markets, in which the Company is developing Camelina oil for use as a biofuel feedstock and PHA Bioplastics produced in Camelina seed for use as a biodegradable bioplastic; and
- food and nutrition markets, in which the Company is developing omega-3 (EPA, DHA+EPA) oils produced in Camelina seed for aquaculture, nutraceuticals and protein meal for animal feed markets.

Yield10 also plans to license yield and seed oil traits from the Company's pipeline to large seed companies for commercialization in major food crops, including corn, soybean and canola. Yield10 is headquartered in Woburn, Massachusetts, and has an Oilseed Center of Excellence located in Saskatoon, Saskatchewan, Canada. Yield10's wholly-owned Canadian subsidiary, Metabolix Oilseeds Inc., changed its name to Yield10 Oilseeds Inc. ("YOI") effective July 12, 2022, in order to better align the name with the Company's branding.

The accompanying condensed consolidated financial statements are presented in U.S. dollars, are unaudited, and have been prepared by Yield10 in accordance with accounting principles generally accepted in the United States of America ("GAAP") and pursuant to the rules and regulations of the U.S. Securities and Exchange Commission ("SEC"). Certain information and footnote disclosures normally included in the Company's annual consolidated financial statements have been condensed or omitted. The year-end condensed consolidated balance sheet data was derived from audited financial statements but does not include all disclosures required by GAAP. The condensed consolidated financial statements, in the opinion of management, reflect all adjustments (consisting only of normal recurring adjustments) necessary for fair statement of the financial position as of September 30, 2022 and December 31, 2021, and for the results of operations for the interim periods ended September 30, 2022 and September 30, 2021.

The results of operations for the interim periods are not necessarily indicative of the results of operations to be expected for any future period or the entire fiscal year. These interim unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements for the year ended December 31, 2021, which are contained in the Company's Annual Report on Form 10-K filed with the SEC on March 25, 2022.

The accompanying condensed consolidated financial statements have been prepared on a basis which assumes that the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the normal course of business. With the exception of a single year, the Company has recorded losses since its initial founding, including the three and nine months ended September 30, 2022.

As of September 30, 2022, the Company held unrestricted cash, cash equivalents and investments of $7,405. The Company follows the guidance of Accounting Standards Codification ("ASC") Topic 205-40, *Presentation of Financial Statements-Going Concern*, in order to determine whether there is substantial doubt about its ability to continue as a going concern for one year after the date its condensed consolidated financial statements are issued. The Company's ability to continue operations after its current cash resources are exhausted depends on its ability to obtain additional financing through, among other sources, public or private equity financing, secured or unsecured debt financing, equity or debt bridge financing, warrant holders' ability and willingness to exercise the Company's outstanding warrants, additional research grants or collaborative arrangements with third parties, as to which no assurance can be given. Management does not know whether additional financing will be available on terms favorable or acceptable to the Company when needed, if at all. If adequate additional funds are not available when required, management will be forced to curtail the Company's research efforts, explore strategic alternatives and/or wind down the Company's operations and pursue options for liquidating its remaining assets, including intellectual property and equipment. Based on the Company's current cash forecast, management has determined that the Company's present capital resources will not be sufficient to fund its planned operations for at least one year from when these condensed consolidated financial statements are available to be issued, which raises substantial doubt as to the Company's ability to continue as a going concern. This forecast of cash resource is forward-looking information that involves risks and uncertainties, and the actual amount of expenses could vary materially and adversely as a result of a number of factors.

If the Company issues equity or debt securities to raise additional funds in the future, (i) the Company may incur fees associated with such issuance, (ii) its existing stockholders may experience dilution from the issuance of new equity securities, (iii) the Company may incur ongoing interest expense and be required to grant a security interest in Company assets in connection with any debt issuance, and (iv) the new equity or debt securities may have rights, preferences and privileges senior to those of the Company’s existing stockholders. In addition, utilization of the Company’s net operating loss and research and development credit carryforwards may be subject to significant annual limitations under Section 382 of the Internal Revenue Code due to ownership changes resulting from equity financing transactions. If the Company raises additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to its potential products or proprietary technologies or grant licenses on terms that are not favorable to the Company.

In February 2022, Russia initiated a military offensive in Ukraine which has resulted in significant uncertainty in the commodities market. The scope, intensity, duration and outcome of the ongoing war, resulting sanctions and resulting future market disruptions is uncertain and its continuation or escalation may have a material adverse effect on the Company. Ukraine, and the Black Sea region in general, are a major exporter of wheat and corn to the world, and the disruption of supply could cause volatility in prices and margins of these commodities and related products. Ukraine is also the largest supplier of sun seed and sun oil in the world which cannot be completely replaced from other geographic regions. The conflict in Ukraine has created disruptions in global supply chains and is expected to create dislocations of key agricultural commodities. While Yield10 has no direct business operations or assets within either Ukraine or Russia, the Company's plans and operating results could be adversely affected by a number of factors, including the crop growing decisions made by farmers in the U.S., Canada and South America as a consequence of supply shortages and rising commodity prices. These rising prices may negatively impact the Company's ability to contract suitable acreage for future crop trials or could delay its plans to commercialize Yield10's first Camelina plant varieties.

The Company’s results of operations could be adversely affected by general conditions in the global economy and in the global financial markets, including changes in inflation, interest rates and overall economic conditions and uncertainties. For instance, for the twelve months ended September 30, 2022, the U.S. Bureau of Labor Statistics reported that the Consumer Price Index for All Urban Consumers increased 8.2 percent. If the inflation rate continues to increase, for example due to increases in the costs of labor and supplies, it will affect the Company's expenses and it might make it more expensive for the Company to continue its research and development. Inflation could also adversely affect the ability of growers to enter into and fulfill their obligations under Camelina grain production agreements with the Company.

The full impact of the COVID-19 pandemic continues to evolve as of the date of this report. As such, the full magnitude that the pandemic will have on the Company's financial condition, liquidity and future results of operations is uncertain. While management currently expects the impact of COVID-19 to be temporary, there is uncertainty around the duration and its broader impact on the economy and therefore the effects it will have on Yield10's financial condition, liquidity, operations, suppliers, industry, and workforce. Given the evolving nature of the COVID-19 pandemic and the global responses to it, the Company is not able to estimate the effects of the COVID-19 pandemic on its results of operations, financial condition, or liquidity for future periods.

2. ACCOUNTING POLICIES

Basis of Presentation and Principles of Consolidation

The accompanying unaudited condensed consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America, including accounting standards set by the Financial Accounting Standards Board ("FASB"). The FASB sets GAAP that the Company follows to ensure its financial condition, results of operations, and cash flows are consistently reported. References to GAAP issued by the FASB in these notes to the unaudited condensed consolidated financial statements are to the ASC. The unaudited condensed consolidated financial statements include the accounts of the Company and its wholly owned subsidiaries. All intercompany transactions were eliminated, including transactions with its subsidiaries, YOI and Yield10 Bioscience Securities Corp.

Cash, Cash Equivalents and Restricted Cash

The Company considers all highly liquid investments purchased with an original maturity date of ninety days or less at the date of purchase to be cash equivalents.

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the Company's unaudited condensed consolidated balance sheets included herein:

		September 30, 2022		December 31, 2021
Cash and cash equivalents	$	3,922	$	5,329
Restricted cash		264		264
Total cash, cash equivalents and restricted cash	$	4,186	$	5,593

Amounts included in restricted cash represent those required to be set aside by contractual agreement. Restricted cash of $264 at September 30, 2022 and December 31, 2021 consists primarily of funds held in connection with the Company's lease agreement for its Woburn, Massachusetts facility.

Investments

The Company classifies investments purchased with an original maturity date of more than ninety days at the date of purchase and a maturity date of one year or less at the balance sheet date to be short-term investments. The Company classifies investments with a maturity date of greater than one year from the balance sheet date as long-term investments.

