
**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, 2021

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

(State or other jurisdiction of
incorporation or organization)

**19 Presidential Way
Woburn, MA**

(Address of principal executive offices)

04-3158289

(I.R.S. Employer
Identification No.)

01801

(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

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

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	<input type="checkbox"/>	Accelerated filer	<input type="checkbox"/>
Non-accelerated filer	<input checked="" type="checkbox"/>	Smaller reporting company	<input checked="" type="checkbox"/>
Emerging growth company	<input type="checkbox"/>		

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.

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

The number of shares outstanding of the registrant's common stock as of November 8, 2021 was 4,881,851.

Yield10 Bioscience, Inc.
Form 10-Q
For the Quarter Ended September 30, 2021

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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, 2021	December 31, 2020
Assets		
Current Assets:		
Cash and cash equivalents	\$ 14,618	\$ 3,423
Short-term investments	3,904	6,279
Accounts receivable	24	86
Unbilled receivables	46	27
Prepaid expenses and other current assets	462	527
Total current assets	19,054	10,342
Restricted cash	264	264
Property and equipment, net	903	921
Right-of-use assets	2,447	2,712
Other assets	278	283
Total assets	<u>\$ 22,946</u>	<u>\$ 14,522</u>
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable	\$ 45	\$ 60
Accrued expenses	1,122	1,297
Current portion of lease liabilities	499	457
Total current liabilities	1,666	1,814
Lease liabilities, net of current portion	2,783	3,163
Other long-term liabilities	9	13
Total liabilities	<u>4,458</u>	<u>4,990</u>
Commitments and contingencies (Note 10)		
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, 2021 and December 31, 2020; 4,877,987 and 3,334,048 shares issued and outstanding at September 30, 2021 and December 31, 2020, respectively	49	33
Additional paid-in capital	401,760	384,758
Accumulated other comprehensive loss	(170)	(159)
Accumulated deficit	(383,151)	(375,100)
Total stockholders' equity	<u>18,488</u>	<u>9,532</u>
Total liabilities and stockholders' equity	<u>\$ 22,946</u>	<u>\$ 14,522</u>

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,	
	2021	2020	2021	2020
Revenue:				
Grant revenue	\$ 92	\$ 204	\$ 462	\$ 604
Total revenue	92	204	462	604
Expenses:				
Research and development	1,636	1,300	4,603	3,939
General and administrative	1,547	1,098	4,583	3,664
Total expenses	3,183	2,398	9,186	7,603
Loss from operations	(3,091)	(2,194)	(8,724)	(6,999)
Other income (expense):				
Change in fair value of warrants	—	—	—	(957)
Loan forgiveness income (Note 9)	—	—	—	333
Gain on investment in related party	700	—	700	—
Other income (expense), net	(1)	37	(2)	85
Total other income (expense)	699	37	698	(539)
Net loss from operations before income taxes	(2,392)	(2,157)	(8,026)	(7,538)
Income tax provision	(6)	(11)	(25)	(26)
Net loss	\$ (2,398)	\$ (2,168)	\$ (8,051)	\$ (7,564)
Basic and diluted net loss per share	\$ (0.49)	\$ (0.87)	\$ (1.72)	\$ (3.69)
Number of shares used in per share calculations:				
Basic and diluted	4,873,248	2,492,274	4,681,292	2,050,726

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,	
	2021	2020	2021	2020
Net loss:	\$ (2,398)	\$ (2,168)	\$ (8,051)	\$ (7,564)
Other comprehensive loss				
Change in unrealized gain (loss) on investments	—	(6)	1	1
Change in foreign currency translation adjustment	(17)	5	(12)	(43)
Total other comprehensive loss	(17)	(1)	(11)	(42)
Comprehensive loss	<u>\$ (2,415)</u>	<u>\$ (2,169)</u>	<u>\$ (8,062)</u>	<u>\$ (7,606)</u>