Other-than-temporary impairments of equity investments are recognized in the Company's unaudited condensed consolidated statements of operations if the Company has experienced a credit loss and has the intent to sell the investment or if it is more likely than not that the Company will be required to sell the investment before recovery of the amortized cost basis. Realized gains and losses, dividends, interest income and declines in value judged to be other-than-temporary credit losses are included in other income (expense). Any premium or discount arising at purchase is amortized and/or accreted to interest income.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of grant revenue and expenses during the reporting periods. Actual results could differ from those estimates.

Foreign Currency Translation

The functional currency for YOI is the Canadian dollar. Foreign denominated assets and liabilities of YOI are translated into U.S. dollars at the prevailing exchange rates in effect on the balance sheet date. Revenues and expenses are translated at average exchange rates prevailing during the period. Any resulting translation gains or losses are recorded in accumulated other comprehensive income (loss) in the unaudited condensed consolidated balance sheet. When the Company dissolves, sells all or substantially all of the assets of a consolidated foreign subsidiary, the cumulative translation gain or loss of that subsidiary is released from comprehensive income (loss) and included within its unaudited condensed consolidated statement of operations during the fiscal period when the dissolution or sale occurs.

Comprehensive Loss

Comprehensive loss is comprised of net loss and certain changes in stockholders' equity that are excluded from net loss. The Company includes unrealized gains and losses on debt securities and foreign currency translation adjustments in other comprehensive loss.

Income Taxes

The Company accounts for income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the unaudited condensed consolidated financial statements or in the Company's tax returns. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. A valuation allowance is provided to reduce deferred tax assets to a level which, more likely than not, will be realized.

The Company accounts for uncertain tax positions using a "more-likely-than-not" threshold for recognizing and resolving uncertain tax positions. The evaluation of uncertain tax positions is based on factors that include, but are not limited to, changes in tax law, the measurement of tax positions taken or expected to be taken in tax returns, the effective settlement of matters subject to audit, new audit activity and changes in facts or circumstances related to a tax position. The provision for income taxes includes the effects of any resulting tax reserves or unrecognized tax benefits that are considered appropriate as well as the related net interest and penalties, if any. The Company evaluates uncertain tax positions on a quarterly basis and adjusts the level of the liability to reflect any subsequent changes in the relevant facts surrounding the uncertain positions.

Concentration of Credit Risk

Financial instruments that potentially subject the Company to concentrations of credit risk primarily consist of cash, cash equivalents, restricted cash, short-term investments and accounts receivable. The Company has historically invested its cash in highly rated money market funds, corporate debt, federal agency notes and U.S. treasury notes. Investments, when purchased, are acquired in accordance with the Company's investment policy which establishes a concentration limit per issuer.

At September 30, 2022, all of the Company's accounts and unbilled receivables of $76 were due from Michigan State University ("MSU") for support to a Department of Energy ("DOE") funded grant under which the Company serves as a subcontractor. The Company believes these receivables have a low risk of default. At December 31, 2021, all of the Company's accounts and unbilled receivables of $198 were due from MSU for support to the DOE grant.

Fair Value Measurements

The carrying amounts of the Company's financial instruments as of September 30, 2022 and December 31, 2021, which include cash equivalents, restricted cash, accounts receivable, unbilled receivables, accounts payable, and accrued expenses, approximate their fair values due to the short-term nature of these instruments. See Note 5 for further discussion on fair value measurements.

Segment Information

The accounting guidance for segment reporting establishes standards for reporting information on operating segments in financial statements. The Company is an agricultural bioscience company operating in one segment, which is the development of improved Camelina varieties to produce proprietary products, and to produce other high value genetic traits for the agriculture and food industries. The Company's chief operating decision-maker does not manage any part of the Company separately, and the allocation of resources and assessment of performance are based on the Company's consolidated operating results.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Repairs and maintenance are charged to operating expense as incurred. Depreciation and amortization expense is computed using the straight-line method over the estimated useful lives of the assets once they are placed in service as follows:

Asset Description	Estimated Useful Life (years)
Equipment	3
Furniture and fixtures	5
Software	3
Leasehold improvements	Shorter of useful life or term of lease

Lease Accounting

As a lessee, the Company follows the lease accounting guidance codified in ASC 842. A lease is classified as a finance lease if any of five criteria described in the guidance apply to the lease and any lease not classified as a finance lease is classified as an operating lease with expense recognition occurring on a straight-line basis over the term of the lease. Under ASC 842, the Company records a lease liability on the commencement date of a lease calculated as the present value of the lease payments, using the interest rate implicit in the lease, or if that rate is not readily determinable, using the Company's incremental borrowing rate. A right-of-use asset equal to the lease liability is also recorded with adjustments made, as necessary, for lease prepayments, lease accruals, initial direct costs and lessor lease incentives that may be present within the terms of the lease. The Company adopted the short-term lease exception that permits lessees to omit leases with terms of twelve months or less from the accounting requirements of ASC 842.

Impairment of Long-Lived Assets

Long-lived assets, such as property and equipment, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be recoverable. Accounting guidance further requires that companies recognize an impairment loss only if the carrying amount of a long-lived asset is not recoverable based on its undiscounted future cash flows and measure an impairment loss as the difference between the carrying amount and fair value of the asset.

Grant Revenue

The Company's source of continuing revenue is from its government research grants, in which it serves as either the primary contractor or as a subcontractor. These grants are considered a central operation of the Company's business. Revenue is earned as research expenses related to the grants are incurred. Revenue earned on government grants, but not yet invoiced as of the balance sheet date, are recorded as unbilled receivables in the accompanying unaudited condensed consolidated balance sheets at September 30, 2022 and December 31, 2021. Funds received from government grants in advance of work being performed, if any, are recorded as deferred revenue until earned.

Research and Development

All costs associated with internal research and development are expensed as incurred. Research and development expenses include, among others, direct costs for salaries, employee benefits, subcontractors, crop trials, regulatory activities, facility related expenses, depreciation, and stock-based compensation. Costs incurred for seed multiplication and processing are included within research and development expense until the Company completes its transition to established commercial operations, at which time these costs are expected to be recorded within inventory. Costs incurred in connection with government research grants are recorded as research and development expense.

General and Administrative Expenses

The Company's general and administrative expense includes costs for salaries, employee benefits, facilities expenses, consulting and professional service fees, travel expenses, depreciation, stock-based compensation and office related expenses incurred to support the administrative and business development of the Company.

Intellectual Property Costs

The Company includes all costs associated with the prosecution and maintenance of patents within general and administrative expenses in the Company's unaudited condensed consolidated statements of operations.

Stock-Based Compensation

All share-based payments to employees, members of the Board of Directors and non-employees are recognized within operating expenses based on the straight-line recognition of their grant date fair value over the period during which the recipient is required to provide service in exchange for the award. See Note 7 for a description of the types of stock-based awards granted, the compensation expense related to such awards and detail of equity-based awards outstanding.

Recent Accounting Standards

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies that the Company adopts as of the specified effective date.

In November 2021, the FASB issued ASU 2021-10, *Government Assistance (Topic 832) - Disclosures by Business Entities about Government Assistance*. This ASU requires annual disclosures that are expected to increase the transparency of transactions with a government accounted for by applying a grant or contribution accounting model by analogy, including (1) the nature of the transactions and the form in which assistance has been received, (2) the accounting policy applied, and (3) the balance sheet and income statement line items that are affected by the transactions, and the amounts applicable to each financial statement line item. This ASU is effective for annual periods beginning after December 15, 2021. The adoption of this standard has not materially impacted the Company’s condensed consolidated financial statements in 2022.

The following new pronouncement is not yet effective but may impact the Company's unaudited condensed consolidated financial statements in the future.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments-Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments.* The FASB subsequently issued amendments to ASU 2016-13, which have the same effective date and transition date as the initial pronouncement. This standard requires entities to estimate an expected lifetime credit loss on financial assets ranging from short-term trade accounts receivable to long-term financings and report credit losses using an expected losses model rather than the incurred losses model that was previously used, and establishes additional disclosures related to credit risks. For available-for-sale debt securities with unrealized losses, this standard now requires allowances to be recorded instead of reducing the amortized cost of the investment. This standard limits the amount of credit losses to be recognized for available-for-sale debt securities to the amount by which carrying value exceeds fair value and requires the reversal of previously recognized credit losses if fair value increases. The guidance is effective for fiscal years beginning after December 15, 2022 for SEC filers that are eligible to be smaller reporting companies under the SEC's definition, and interim periods within those fiscal years. The Company is currently evaluating the impact this guidance will have on its unaudited condensed consolidated financial statements.

3. BASIC AND DILUTED NET LOSS PER SHARE

Basic net loss per share is computed by dividing net loss available to common shareholders by the weighted-average number of common shares outstanding. Diluted net loss per share is computed by dividing net loss available to common shareholders by the weighted-average number of dilutive common shares outstanding during the period. Diluted shares outstanding is calculated by adding to the weighted shares outstanding any potential (unissued) shares of common stock from outstanding stock options and warrants based on the treasury stock method, as well as weighted shares outstanding of any potential (unissued) shares of common stock from restricted stock units. In periods when a net loss is reported, all common stock equivalents are excluded from the calculation because they would have an anti-dilutive effect, meaning the loss per share would be reduced. Therefore, in periods when a loss is reported, basic and dilutive loss per share are the same. Common stock equivalents include stock options, restricted stock awards and warrants.

The following potentially dilutive securities were excluded from the calculation of diluted net loss per share due to their antidilutive effect:

	As of September 30,	
	2022	2021
Options	953,787	716,619
Restricted Stock Awards	27,123	9,430
Warrants	1,290,273	2,361,726
Total	2,271,183	3,087,775

4. INVESTMENTS

Investments consist of the following at September 30, 2022 and December 31, 2021:

	Accumulated Cost at September 30, 2022	Unrealized Gain	Unrealized (Loss)	Market Value at September 30, 2022
Short-term investments				
U.S. government and agency securities	$ 3,493	$ —	$ (10)	$ 3,483
Total	$ 3,493	$ —	$ (10)	$ 3,483

	Accumulated Cost at December 31, 2021	Unrealized Gain	Unrealized (Loss)	Market Value at December 31, 2021
Short-term investments				
U.S. government and agency securities	$ 10,669	$ —	$ (8)	$ 10,661
Total	$ 10,669	$ —	$ (8)	$ 10,661

All investments are classified as available for sale as of September 30, 2022 and December 31, 2021.

5. FAIR VALUE MEASUREMENTS

The Company has certain financial assets recorded at fair value which have been classified as Level 1 and Level 2 within the fair value hierarchy as described in the accounting standards for fair value measurements. Fair value is the price that would be received from the sale of an asset or the price paid to transfer a liability in an orderly transaction between independent market participants at the measurement date. Fair values determined by Level 1 inputs utilize observable data such as quoted prices in active markets for identical instruments. Fair values determined by Level 2 inputs utilize data points other than quoted prices in active markets that are observable either directly or indirectly. Fair values determined by Level 3 inputs utilize unobservable data points in which there is little or no market data, which require the reporting entity to develop its own assumptions. The fair value hierarchy level is determined by the lowest level of significant input.

The Company's financial assets classified as Level 2 at September 30, 2022 and December 31, 2021 were initially valued at the transaction price and subsequently valued utilizing third-party pricing services. Because the Company's investment portfolio may include securities that do not always trade on a daily basis, the pricing services use many observable market inputs to determine value including reportable trades, benchmark yields and benchmarking of like securities. The Company validates the prices provided by the third-party pricing services by reviewing their pricing methods and obtaining market values from other pricing sources. After completing the validation procedures, the Company did not adjust or override any fair value measurements provided by these pricing services as of September 30, 2022 and December 31, 2021.

The tables below present information about the Company's assets that are measured at fair value on a recurring basis as of September 30, 2022 and December 31, 2021 and indicate the fair value hierarchy of the valuation techniques utilized to determine such fair value.

	Fair value measurements at reporting date using			
Description	**Quoted prices in active markets for identical assets (Level 1)**	**Significant other observable inputs (Level 2)**	**Significant unobservable inputs (Level 3)**	**Balance as of September 30, 2022**
Cash equivalents:				
Money market funds	$ 2,594	$ —	$ —	$ 2,594
Short-term investments:				
U.S. government and agency securities	—	3,483	—	3,483
Total assets	$ 2,594	$ 3,483	$ —	$ 6,077

	Fair value measurements at reporting date using			
Description	**Quoted prices in active markets for identical assets (Level 1)**	**Significant other observable inputs (Level 2)**	**Significant unobservable inputs (Level 3)**	**Balance as of December 31, 2021**
Cash equivalents:				
Money market funds	$ 4,878	$ —	$ —	$ 4,878
Short-term investments:				
U.S. government and agency securities	—	10,661	—	10,661
Total assets	$ 4,878	$ 10,661	$ —	$ 15,539

There were no transfers of financial assets between category levels during the three and nine months ended September 30, 2022 and the three and nine months ended September 30, 2021.

6. ACCRUED EXPENSES

Accrued expenses consisted of the following at:

	September 30, 2022	December 31, 2021
Employee compensation and benefits	$ 386	$ 452
Leased facilities	61	71
Professional services	237	264
Field trials and related expenses	342	97
Other	137	252
Total accrued expenses	$ 1,163	$ 1,136

7. STOCK-BASED COMPENSATION

Expense Information for Employee and Non-Employee Stock Awards

The Company recognized stock-based compensation expense related to stock awards, including awards to non-employees and members of the Board of Directors, of $447 and $1,458 for the three and nine months ended September 30, 2022, respectively, and $436 and $1,175 for the three and nine months ended September 30, 2021, respectively. At September 30, 2022, there was approximately $3,567 of unvested awards not yet recognized as compensation expense.

The compensation expense related to unvested stock awards is expected to be recognized over a remaining weighted average period of 2.58 years.

Stock Options

A summary of option activity for the nine months ended September 30, 2022 is as follows:

	Number of Shares	Weighted Average Exercise Price
Outstanding at December 31, 2021	722,765	$ 19.22
Granted	233,086	3.83
Exercised	—	—
Forfeited	(1,859)	7.55
Expired	(205)	4,816.86
Outstanding at September 30, 2022	953,787	$ 14.45
Options exercisable at September 30, 2022	377,807	$ 25.59

In accordance with the terms of the Company's 2018 Stock Option and Incentive Plan ("2018 Stock Plan"), effective January 1, 2022 and January 1, 2021, Yield10's Board of Directors approved the addition of 244,092 shares and 166,702 shares, respectively, to the 2018 Stock Plan, which represented 5% of the Company's outstanding common stock on the day prior to each increase. At its annual meeting of stockholders on May 24, 2021, stockholders approved an amendment to the 2018 Stock Plan to add 300,000 more shares to the plan. As of September 30, 2022, 25,961 shares remain available to be awarded from the 2018 Stock Plan.

Restricted Stock Units

The Company records stock compensation expense for restricted stock units ("RSUs") on a straight-line basis over their requisite service period, which approximates the vesting period, based on each RSU's award date fair market value. As RSUs vest, the Company withholds a number of shares from its employees with an aggregate fair market value equal to the minimum tax withholding amount from the common stock issuable at the vest date. During the nine months ended September 30, 2022, 36,557 employee RSUs vested, of which 10,912 common shares with a total market value of $34 were withheld to pay employee tax withholding.