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,	
	2021	2020
Cash flows from operating activities		
Net loss	\$ (8,051)	\$ (7,564)
Adjustments to reconcile net loss to cash used in operating activities:		
Depreciation and amortization	165	137
Change in fair value of warrants	—	957
Loan forgiveness income (Note 9)	—	(333)
Loss on disposal of fixed assets	—	206
Charge for 401(k) company common stock match	100	95
Stock-based compensation	1,175	506
Non-cash lease expense	265	345
Deferred income tax provision	24	33
Changes in operating assets and liabilities:		
Accounts receivable	62	(76)
Unbilled receivables	(19)	(36)
Prepaid expenses and other assets	60	92
Accounts payable	(15)	(228)
Accrued expenses	(192)	(324)
Lease liabilities	(338)	(495)
Other liabilities	(4)	15
Net cash used for operating activities	(6,768)	(6,670)
Cash flows from investing activities		
Purchase of property and equipment	(147)	(42)
Proceeds from sale of property and equipment	—	10
Purchase of investments	(3,874)	(6,290)
Proceeds from the maturity of short-term investments	6,250	3,197
Net cash provided by (used by) investing activities	2,229	(3,125)
Cash flows from financing activities		
Proceeds from warrants exercised (Note 12)	3,856	1,658
Proceeds from PPP loan (Note 9)	—	333
Proceeds from public offering, net of issuance costs	11,993	5,367
Taxes paid on employees' behalf related to vesting of stock awards	(103)	(17)
Net cash provided by financing activities	15,746	7,341
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(12)	(46)
Net increase (decrease) in cash, cash equivalents and restricted cash	11,195	(2,500)
Cash, cash equivalents and restricted cash at beginning of period	3,687	5,749
Cash, cash equivalents and restricted cash at end of period	\$ 14,882	\$ 3,249
Supplemental disclosure of non-cash information:		
Offering costs remaining in accrued expenses	\$ —	\$ 63

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

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

Three Months Ended September 30, 2021										
	Series B Convertible Preferred Stock		Series A Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Par Value	Shares	Par Value	Shares	Par Value				
Balance, June 30, 2021	—	\$ —	—	\$ —	4,868,466	\$ 49	\$ 401,319	\$ (153)	\$ (380,753)	\$ 20,462
Non-cash 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

Three Months Ended September 30, 2020										
	Series B Convertible Preferred Stock		Series A Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income (Loss)	Accumulated Deficit	Total Stockholders' Equity
	Shares	Par Value	Shares	Par Value	Shares	Par Value				
Balance, June 30, 2020	—	\$ —	—	\$ —	1,972,798	\$ 20	\$ 378,924	\$ (167)	\$ (370,290)	\$ 8,487
Non-cash stock-based compensation expense	—	—	—	—	—	—	243	—	—	243
Issuance of common stock for 401(k) match	—	—	—	—	3,689	—	23	—	—	23
Issuance of common stock for restricted stock units	—	—	—	—	6,006	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	—	—	—	—	(17)	—	—	(17)
Issuance of common stock for concurrent private and public offerings, net of offering costs of \$425	—	—	—	—	1,348,285	13	5,292	—	—	5,305
Effect of foreign currency translation and unrealized loss on investments	—	—	—	—	—	—	—	(1)	—	(1)
Net loss	—	—	—	—	—	—	—	—	(2,168)	(2,168)
Balance, September 30, 2020	—	\$ —	—	\$ —	3,330,778	\$ 33	\$ 384,465	\$ (168)	\$ (372,458)	\$ 11,872

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

Nine Months Ended September 30, 2021

	Series B Convertible Preferred Stock		Series A Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
	Shares	Par Value	Shares	Par Value	Shares	Par Value				
Balance, December 31, 2020	—	\$ —	—	\$ —	3,334,048	\$ 33	\$ 384,758	\$ (159)	\$ (375,100)	\$ 9,532
Non-cash 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 exercise	—	—	—	—	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