A summary of RSU activity for the nine months ended September 30, 2022 is as follows:

	Number of RSUs	Weighted Average Remaining Contractual Life (years)
Outstanding at December 31, 2021	9,430	
Awarded	54,250	
Released	(36,557)	
Outstanding at September 30, 2022	27,123	0.36

8. LEASES

Maturity Analysis of Lease Liabilities

The Company's Woburn, Massachusetts facility is the only lease included in the Company's right-of-use assets and corresponding lease liabilities. No other active real estate or equipment leases fall within the scope of ASC 842. At September 30, 2022, the Company's lease liability related to its Woburn facility will mature as follows:

Year ended December 31,		**Undiscounted Cash Flows**
2022 (October to December)	$	183
2023		749
2024		771
2025		793
2026		747
Total undiscounted future lease payments		3,243
Amount of lease payments representing interest		(460)
Total lease liabilities	$	2,783
Short-term lease liability	$	559
Long-term lease liability	$	2,224

Quantitative Disclosure of Lease Costs

	Three Months Ended September 30,				Nine Months Ended September 30,			
	2022		2021		2022		2021	
Lease cost:								
Operating lease cost	$	151	$	151	$	454	$	454
Short-term lease cost		177		171		509		497
Sublease income		(155)		(148)		(450)		(468)
Total lease cost, net	$	173	$	174	$	513	$	483

Other information as of:	**September 30, 2022**	**December 31, 2021**
Weighted-average remaining lease term (years)	4.2	4.9
Weighted-average discount rate	7.25%	7.25%

Real Estate Leases

During 2016, the Company entered into a lease agreement, as amended, for its headquarters pursuant to which the Company leases 22,213 square feet of office and research and development space located at 19 Presidential Way, Woburn, Massachusetts. The lease agreement will terminate on November 30, 2026 and does not include options for an early termination or for an extension of the lease. Pursuant to the lease, the Company is required to pay certain pro rata taxes and operating costs associated with the premises throughout the term of the lease. During the initial buildout of the rented space, the landlord paid for certain tenant improvements that resulted in increased rental payments by the Company. As required by ASC 842, these improvements were recorded as a reduction in the valuation of the associated right-of-use asset. The Company has provided the landlord with a security deposit of $229.

In October 2016, the Company entered into a sublease agreement with a subsidiary of CJ CheilJedang Corporation ("CJ") with respect to CJ's sublease of approximately 9,874 square feet of its leased facility located in Woburn, Massachusetts. The CJ sublease is coterminous with the Company's master lease and CJ will pay rent and operating expenses proportionate to the amounts payable to the landlord by the Company, as adjusted from time to time in accordance with the terms of the master lease. Future CJ sublease payments have not been presented as an offset to total undiscounted future lease payments of $3,243 shown in the lease maturity analysis table above. CJ provided the Company with a security deposit of $103 in the form of an irrevocable letter of credit.

The Company's wholly-owned subsidiary, YOI, located in Saskatoon, Saskatchewan, Canada, leases approximately 8,600 square feet of office, laboratory and greenhouse space located within Innovation Place at 410 Downey Road and within the research facility of National Research Council Canada located at 110 Gymnasium Place. None of the leases contain renewal or early termination options. YOI's leases for these facilities expire on various dates through May 2023.

9. COMMITMENTS AND CONTINGENCIES

Contractual Commitments

Exclusive Collaboration Agreement with Rothamsted Research ("Rothamsted")

In November 2020, the Company signed an exclusive collaboration agreement with UK-based Rothamsted to support Rothamsted’s program to develop omega-3 oils in Camelina sativa. Under the agreement, Yield10 is providing Rothamsted with financial support for ongoing research including further EPA, DHA+EPA trait improvement, field testing and nutritional studies. The Company is paying Rothamsted quarterly research funding and option fees of $31 for two years totaling $250, of which $31 remained outstanding as of September 30, 2022. As part of the agreement, the Company had an exclusive two-year option to sign a global, exclusive or non-exclusive license agreement to the technology. In November 2022, Yield10 and Rothamsted agreed to extend the collaboration agreement, including the license option, without additional funding support, through December 31, 2023.

License Agreement with the University of Missouri ("UM")

Pursuant to a license agreement with UM dated as of May 17, 2018, Yield10 has an exclusive, worldwide license to two novel gene technologies to boost oil content in crops. Both technologies are based on significant new discoveries around the function and regulation of ACCase, a key rate-limiting enzyme involved in oil production. The UM license was expanded during May 2019 to include an exclusive worldwide license to a third gene in the ACCase complex, that the Company has designated C3012, that may complement the activity of C3007 to boost oil content in crops.

Pursuant to the UM license agreement, the Company is required to use diligent efforts to develop licensed products throughout the licensed field and to introduce licensed products into the commercial market. The Company's failure to achieve any milestone provided for under the license agreement would give UM the right to terminate the license agreement or render it nonexclusive, unless the Company is able to reach agreement with UM as to the potential adjustment of the applicable milestone.

The Company is obligated to pay UM a license execution payment, milestone payments relating to any regulatory filings and approvals covered by the license agreement, royalties on any sales of licensed products following regulatory approval, as well as a percentage of any sublicense royalties, if any, related to the licensed products. The Company or UM may terminate the license agreement in accordance with the terms of the agreement.

Guaranteed Minimum Payments to Growers.

As an incentive for growers located in Canada and the U.S. to enter into Camelina commercial grain production contracts with the Company for the 2022/2023 winter season, Yield10 has offered minimum guaranteed payments per acre that reduce a grower's risk of financial loss. These minimum payments are conditional upon a grower fulfilling their contractual responsibilities and are reduced by the price of Yield10's Camelina planting seed and the contractual price that the Company will pay for the actual amount of grain that is harvested. Although the Company anticipates that the payment of these guaranteed amounts will not be required under normal growing conditions, for the 2022/2023 winter season the maximum amount of these grain production guarantees approximates $320.

Facility Leases

The Company leases facilities under non-cancelable leases expiring at various dates through November 30, 2026. See Note 8.

Litigation

From time to time, the Company may be subject to legal proceedings and claims in the ordinary course of business. The Company is not currently aware of any such proceedings or claims that it believes will have, individually or in the aggregate, a material adverse effect on its business, financial condition or results of operations.

Guarantees

As of September 30, 2022 and December 31, 2021, the Company did not have significant liabilities recorded for guarantees.

The Company enters into indemnification provisions under various agreements with other companies in the ordinary course of business, typically with business partners, contractors, and customers. Under these provisions, the Company generally indemnifies and holds harmless the indemnified party for losses suffered or incurred by the indemnified party as a result of its activities. These indemnification provisions generally survive termination of the underlying agreement. The maximum potential amount of future payments the Company could be required to make under these indemnification provisions is unlimited. However, to date the Company has not incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. As a result, the estimated fair value of these agreements is minimal. Accordingly, the Company has no liabilities recorded for these agreements as of September 30, 2022 and December 31, 2021.

10. LICENSE AGREEMENTS

In September 2017, the Company granted a license to Bayer to evaluate the Company's novel C3003 and C3004 yield traits in soybean. Under this license, Bayer has the non-exclusive right to begin work with C3003 in its soybean program as a strategy to improve seed yield. Bayer may also conduct research with the Company's C3004 yield trait, a trait accessible through genome editing, in combination with C3003 to evaluate the effectiveness of the combination in improving seed yield in soybean. In August 2019, the Company expanded the license with Bayer to include a new discovery related to the Company's C3004 yield trait gene.

In September 2018, the Company granted a four-year, non-exclusive license, as amended, to Forage Genetics International, LLC, a subsidiary of Land O'Lakes, Inc., to evaluate five of the Company's novel traits in forage sorghum. The traits included in the research license include C3003 as well as four traits from the Company's GRAIN platform; C4001, C4002, C4003 and C4029. In September 2022, the license terminated in accordance with its terms.

In October 2019, the Company granted a non-exclusive license to J. R. Simplot ("Simplot"), to evaluate three of the Company's novel traits in potato. Under the license agreement, Simplot plans to conduct research with the yield traits C3003, C3004 and C4001 within its research and development program as a strategy to improve crop performance and sustainability. In September 2022, the Company and Simplot amended the license agreement in order to extend it for a fourth year.

In August 2020, the Company entered into a non-exclusive research agreement with GDM ("GDM"), a company specializing in plant genetics, to evaluate novel traits in soybean. Under the terms of the agreement, GDM is working with the Company's yield traits within its research and development program as a strategy to improve soybean yield performance and sustainability. The research agreement includes three novel yield traits in the first phase with the potential to expand the program to more traits in the future.