Nine Months Ended September 30, 2020

	Series B Convertible Preferred Stock		Series A Convertible Preferred Stock		Common Stock		Additional Paid-In Capital	Accumulated other Comprehensive Loss	Accumulated Deficit	Total Stockholders' Equity
	Shares	Par Value	Shares	Par Value	Shares	Par Value				
December 31, 2019	5,750	\$ —	796	\$ —	933,423	\$ 9	\$ 360,926	\$ (126)	\$ (364,894)	\$ (4,085)
Non-cash stock-based compensation expense	—	—	—	—	—	—	597	—	—	597
Issuance of common stock for 401(k) match	—	—	—	—	17,518	—	86	—	—	86
Issuance of common stock for restricted stock units	—	—	—	—	6,006	—	—	—	—	—
Taxes paid on employees' behalf related to vesting of stock awards	—	—	—	—	—	—	(17)	—	—	(17)
Issuance of common stock for warrant exercise	—	—	—	—	207,296	2	1,656	—	—	1,658
Issuance of common stock upon conversion of Series A Convertible Preferred Stock	—	—	(796)	—	99,500	2	(2)	—	—	—
Issuance of common stock upon conversion of Series B Convertible Preferred Stock	(5,750)	—	—	—	718,750	7	(7)	—	—	—
Reclassification of warrant liability to equity	—	—	—	—	—	—	15,934	—	—	15,934
Issuance of common stock for concurrent private and public offerings, net of offering costs of \$425	—	—	—	—	1,348,285	13	5,292	—	—	5,305
Effect of foreign currency translation and unrealized loss on investments	—	—	—	—	—	—	—	(42)	—	(42)
Net loss	—	—	—	—	—	—	—	—	(7,564)	(7,564)
Balance, September 30, 2020	—	\$ —	—	\$ —	3,330,778	\$ 33	\$ 384,465	\$ (168)	\$ (372,458)	\$ 11,872

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

(All dollar amounts, except share and per share amounts, are stated in thousands)

1. NATURE OF BUSINESS AND BASIS OF PRESENTATION

Yield10 Bioscience, Inc. ("Yield10" or the "Company") is an agricultural bioscience company that is using its differentiated trait gene discovery platform, the "Trait Factory", to develop improved Camelina varieties to produce proprietary products, and to produce other high value genetic traits for the agriculture and food industries. Yield10 is headquartered in Woburn, Massachusetts and has an Oilseed Center of Excellence in Saskatoon, Saskatchewan, Canada. The Company's goals are to efficiently develop and commercialize a high value crop products business by developing superior varieties of Camelina for the production of feedstock oils and meal, nutritional oils, and PHA bioplastics, and to license its yield traits to major seed companies for commercialization in major row crops, including corn, soybean and canola.

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 statements of the financial position and results of operations for the interim periods ended September 30, 2021 and September 30, 2020.

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, 2020, which are contained in the Company's [Annual Report on Form 10-K](#) filed with the SEC on March 16, 2021.

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, 2021.

As of September 30, 2021, the Company held unrestricted cash, cash equivalents and investments of \$18,522. 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 financial statements are issued. Based on its current cash forecast, management expects that the Company's present capital resources will be sufficient to fund its planned operations for at least that period of time. 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. 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 government 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 may be forced to curtail the Company's research efforts, explore strategic alternatives and/or wind down its operations and pursue options for liquidating its remaining assets, including intellectual property.

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.

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

Principles of Consolidation

The Company's unaudited condensed consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America. 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, Metabolix Oilseeds, Inc. ("MOI") and Yield10 Bioscience Securities Corp.

Reverse Stock Split

On January 15, 2020, the Company effected a 1-for-40 reverse stock split of its common stock. Unless otherwise indicated, all share amounts, per share data, share prices, and conversion rates set forth in these notes and the accompanying unaudited condensed financial statements have, where applicable, been adjusted retroactively to reflect this reverse stock split.

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, 2021	December 31, 2020
Cash and cash equivalents	\$ 14,618	\$ 3,423
Restricted cash	264	264
Total cash, cash equivalents and restricted cash	<u>\$ 14,882</u>	<u>\$ 3,687</u>

Amounts included in restricted cash represent those required to be set aside by contractual agreement. Restricted cash of \$264 at September 30, 2021 and December 31, 2020 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 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 MOI is the Canadian dollar. Foreign denominated assets and liabilities of MOI 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 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 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 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 and investments. 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, 2021, 100% of the Company's accounts and unbilled receivables are due from the Company's Michigan State University ("MSU") sub-award. During the three and nine months ended September 30, 2021, revenue earned from the MSU sub-award, represented 100.0% and 91.6% of recognized government grant revenue, respectively. A research grant of \$39 awarded to MOI through the Canadian Industrial Research Assistance Program ("IRAP") and earned during the first quarter of 2021, represented the remaining difference of 8.4% during nine months ended September 30, 2021. During the three and nine months ended September 30, 2020, the MSU sub-award represented 100.0% and 88.9%, respectively, of government grant revenue earned for each of the respective periods. The remaining difference of 11.1% during the nine months ended September 30, 2020 was from grant revenue recognized from an earlier Canadian research grant of \$67 awarded through IRAP.

Fair Value Measurements

The carrying amounts of the Company's financial instruments as of September 30, 2021 and December 31, 2020, which include cash equivalents, 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 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

Right-of-Use Assets

The Company's right-of-use assets consist of leased assets recognized in accordance with ASC 842, *Leases*, ("ASC 842") which requires lessees to recognize a lease liability and a corresponding right-of-use asset for long-term lease contracts. Right-of-use assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent its obligation to make lease payments arising from the lease, both of which are recognized based on the present value of the future minimum lease payments over the lease term at the commencement date. The Company uses its incremental borrowing rate in calculating the present value of future lease payments when interest rates are not implicit in the lease. Leases with terms of 12 months or less at inception are expensed as costs are incurred and not capitalized under 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, 2021 and December 31, 2020. 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 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 operations 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 statement 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 Financial Accounting Standards Board ("FASB") or other standard setting bodies that the Company adopts as of the specified effective date. During the three months ended September 30, 2021, the Company did not adopt any new accounting guidance.

In December 2019 the FASB issued Accounting Standards Update No. 2019-12, *Income Taxes (Topic 740): Simplifying the Accounting for Income Taxes*. This standard removes certain exceptions to the general principles in Topic 740 and simplifies certain other aspects of the accounting for income taxes. This standard became effective for us on January 1, 2021, and did not have a material impact on our consolidated financial statements and related disclosures.

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

3. BASIC AND DILUTED NET INCOME (LOSS) PER SHARE

Basic net income (loss) per share is computed by dividing net income (loss) by the weighted-average number of common shares outstanding. Diluted net income (loss) per share is computed by dividing net income (loss) 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 and the conversion of convertible preferred stock. 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, convertible preferred stock 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,	
	2021	2020
Options	716,619	326,881
Restricted Stock Awards	9,430	8,500
Warrants	2,361,726	2,843,699
Total	3,087,775	3,179,080

4. INVESTMENTS

Investments consist of the following at September 30, 2021 and December 31, 2020:

	Accumulated Cost at September 30, 2021	Unrealized		Market Value at September 30, 2021
		Gain	(Loss)	
Short-term investments				
U.S. government and agency securities	\$ 3,903	\$ 1	\$ —	\$ 3,904
Total	\$ 3,903	\$ 1	\$ —	\$ 3,904

	Accumulated Cost at December 31, 2020	Unrealized		Market Value at December 31, 2020
		Gain	(Loss)	
Short-term investments				
U.S. government and agency securities	\$ 6,279	\$ —	\$ —	\$ 6,279
Total	\$ 6,279	\$ —	\$ —	\$ 6,279

All investments are classified as available for sale as of September 30, 2021 and December 31, 2020.

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, 2021 and December 31, 2020 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, 2021 and December 31, 2020.

The tables below present information about the Company's assets and liabilities that are measured at fair value on a recurring basis as of September 30, 2021 and December 31, 2020 and indicate the fair value hierarchy of the valuation techniques utilized to determine such fair value.

Description	Fair value measurements at reporting date using			Balance as of September 30, 2021
	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	
Assets				
Cash equivalents:				
Money market funds	\$ 13,641	\$ —	\$ —	\$ 13,641
Short-term investments:				
U.S. government and agency securities	—	3,904	—	3,904
Total assets	<u>\$ 13,641</u>	<u>\$ 3,904</u>	<u>\$ —</u>	<u>\$ 17,545</u>

Description	Fair value measurements at reporting date using			Balance as of December 31, 2020
	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	
Assets				
Cash equivalents:				
Money market funds	\$ 2,873	\$ —	\$ —	\$ 2,873
Short-term investments:				
U.S. government and agency securities	—	6,279	—	6,279
Total assets	<u>\$ 2,873</u>	<u>\$ 6,279</u>	<u>\$ —</u>	<u>\$ 9,152</u>

There were no transfers of financial assets or liabilities between category levels during the three and nine months ended September 30, 2021 and the three and nine months ended September 30, 2020.