None of these research arrangements provides significant licensing revenue to the Company while the third parties perform trait evaluations.

11. GEOGRAPHIC INFORMATION

The geographic distribution of the Company’s grant revenues and long-lived assets are summarized in the tables below. Foreign revenue is based on the country in which the Company’s subsidiary that earned the revenue is domiciled.

	U.S.	Canada	Total
Three Months Ended September 30, 2022			
Revenue	$ 111	$ —	$ 111
Three Months Ended September 30, 2021			
Revenue	$ 92	$ —	$ 92
Nine Months Ended September 30, 2022			
Revenue	$ 363	$ —	$ 363
Nine Months Ended September 30, 2021			
Revenue	$ 423	$ 39	$ 462
Identifiable long-lived assets			
September 30, 2022	$ 722	$ 118	$ 840
September 30, 2021	$ 850	$ 53	$ 903

12. CAPITAL STOCK AND WARRANTS

Common Stock

Registered Public Offerings

On February 3, 2021, the Company completed a public offering of 1,040,000 shares of its common stock at a public offering price of $12.25 per share for total gross proceeds of $12,740 before issuance costs of $747.

Preferred Stock

The Company's Certificate of Incorporation authorizes the Company to issue up to 5,000,000 shares of $0.01 par value preferred stock.

Warrants

The following table summarizes information regarding outstanding warrants to purchase common stock as of September 30, 2022:

Issuance	Number of Shares Issuable Upon Exercise of Outstanding Warrants	Exercise Price Per Share of Common Stock	Expiration Date
November 2019 Public Offering - Series B	395,528	$ 8.00	May 19, 2027
November 2019 Private Placement - Series B	718,750	$ 8.00	May 19, 2027
December 2017 Public Offering - Series A	160,975	$ 90.00	December 21, 2022
July 2017 Registered Direct Offering	14,270	$ 201.60	January 7, 2024
Consultant	750	$ 116.00	September 11, 2024
Total	1,290,273		

Effective May 19, 2022, 1,071,453 Series A warrants issued in the Company's November 2019 public and private securities offerings expired in accordance with the terms of the respective purchase agreement under which the securities had been issued. During the nine months ended September 30, 2021, a combined total of 481,973 Series A and Series B warrants issued in the Company's November 2019 securities offering were exercised by warrant holders, providing $3,856 in cash proceeds. During the nine months ended September 30, 2022, no warrants were exercised by warrant holders.

Reserved Shares

The following shares of common stock were reserved for future issuance upon exercise of stock options, vesting of RSUs and conversion of warrants:

	September 30, 2022	December 31, 2021
Stock Options	953,787	722,765
RSUs	27,123	9,430
Warrants	1,290,273	2,361,726
Total number of common shares reserved for future issuance	2,271,183	3,093,921

ITEM 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS.

(All dollar amounts are stated in thousands)

Forward-Looking Statements

This Quarterly Report on Form 10-Q contains "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). These statements relate to our future plans, objectives, expectations and intentions and may be identified by words such as "may," "will," "should," "expects," "plans," "anticipate," "intends," "target," "projects," "contemplates," "believe," "estimates," "predicts," "potential," and "continue," or similar words.

Although we believe that our expectations are based on reasonable assumptions within the limits of our knowledge of our business and operations, these forward-looking statements contained in this document are neither promises nor guarantees. Our business is subject to significant risk and uncertainties and there can be no assurance that our actual results will not differ materially from our expectations. These forward-looking statements include, but are not limited to, statements concerning our business plans and strategies; expected future financial results and cash requirements; statements related to the coronavirus pandemic and its potential adverse impacts; the impact from the war in Ukraine and the resulting economic and other sanctions imposed on Russia; plans for obtaining additional funding; plans and expectations that depend on our ability to continue as a going concern; and plans for development and commercialization of our Yield10 technologies. Such forward-looking statements are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated including, without limitation, risks related to our limited cash resources, uncertainty about our ability to secure additional funding, risks related to the execution of our business plans and strategies, risks associated with the protection and enforcement of our intellectual property rights, as well as other risks and uncertainties set forth under the caption "Risk Factors" in Part I, Item 1A, of the Company's Annual Report on Form 10-K for the year ended December 31, 2021 and in our other filings with the SEC.

The forward-looking statements and risk factors presented in this document are made only as of the date hereof and we do not intend to update any of these risk factors or to publicly announce the results of any revisions to any of our forward-looking statements other than as required under the federal securities laws.

Unless the context otherwise requires, all references in this Quarterly Report on Form 10-Q to "Yield10 Bioscience," "Yield10," "we," "our," "us," "our company" or "the company" refer to Yield10 Bioscience, Inc., a Delaware corporation, and its subsidiaries.

Overview

Yield10 Bioscience, Inc. ("Yield10" or the "Company") is an agricultural bioscience company that is developing the oilseed Camelina sativa ("Camelina") as a platform crop for large scale production of low carbon sustainable seed products to address:

- petroleum replacement markets, in which we are developing Camelina oil for use as a biofuel feedstock and PHA Bioplastics produced in Camelina seed for use as a biodegradable bioplastic; and
- food and nutrition markets, in which we are developing omega-3 (EPA, DHA+EPA) oils produced in Camelina seed for aquaculture, nutraceuticals and protein meal for animal feed markets.

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 offer improved on-farm performance that we anticipate will lead to increased acreage adoption and grain product revenue. We also plan to create additional value for our shareholders by licensing yield and seed oil traits from our pipeline to large seed companies for commercialization in major food crops, including corn, soybean and canola.

We have initiated small scale commercial Camelina grain production this fall for the renewable diesel market using third-party growers for seed multiplication of our winter Camelina plant varieties. These plants were harvested this past summer and shipped to a commercial seed conditioner for processing and packaging before being provided to farmers for planting. Yield10's commercial team is in the process of establishing an initial grower network for this first production of Camelina grain that will be harvested in the summer of 2023. We plan to sell this grain harvest into the renewable diesel market. We anticipate that future acreage under contract for the production of Camelina grain will expand over time as we increase our grower network and ramp up commercial operations for both spring and winter growing seasons.

Our results of operations could be adversely affected by general conditions in the global economy and in the global financial markets, including changes in inflation, interest rates and overall economic conditions and uncertainties. For instance, for the twelve months ended September 30, 2022, the U.S. Bureau of Labor Statistics reported that the Consumer Price Index for All Urban Consumers increased 8.2 percent. If the inflation rate continues to increase, for example due to increases in the costs of labor and supplies, it will affect our expenses and it might make it more expensive for us to continue our research and development. Inflation could also adversely affect the ability of growers to enter into and fulfill their obligations under Camelina grain production agreements with us.

Yield10 is headquartered in Woburn, Massachusetts and has an Oilseed Center of Excellence in Saskatoon, Saskatchewan, Canada.

Government Grants

On February 26, 2021, Yield10 Oilseeds Inc. ("YOI"), the Company’s wholly-owned Canadian research subsidiary, received a research grant through the Industrial Research Assistance Program administered by National Research Council Canada ("NRC"). The objective of the grant was to provide financial research assistance to innovative, early-stage small and medium-sized enterprises. Under the terms of the agreement, NRC agreed to contribute up to a maximum of $39 for payroll costs incurred by YOI during the period from December 20, 2020 to March 13, 2021. During the first quarter of 2021, YOI submitted claims for eligible payroll costs and recognized grant revenue for the full amount of the award.

During 2018, we entered into a sub-award with Michigan State University ("MSU") to support a Department of Energy ("DOE") funded grant entitled "*A Systems Approach to Increasing Carbon Flux to Seed Oil.*" Our participation under this five-year grant has been awarded incrementally on an annual basis with the first year commencing on September 15, 2017. Cumulative funding for this sub-award for the full grant amount of $2,957 was appropriated by the U.S. Congress through the contractual year ending in September 2022. During the three and nine months ended September 30, 2022, we recognized $111 and $363, respectively, from the sub-award. During the three and nine months ended September 30, 2021, we recognized $92 and $423 in grant revenue, respectively, from the sub-award.

As of September 30, 2022, proceeds of $146 remain to be recognized under our MSU sub-award as shown in the table below. During June 2022, the parties amended the sub-award to extend its termination date to September 14, 2023, allowing Yield10 time to utilize the remaining grant funds. These remaining contractual funds include amounts for reimbursement to our subcontractors, as well as reimbursement for our employees’ time, benefits and other expenses related to future performance.

Program Title	**Funding Agency**	**Total Government Funded Appropriations**	**Total revenue recognized through September 30, 2022**	**Remaining amount to be recognized as of September 30, 2022**	**Contract/Grant Expiration**
Subcontract from Michigan State University project funded by DOE entitled "A Systems Approach to Increasing Carbon Flux to Seed Oil"	Department of Energy	$ 2,957	$ 2,811	$ 146	September 2023
Funding from National Research Council Canada through its Industrial Research Assistance Program (NRC-IRAP) entitled "Innovation Assistance Program - Round 2.5"	National Research Council Canada	39	39	—	March 2021
Total		$ 2,996	$ 2,850	$ 146	

Critical Accounting Estimates and Judgments

The discussion and analysis of our financial condition and results of operations are based upon our unaudited condensed consolidated financial statements, which have been prepared in accordance with GAAP for interim financial information. The preparation of these unaudited condensed consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates, including those related to revenue recognition, stock-based and performance-based compensation, measurement of right-of-use assets and lease liabilities, the recognition of lease expense and income taxes. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates. The critical accounting policies and the significant judgments and estimates used in the preparation of our unaudited condensed consolidated financial statements for the three and nine months ended September 30, 2022, were consistent with those discussed in our Annual Report on Form 10-K for the year ended December 31, 2021, in the section captioned "Management's Discussion and Analysis of Financial Condition and Results of Operations—Critical Accounting Estimates and Judgments."

Results of Operations

Comparison of the Three Months Ended September 30, 2022 and 2021

Revenue

	Three Months Ended September 30,		
	2022	**2021**	**Change**
Grant revenue	$ 111	$ 92	$ 19

Grant revenue was consistent at $111 and $92 for the three months ended September 30, 2022 and September 30, 2021, respectively. All of the grant revenue recorded during these two periods was derived from the Company's DOE sub-award with MSU.

We anticipate that grant revenue will decrease during the year ended December 31, 2022 in comparison to the year ended December 31, 2021, as a result of lower grant appropriations remaining to be earned from the final appropriation of our MSU sub-award that was originally scheduled to end in September 2022. During the three months ended September 30, 2022, the MSU sub-award was amended to extend the termination date through September 2023 in order to utilize remaining funds of $146 available from the final contract year. We currently cannot assess whether additional U.S. or Canadian government research grants will be awarded to us during the next year.

We have contracted with growers in Canada and the U.S. for small scale Camelina winter grain production this fall, for approximately 1,000 acres, to supply the renewable diesel fuel market. Harvest of this first winter commercial grain production is expected to occur in the summer of 2023, at which time we anticipate that we may begin to recognize grain revenue in amounts scaled to the grain yield and the number of acres under contract. Future grain revenues will be based, among other things, on our ability to scale up commercial seed production, engage with growers and enter into offtake agreements with customers in the renewable diesel market.

Expenses

	Three Months Ended September 30,		
	2022	**2021**	**Change**
Research and development expenses	$ 2,083	$ 1,636	$ 447
General and administrative expenses	1,518	1,547	(29)
Total expenses	$ 3,601	$ 3,183	$ 418

Research and Development Expenses

Research and development expenses increased from $1,636 during the three months ended September 30, 2021 to $2,083 during the three months ended September 30, 2022. The $447, or 27 percent increase, is primarily due to higher employee compensation and benefit expenses and costs associated with crop trials and pre-commercial Camelina seed production. Employee compensation and benefits increased by $157 from $865 during the three months ended September 30, 2021 to $1,022 during the three months ended September 30, 2022, and was primarily the result of a $127 increase in payroll expense generated from annual employee compensation increases and our hiring of research and development staff. During the three months ended September 30, 2022, we incurred $124 in expense for pre-commercial Camelina seed production, including seed multiplication, cleaning, treatment and storage costs. We did not incur similar expenses during the three months ended September 30, 2021. Crop trial expense increased by $104 during the three months ended September 30, 2022 as a result of greater fieldwork being conducted to evaluate Camelina plant varieties, including the development of herbicide tolerant Camelina plant varieties.

Based on current planning and forecasting, we anticipate that our research and development expenses during the years ended December 31, 2022 and December 31, 2023 will continue at levels above those incurred during the year ended December 31, 2021, as we continue our efforts to develop and commercialize Camelina plant varieties for the following markets: feedstock oil for renewable diesel, PHA bioplastics, omega-3 oil for nutraceuticals and aquaculture fish feed and as a protein meal to be used in animal feed markets. The increased expenses will include employee compensation and benefits from recent and future personnel hiring, seed scale up operations and pre-commercial Camelina production activities. Our forecast related to research and development expense is subject to change and may be impacted by our ability to raise additional cash to support our planned operations, the potential impact of the COVID-19 pandemic or the advent of new third-party collaborations or other business opportunities that could alter our plans.

General and Administrative Expenses

General and administrative expenses for the three months ended September 30, 2022 and September 30, 2021 remained consistent, decreasing by $29, or 2%, from $1,547 to $1,518.

Based on current planning and forecasting, we expect that our general and administrative expenses during the year ended December 31, 2022 will remain slightly higher than expenses incurred during the previous year. We also anticipate that our general and administrative expenses will increase modestly during the year ended December 31, 2023, as we ramp up support for our Camelina commercial operations. Our forecast related to these expenses is subject to change and may be impacted by our ability to raise additional cash to support our plans, the potential impact of the COVID-19 pandemic or new third-party collaborations or other business opportunities that could alter our plans.

Other Income (Expense), Net

	Three Months Ended September 30,		
	2022	**2021**	**Change**
Gain on investment in related party	$ —	$ 700	$ (700)
Other income (expense), net	10	(1)	11
Total other income (expense), net	$ 10	$ 699	$ (689)

Gain on Investment in Related Party

During 1999, Yield10 entered into a technology sublicense agreement with Tepha, Inc. ("Tepha"), a privately held related party engaged in the development of medical products. Yield10 received 648,149 shares of Series A Convertible Preferred Stock of Tepha ("Tepha Shares") during 2002 as consideration for outstanding license payments due to Yield10 totaling $700. During 2005, the Company determined the value of the Tepha Shares was impaired resulting in their write off through a charge to other income (expense). In May 2021, the board of directors of Tepha approved and authorized the merger of Tepha with Becton Dickinson Global Holdings, Inc. ("Becton Dickinson") and on July 26, 2021, Yield10 received cash consideration of $700 in exchange for the surrender of its Tepha Shares upon the closing of the sale of Tepha to Becton Dickinson. As a result, the Company recorded the $700 as a gain on investment in related party within other income (expense) during the three months ended September 30, 2021.

Other Income (Expense), net

Other income (expense) for the three months ended September 30, 2022 and September 30, 2021 were derived primarily from investment income earned from the Company's cash equivalents and investments offset by interest expense and investment management fees incurred during the period.

Comparison of the Nine Months Ended September 30, 2022 and 2021

Revenue

	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021	Change
Grant revenue	$ 363	$ 462	$ (99)

Grant revenue was $363 and $462 for the nine months ended September 30, 2022 and September 30, 2021, respectively. All of the grant revenue recorded during the nine months ended September 30, 2022 was derived from the Company's DOE sub-award with MSU. During the nine months ended September 30, 2021, grant revenue of $423 and $39 was recognized from the DOE sub-award and the short-term NRC grant that was awarded in February 2021, respectively.