During November 2019, the Company issued Series A Warrants and Series B Warrants in two concurrent securities offerings that were considered free standing financial instruments, were legally detachable and separately exercisable from the common and preferred stock issued in the two offerings. The Company initially determined that all of the Series A Warrants and Series B Warrants should be classified as a warrant liability in accordance with ASC 480, *Distinguishing Liabilities from Equity*, and recognized at their inception date fair value due to the insufficiency of common shares available to permit their exercise. The warrant liability met Level 3 classification criteria for classification within the fair value hierarchy. On January 15, 2020, the Company filed an amendment to its Certificate of Incorporation with the State of Delaware to effect a 1-for-40 reverse stock split. As a result of the reverse stock split, the Company's number of authorized but unissued shares of Common Stock increased significantly and the Series A Warrants and Series B Warrants became eligible for exercise. Prior to reclassification as equity, on January 15, 2020, the Company adjusted the warrant liability to its then \$15,934 fair value using the Black-Scholes valuation model, recording a loss on the adjustment to fair value of \$957.

The following table shows a reconciliation of the beginning and ending balances for the Level 3 warrant liability for the nine months ending September 30, 2020.

	Nine Months Ended September 30, 2020
Warrant liability, December 31, 2019	\$ 14,977
Recognized loss from mark-to-market adjustment prior to reclassification of warrant liability to equity	957
Reclassification from warrant liability to equity	(15,934)
Warrant liability, September 30, 2020	<u>\$ —</u>

6. ACCRUED EXPENSES

Accrued expenses consisted of the following at:

	September 30, 2021	December 31, 2020
Employee compensation and benefits	\$ 504	\$ 620
Leased facilities	78	188
Professional services	210	235
Field trials and related expenses	191	52
Other	139	202
Total accrued expenses	<u>\$ 1,122</u>	<u>\$ 1,297</u>

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 \$436 and \$1,175 for the three and nine months ended September 30, 2021 and \$209 and \$506 for the three and nine months ended September 30, 2020, respectively. At September 30, 2021, there was approximately \$4,508 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 3.17 years.

Stock Options

A summary of option activity for the nine months ended September 30, 2021 is as follows:

	Number of Shares	Weighted Average Exercise Price
Outstanding at December 31, 2020	339,108	\$ 32.39
Granted	379,057	\$ 10.18
Exercised	—	\$ —
Forfeited	(1,509)	\$ 12.92
Expired	(37)	\$ 19,253.19
Outstanding at September 30, 2021	<u>716,619</u>	\$ 19.69
Options exercisable at September 30, 2021	168,961	\$ 53.07

In accordance with the terms of the Company's 2018 Stock Option and Incentive Plan ("2018 Stock Plan"), effective January 1, 2021, Yield10's Board of Directors approved the addition of 166,702 shares to the 2018 Stock Plan, which represented 5% of the Company's outstanding common stock on the day prior to the 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, 2021, 73,513 shares remain available to be awarded from the 2018 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 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, 2021, 17,932 employee RSUs vested, of which 5,713 common shares with a total market value of \$86 were withheld to pay employee tax withholding.

A summary of RSU activity for the nine months ended September 30, 2021 is as follows:

	Number of RSUs	Weighted Average Remaining Contractual Life (years)
Outstanding at December 31, 2020	8,500	
Awarded	18,862	
Common stock issued upon vesting	(17,932)	
Forfeited	—	
Outstanding at September 30, 2021	9,430	0.42

8. LEASES

Lease Accounting

As a lessee, the Company follows the lease accounting guidance codified in ASC 842. Under ASC 842, a lease is classified as a finance lease if any of five criteria described in the guidance apply to the lease. 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. The Company's existing lease subject to ASC 842 meets the standards for operating lease classification.

Under ASC 842, a lease liability is recorded on the commencement date of a lease and is calculated as the present value of the remaining lease payments, using the interest rate implicit in the lease, or if that rate is not readily determinable, using the lessee'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.

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, 2021, the Company's lease liability related to its Woburn facility will mature as follows:

Year ended December 31,	Undiscounted Cash Flows
2021 (October to December)	\$ 178
2022	726
2023	749
2024	771
2025	793
Thereafter	747
Total undiscounted future lease payments	3,964
Amount of lease payments representing interest	(682)
Total lease liabilities	\$ 3,282
Short-term lease liability	\$ 499
Long-term lease liability	\$ 2,783

Quantitative Disclosure of Lease Costs

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2021	2020	2021	2020
Lease cost:				
Operating lease cost	\$ 151	\$ 151	\$ 454	\$ 537
Short-term lease cost	171	167	497	473
Sublease income	(148)	(140)	(468)	(419)
Total lease cost, net	<u>\$ 174</u>	<u>\$ 178</u>	<u>\$ 483</u>	<u>\$ 591</u>

Other information as of:	September 30, 2021	December 31, 2020
Weighted-average remaining lease term (years)	5.2	5.9
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 buildup 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 sublease space was determined to be in excess of the Company's needs. 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 \$3,964 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.