Expenses

	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021	Change
Research and development expenses	$ 5,862	$ 4,603	$ 1,259
General and administrative expenses	4,748	4,583	165
Total expenses	$ 10,610	$ 9,186	$ 1,424

Research and Development Expenses

Research and development expenses increased from $4,603 during the nine months ended September 30, 2021 to $5,862 during the nine months ended September 30, 2022. The $1,259, or 27 percent year-to-date increase, is primarily due to higher employee compensation and benefits expenses, expanded crop trial costs, higher third-party research services and costs associated with pre-commercial Camelina seed production. Employee compensation and benefits increased by $499 from $2,677 during the nine months ended September 30, 2021 to $3,176 during the nine months ended September 30, 2022. The increase is primarily the result of a $451 increase in payroll charges generated from annual employee compensation increases and our hiring of additional staff. Stock-based employee compensation expense also increased by $93 during the nine months ended September 30, 2022 due to employee stock options awarded in the past year. Lower recruiting related expenses of $110 offset a portion of these increased employee related expenses. Crop trial expense increased by $145 during the nine months ended September 30, 2022 in comparison to the same nine months of the previous year and primarily stems from our evaluation of Camelina plant varieties, including those demonstrating herbicide tolerance. Third-party research services increased by $167 during the nine months ended September 30, 2022 in comparison to the nine months ended September 30, 2021, and is the result of DNA sequencing and other analytical work undertaken for regulatory purposes. During the nine months ended September 30, 2022, we also incurred $252 in charges for pre-commercial Camelina seed production, including seed multiplication, cleaning, treatment and storage costs. We did not have similar expenses during the nine months ended September 30, 2021.

General and Administrative Expenses

General and administrative expenses for the nine months ended September 30, 2022 and September 30, 2021 increased by $165 from $4,583 to $4,748. The 4 percent year-to-date increase is primarily due to increases in employee compensation and benefits expenses. Employee compensation and benefits expense increased by $209 from $2,069 during the nine months ended September 30, 2021 to $2,278 during the nine months ended September 30, 2022, and is primarily the result of a $108 increase in payroll expenses generated from annual employee compensation increases and our hiring of additional staff. During the nine months ended September 30, 2022, stock-based compensation also increased by $190 due to employee stock awards issued during the past year. Recruiting expenses were down $86 during the nine months ended September 30, 2022 compared to the first nine months of 2021.

Other Income (Expense), Net

	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021	Change
Gain on investment in related party	$ —	$ 700	$ (700)
Other income (expense), net	11	(2)	13
Total expenses	$ 11	$ 698	$ (687)

Gain on Investment in Related Party

In May 2021, the board of directors of Tepha, a related party, approved and authorized the sale of Tepha to Becton Dickinson Global Holdings, Inc. The merger closed on July 21, 2021 and Yield10 received cash consideration of $700 for the surrender of its Tepha Shares. As a result, the Company recorded the $700 as a gain on investment in related party within other income (expense) during the three months ended September 30, 2021.

Other Income (Expense), net

Other income (expense) for the nine months ended September 30, 2022 and September 30, 2021 were derived primarily from investment income earned from the Company's cash equivalents and investments offset by interest expense and investment management fees incurred during the period.

Liquidity and Capital Resources

Currently, we require cash to fund our working capital needs, to purchase capital assets, and to pay our operating lease obligations and other operating costs. The primary sources of our liquidity have historically included equity financings, government funded research grants and income earned on cash and investments.

Since our inception, we have incurred significant expenses related to our research, development and product commercialization efforts. With the exception of 2012, we have recorded losses since our initial founding, including the three and nine months ended September 30, 2022. As of September 30, 2022, we had an accumulated deficit of $396,394. Our unrestricted cash, cash equivalents and investments are held primarily for working capital purposes and as of September 30, 2022, totaled $7,405 compared to cash, cash equivalents and investments of $15,990 at December 31, 2021. As of September 30, 2022, we had restricted cash of $264, consisting of $229 held in connection with the lease agreement for our Woburn, Massachusetts facility and $35 held in connection with our corporate credit card program. As of September 30, 2022, we continued to have no outstanding debt.

Our management is currently evaluating different strategies to obtain the required funding for our operations. These strategies may include, but are not limited to: public and private placements of equity and/or debt, licensing and/or collaboration arrangements and strategic alternatives with third parties, or other funding from the government or third parties. Our ability to secure funding is subject to numerous risks and uncertainties, including the impact of the COVID-19 pandemic, geopolitical turmoil, and economic uncertainty related to rising inflation and disruptions in the global supply chain. As a result, there can be no assurance that these funding efforts will be successful. The sale of equity and convertible debt securities may result in dilution to our stockholders and, in the case of preferred equity securities or convertible debt, those securities could provide for rights, preferences or privileges senior to those of our common stock. The terms of debt securities issued or borrowings pursuant to a credit agreement could impose significant restrictions on our operations. If we raise funds through collaborations and licensing arrangements, we might be required to relinquish significant rights to our technologies or products or grant licenses on terms that are not favorable to us. Additional capital may not be available on reasonable terms, or at all.

Investments are made in accordance with our corporate investment policy, as approved by our Board of Directors. The primary objective of this policy is to preserve principal. Consequently, our investments are limited to high quality corporate debt, U.S. Treasury bills and notes, money market funds, bank debt obligations, municipal debt obligations and asset-backed securities. The policy establishes maturity limits, concentration limits, and liquidity requirements. As of September 30, 2022, we were in compliance with this policy.

Material Cash Requirements

We currently anticipate net cash usage of $12,000 to $12,500 to fund operations during the full year 2022, including our expanded research and development activities and our preparations for the future commercial launch of our Camelina products.

We routinely enter into contractual commitments with third parties to support our operating activities. The more significant of these commitments includes real estate operating leases for our office, laboratory and greenhouse facilities located in the U.S. and Canada. In addition, we typically enter into annual premium funding arrangements through our insurance broker that allows us to spread the payment of our directors' and officers' liability and other business insurance premiums over the terms of the policies. Our material commitments also include annual arrangements with third party growers located in North and South America for the execution of crop trials and seed scale-up activities to further our trait development goals and to progress the commercial development of our Camelina plant varieties. The aggregate cost of these contracted crop activities is substantial. In the fall of 2022, we also began entering into Camelina grain production contracts for the winter 2022/2023 season containing minimum guaranteed payments per acre as an incentive for growers to work with us. From time-to-time, we also enter into exclusive research licensing and collaboration arrangements with third parties for the development of intellectual property related to trait development. These long-term agreements typically include initial licensing payments and future contingent milestone payments associated with regulatory filings and approvals as well as potential royalty payments based on future product sales. Generally, these licensing arrangements contain early termination provisions within the terms of the respective agreements.

The Company has no off-balance sheet arrangements as defined in Item 303(b) of Regulation S-K of the Securities Exchange Act of 1934.

Going Concern

We follow the guidance of ASC Topic 205-40, *Presentation of Financial Statements-Going Concern*, in order to determine whether there is substantial doubt about our ability to continue as a going concern for one year after the date our financial statements are available to be issued. Based on our current cash forecast, we expect that our present capital resources will not be sufficient to fund our planned operations for at least that period of time, which raises substantial doubt as to the Company's ability to continue as a going concern. This forecast of cash resources is forward-looking information that involves risks and uncertainties, and the actual amount of expenses could vary materially and adversely as a result of a number of factors. Our ability to continue operations after our current cash resources are exhausted will depend upon our ability to obtain additional financing through, among other sources, public or private equity financing, secured or unsecured debt financing, equity or debt bridge financing, warrant holders' ability and willingness to exercise the Company's outstanding warrants, additional government research grants or collaborative arrangements with third parties, as to which no assurances can be given. We do not know whether additional financing will be available on terms favorable or acceptable to us when needed, if at all. If additional funds are not available when required, we will be forced to curtail our research efforts, explore strategic alternatives and/or wind down our operations and pursue options for liquidating our remaining assets, including intellectual property and equipment.