Through May 2020, the Company leased approximately 13,702 square feet of office and laboratory space in Lowell, Massachusetts. The lease terminated in accordance with the terms of the lease agreement and the facility has been returned to the landlord. No further expenses are anticipated under this lease.

The Company's wholly-owned subsidiary, MOI, located in Saskatoon, Saskatchewan, Canada, leases approximately 7,733 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. MOI's leases for these facilities expire on various dates through September 2022.

9. CARES ACT LOAN

During April 2020, the Company received \$333 in loan proceeds through the Paycheck Protection Program Flexibility Act ("PPP"), established pursuant to the CARES Act. Under the CARES Act and the PPP, a borrower could apply for and be granted forgiveness for all or a part of its PPP loan. The amount of loan proceeds eligible for forgiveness was based on a formula that took into account a number of factors, including the amount of loan proceeds used by the borrower during the twenty-four-week period after the loan origination for certain purposes including payroll costs, rent payments on certain leases, and certain qualified utility payments. During the three months ended June 30, 2020, Yield10 utilized the entire PPP Loan amount for qualifying expenses and management of the Company considered it reasonably certain that it would meet the conditions for loan forgiveness. As such, the Company recorded the full amount of the loan, or \$333, within other income (expense) in its condensed consolidated statement of operations for the nine months ended September 30, 2020. The Company received a favorable determination to its application for loan forgiveness in November 2020 for the full amount of the loan.

10. COMMITMENTS AND CONTINGENCIES

Contractual Commitments

Exclusive Collaboration Agreement with Rothamsted Research ("Rothamsted")

On November 12, 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 DHA+EPA trait improvement, field testing and nutritional studies. The Company will pay Rothamsted quarterly research funding and option fees of \$31 for two years totaling \$250, of which \$156 remains outstanding as of September 30, 2021. As part of the agreement, the Company has an exclusive two-year option to sign a global, exclusive or non-exclusive license agreement to the technology. The current agreement terminates automatically on its second anniversary unless terminated earlier in accordance with the terms of the agreement.

License Agreement with the University of Massachusetts ("UMASS")

Pursuant to a license agreement with UMASS dated as of June 30, 2015 and subsequently amended, the Company has an exclusive, worldwide license under certain patents and patent applications, including issued patents covering the Company's yield trait gene C3003, relating to the manufacture of plants with enhanced photosynthesis. The agreement provides an exclusive, worldwide license to make, have made, use, offer for sale and import any transgenic plant seed or plant grown from transgenic plant material for sale to a farmer or grower that is derived from (in whole or in part) one or more issued or pending claims of the licensed patents or patent applications.

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

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

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.

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

The Company enters into indemnification provisions under various agreements with other companies in the ordinary course of business, typically with business partners and contractors. 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 Yield10 has not incurred material costs to defend lawsuits or settle claims related to these indemnification provisions. As a result, the estimated fair value of the indemnifications under these agreements is believed to be minimal. Accordingly, the Company has no liabilities recorded for these agreements as of September 30, 2021 and December 31, 2020.

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	Eliminations	Total
Three Months Ended September 30, 2021				
Grant revenue from external customers	\$ 92	\$ —	\$ —	\$ 92
Inter-geographic revenues	—	534	(534)	—
Revenues	<u>\$ 92</u>	<u>\$ 534</u>	<u>\$ (534)</u>	<u>\$ 92</u>
Three Months Ended September 30, 2020				
Grant revenue from external customers	\$ 204	\$ —	\$ —	\$ 204
Inter-geographic revenues	—	625	(625)	—
Revenues	<u>\$ 204</u>	<u>\$ 625</u>	<u>\$ (625)</u>	<u>\$ 204</u>
Nine Months Ended September 30, 2021				
Grant revenue from external customers	\$ 423	\$ 39	\$ —	\$ 462
Inter-geographic revenues	—	1,526	(1,526)	—
Revenues	<u>\$ 423</u>	<u>\$ 1,565</u>	<u>\$ (1,526)</u>	<u>\$ 462</u>
Nine Months Ended September 30, 2020				
Grant revenue from external customers	\$ 537	\$ 67	\$ —	\$ 604
Inter-geographic revenues	—	1,403	(1,403)	—
Revenues	<u>\$ 537</u>	<u>\$ 1,470</u>	<u>\$ (1,403)</u>	<u>\$ 604</u>

The geographic distribution of the Company's property and equipment is summarized as follows:

	U.S.	Canada	Eliminations	Total
September 30, 2021	\$ 850	\$ 53	\$ —	\$ 903
December 31, 2020	\$ 866	\$ 55	\$ —	\$ 921

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.