If we issue equity or debt securities to raise additional funds, (i) we may incur fees associated with such issuances, (ii) our existing stockholders will experience dilution from the issuance of new equity securities, (iii) we may incur ongoing interest expense and be required to grant a security interest in our assets in connection with any debt issuance, and (iv) the new equity or debt securities may have rights, preferences and privileges senior to those of our existing stockholders. In addition, utilization of our net operating loss and research and development credit carryforwards may be subject to significant annual limitations under Section 382 of the Internal Revenue Code of 1986 due to ownership changes resulting from future equity financing transactions. If we raise additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to our potential products or proprietary technologies or grant licenses on terms that are not favorable to us.

Cash Usage During the Nine Months Ended September 30, 2022

Net cash used for operating activities during the nine months ended September 30, 2022 was $8,342, compared to net cash used for operating activities during the nine months ended September 30, 2021 of $6,768. Net cash used for operating activities during the nine months ended September 30, 2022 primarily reflects the net loss of $10,263, cash payments made to reduce lease liabilities of $385 and our payment of 2021 bonus compensation of $378 during early 2022. Non-cash charges offsetting a portion of the net loss include depreciation and amortization expense of $197, our 401(k) matching contribution in common stock of $111, stock-based compensation expense of $1,458, and non-cash lease expense of $291. Net cash used for operating activities during the nine months ended September 30, 2021 was $6,768 and primarily reflects the net loss of $8,051, cash payments made to reduce lease liabilities and to pay 2020 bonus compensation of $342 and $460, respectively. Non-cash charges offsetting a portion of the net loss included depreciation and amortization expense of $165, our 401(k) matching contribution in common stock of $100, stock-based compensation expense of $1,175, and non-cash lease expense of $265.

Net cash of $7,022 was provided by investing activities during the nine months ended September 30, 2022, primarily as a result of receiving proceeds of $8,371 from investments reaching maturity and converting into cash, partially offset by our purchase of $1,195 in new investments. During the nine months ended September 30, 2022, we also purchased $154 in laboratory equipment. During the nine months ended September 30, 2021, $2,229 in net cash was provided from investing activities. During the nine months of 2021, we purchased $147 of laboratory equipment and $3,874 in new investments, offset by cash proceeds of $6,250 from maturing investments.

Net cash of $37 was used by financing activities during the nine months ended September 30, 2022, compared to net cash of $15,746 provided by financing activities during the nine months ended September 30, 2021. During the nine months ended September 30, 2021, we completed a public offering of 1,040,000 shares of our common stock at a price of $12.25 per share, receiving proceeds of $12,740, before issuance costs of $747. Also, during the nine months ended September 30, 2021, a total of 481,973 Series A and Series B warrants issued in our November 2019 securities offering were exercised by warrant holders, providing $3,856 in cash proceeds. During the nine months ended September 30, 2022, no warrants were exercised by warrant holders.

Recent Accounting Pronouncements

See Note 2, "Accounting Policies," to our condensed consolidated financial statements included in this Quarterly Report on Form 10-Q for a full description of recent accounting pronouncements.

ITEM 3. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK.

Not applicable.

ITEM 4. CONTROLS AND PROCEDURES.

Evaluation of Disclosure Controls and Procedures

Our management (with the participation of our Principal Executive Officer and Principal Accounting Officer) evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act), as of September 30, 2022. Disclosure controls and procedures are designed to ensure that information required to be disclosed by the Company in the reports it files or submits under the Exchange Act is recorded, processed, summarized and reported on a timely basis and that such information is accumulated and communicated to management, including the Principal Executive Officer and the Principal Accounting Officer, as appropriate, to allow timely decisions regarding disclosure. Based on this evaluation, our Principal Executive Officer and Principal Accounting Officer concluded that these disclosure controls and procedures are effective.

Changes in Internal Control over Financial Reporting

There have been no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) under the Exchange Act) during the quarter ended September 30, 2022 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II — OTHER INFORMATION

ITEM 1. LEGAL PROCEEDINGS.

From time to time, the Company may be subject to legal proceedings and claims in the ordinary course of business. The Company is not currently aware of any such proceedings or claims that it believes will have, individually or in the aggregate, a material adverse effect on the business, financial condition or the results of operations.

ITEM 1A. RISK FACTORS.

There have been no material changes to the risk factors described in our Annual Report on Form 10-K for the year ended December 31, 2021, filed with the SEC on March 25, 2022, as amended and supplemented by the risk factors described in our Quarterly Report on Form 10-Q for the quarter ended March 31, 2022, filed with the SEC on May 11, 2022.

ITEM 2. UNREGISTERED SALES OF EQUITY SECURITIES AND USE OF PROCEEDS.

Recent Sales of Unregistered Securities

On October 4, 2022, we issued 10,914 shares of common stock to participants in the Yield10 Bioscience, Inc. 401(k) Plan as a matching contribution. The issuance of these securities is exempt from registration pursuant to Section 3(a)(2) of the Securities Act as exempted securities.

Issuer Purchases of Equity Securities

During the three months ended September 30, 2022, there were no repurchases made by us or on our behalf, or by any “affiliated purchasers,” of shares of our common stock.

ITEM 3. DEFAULTS UPON SENIOR SECURITIES.

None.

ITEM 4. MINE SAFETY DISCLOSURES.

Not applicable.

ITEM 5. OTHER INFORMATION.

None.

ITEM 6. EXHIBITS.

31.1	Certification Pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934 of the Principal Executive Officer (filed herewith).
31.2	Certification Pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934 of the Principal Financial Officer (filed herewith).
32.1	Section 1350 Certification (furnished herewith).
101.INS	Inline XBRL Instance Document (the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document) (filed herewith).
101.SCH	Inline XBRL Taxonomy Extension Schema Document (filed herewith).
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document (filed herewith).
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document (filed herewith).
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document (filed herewith).
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document (file herewith).
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101) (filed herewith).

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the Registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

YIELD10 BIOSCIENCE, INC.

November 14, 2022	By:	/s/ OLIVER PEOPLES
		Oliver Peoples *President and Chief Executive Officer* *(Principal Executive Officer)*
November 14, 2022	By:	/s/ CHARLES B. HAASER
		Charles B. Haaser *Chief Accounting Officer* *(Principal Financial and Accounting Officer)*

EXHIBIT 31.1

CERTIFICATION

I, Oliver Peoples, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Yield10 Bioscience, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: November 14, 2022

/s/ OLIVER PEOPLES

Name:	Oliver Peoples
Title:	*President and Chief Executive Officer* *(Principal Executive Officer)*

EXHIBIT 31.2

CERTIFICATION

I, Charles B. Haaser, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Yield10 Bioscience, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

(a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

(b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

(c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

(d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

(a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

(b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Dated: November 14, 2022	/s/ CHARLES B. HAASER	
	Name:	Charles B. Haaser
	Title:	*Chief Accounting Officer* *(Principal Financial and Accounting Officer)*

EXHIBIT 32.1

**CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Quarterly Report on Form 10-Q of Yield10 Bioscience, Inc. (the "Company") for the quarter ended September 30, 2022 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we, Oliver Peoples, President, Chief Executive Officer and Principal Executive Officer of the Company and Charles B. Haaser, Chief Accounting Officer and Principal Financial and Accounting Officer of the Company, certify, pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, to our knowledge that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d), as applicable, of the Securities Exchange Act of 1934, as amended; and

2. The information in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

This certification is being provided pursuant to 18 U.S.C. 1350 and is not to be deemed a part of the Report, nor is it to be deemed to be "filed" for any purpose whatsoever.

Dated: November 14, 2022

/s/ OLIVER PEOPLES
Oliver Peoples
President and Chief Executive Officer
(Principal Executive Officer)

Dated: November 14, 2022

/s/ CHARLES B. HAASER
Charles B. Haaser
Chief Accounting Officer
(Principal Financial and Accounting Officer)