On August 26, 2020, the Company completed a public offering of 951,835 shares of its common stock at a public offering price of \$4.25 per share for total gross proceeds of \$4,045 before issuance costs of \$425.

Private Placement

Concurrent with the registered public offering completed on August 26, 2020, as described above, the Company completed a separate private placement offering of 396,450 shares of its common stock to certain existing shareholders at the same \$4.25 price offered to investors in the public offering. The proceeds from this private placement were \$1,685.

Reverse Stock Split

On January 15, 2020, the Company completed a 1-for-40 reverse stock split ("Reverse Stock Split") of its common stock by filing a certificate of amendment (the "Charter Amendment") with the State of Delaware to amend its certificate of incorporation. The ratio for the Reverse Stock Split was determined by the Company's board of directors following approval by stockholders at the Company's special meeting held on January 9, 2020. The Reverse Stock Split had the effect of increasing the Company's common shares available for issuance by reducing issued and outstanding common shares by a divisible factor of 40 while its authorized common shares remained at the current 60 million shares. Proportional adjustments were made to the Company's outstanding stock options and to the number of shares issued and issuable under the Company's equity compensation plans.

November 2019 Concurrent Securities Offerings

On November 19, 2019, the Company closed on concurrent public and private securities offerings that included the following: common stock, Series A Convertible Preferred Stock, Series B Convertible Preferred Stock, Series A Warrants and Series B Warrants. Combined cash proceeds from the offerings totaled \$11,500, before issuance costs of \$1,254.

As of the November 19, 2019 closing date of the two offerings, the Company did not have sufficient authorized and available shares of common stock to permit conversion of the Series B Convertible Preferred Stock sold in the private placement or to permit the exercise of the 2,875,000 combined Series A Warrants and Series B Warrants issued under both the public and the private offerings. The Series B Convertible Preferred Shares and the warrants were not convertible or exercisable until more shares of common stock became available for issuance through the Company's filing of the Charter Amendment for the Reverse Stock Split described above. Upon the filing of the amendment on January 15, 2020, all of the Series B Convertible Preferred Stock sold in the private placement automatically converted into 718,750 shares of common stock and the Series A Warrants and Series B Warrants issued in both offerings became eligible for exercise.

At the time of their issuance, the Company determined that all of the Series A Warrants and Series B Warrants should be classified as a warrant liability and recorded at an inception date fair value of \$24,518 due to the insufficiency of common shares available to permit their exercise. The Company re-measured the fair value of the warrants on December 31, 2019 and again on January 15, 2020 (the date of filing the Charter Amendment to increase available shares of common stock), resulting in, respectively, the recognition of a gain of \$9,541 followed by a loss of \$957, due to the change in fair value at each valuation date. By filing the Charter Amendment and effecting the 1-for-40 Reverse Stock Split, the Company's outstanding common shares were reduced by a divisible factor of 40 while authorized common shares remained at the current 60 million shares. As a result of this corporate action, sufficient shares of authorized, but unissued shares of common stock became available for Series A and Series B warrant holders to exercise their warrants resulting in their reclassification from warrant liability to equity on the date of filing the Charter Amendment.

Preferred Stock

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

Description of Series A Convertible Preferred Stock

The November 2019 public offering of the Company's securities included the issuance of 2,504 shares of Series A Convertible Preferred Stock. Each Series A Convertible Preferred Share was convertible into 125 shares of common stock at a conversion price of \$8.00 per share. All of the 2,504 shares of the Series A Convertible Preferred Stock converted to 313,000 shares of common stock by April 30, 2020.

Description of Series B Convertible Preferred Stock

The November 2019 private offering of the Company's securities included the issuance of 5,750 shares of Series B Convertible Preferred Stock. Each share of Series B Convertible Preferred Stock was convertible into 125 shares of common stock at a conversion price of \$8.00 per share. All of the Series B Convertible Preferred Stock converted automatically to 718,750 shares of common stock on January 15, 2020, upon the Company's filing of a Charter Amendment for the Reverse Stock Split described above.

When converted, the shares of Series A and B Convertible Preferred Stock were restored to the status of authorized but unissued shares of preferred stock, subject to reissuance by the Company's board of directors.

Warrants

The following table summarizes information regarding outstanding warrants to purchase common stock as of September 30, 2021:

Issuance	Number of Shares Issuable Upon Exercise of Outstanding Warrants	Exercise Price Per Share of Common Stock	Expiration Date
November 2019 Public Offering - Series A	352,703	\$ 8.00	May 19, 2022
November 2019 Public Offering - Series B	395,528	\$ 8.00	May 19, 2022
November 2019 Private Placement - Series A	718,750	\$ 8.00	May 19, 2022
November 2019 Private Placement - Series B	718,750	\$ 8.00	May 19, 2022
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	<u>2,361,726</u>		

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.

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, 2021	December 31, 2020
Stock Options	716,619	339,108
RSUs	9,430	8,500
Warrants	2,361,726	2,843,699
Total number of common shares reserved for future issuance	<u>3,087,775</u>	<u>3,191,307</u>

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; 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, 2020 and in our other filings with the SEC, including in Part II, Item 1A of this Report on Form 10-Q.

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. is an agricultural bioscience company that is using its differentiated trait gene discovery platform, (the “Trait Factory”), to develop improved Camelina varieties to produce proprietary products, and to produce other high value genetic traits for the agriculture and food industries. We are headquartered in Woburn, Massachusetts and have an Oilseed Center of Excellence in Saskatoon, Saskatchewan, Canada. Our goals are to efficiently develop and commercialize a high value crop products business by developing superior varieties of Camelina for the production of feedstock oils and meal, nutritional oils, and PHA bioplastics, and to license our yield traits to major seed companies for commercialization in major row crops, including corn, soybean and canola.

As of September 30, 2021, we held unrestricted cash, cash equivalents and investments of \$18,522. We follow the guidance of ASC Topic 205-40, *Presentation of Financial Statements-Going Concern*, in order to ascertain whether there is substantial doubt about our ability to continue as a going concern for one year after the date our financial statements are issued. Based on our current cash forecast, we expect that our present capital resources will be sufficient to fund our planned operations and meet our obligations, when due, into the second quarter of 2023. Our ability to continue operations after our current cash resources are exhausted depends on 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 adequate additional funds are not available when required, we may 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 in the future, (i) we may incur fees associated with such issuances, (ii) our existing stockholders may 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 due to ownership changes resulting from 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.

Government Grants

On February 26, 2021, MOI, 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 MOI during the period December 20, 2020 - March 13, 2021. During the first quarter of 2021, MOI 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 is being awarded on an annual basis with the first year commencing on September 15, 2017. Cumulative funding for this sub-award in the amount of \$2,957 has been appropriated by the U.S. Congress through the final contractual year ending in September 2022. During the three and nine months ended September 30, 2021, we recognized \$92 and \$423 in grant revenue, respectively, from the sub-award. During the three and nine months ended September 30, 2020, we recognized \$204 and \$537, respectively, from this sub-award.

As of September 30, 2021, proceeds of \$662 remain to be recognized through the end of the final contractual year under our MSU sub-award as shown in the table below. Included within this amount is \$108 in unused appropriations from the fourth year of the sub-award for which we are seeking approval to roll over into the final year of the contract. The remaining contractual funds includes 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, 2021	Remaining amount to be recognized as of September 30, 2021	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	\$ 2,295	\$ 662	September 2022
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	\$ 2,334	\$ 662	

Critical Accounting Estimates and Judgments

The discussion and analysis of our financial condition and results of operations are based upon our consolidated financial statements, which have been prepared in accordance with GAAP for interim financial information. The preparation of these 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 condensed consolidated financial statements for the three and nine months ended September 30, 2021, were consistent with those discussed in our [Annual Report on Form 10-K](#) for the year ended December 31, 2020, 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, 2021 and 2020

Revenue

	Three Months Ended September 30,		Change
	2021	2020	
Grant revenue	\$ 92	\$ 204	\$ (112)

Grant revenue was \$92 and \$204 for the three months ended September 30, 2021 and September 30, 2020, respectively. All of the grant revenue recorded during the three months ended September 30, 2021 and September 30, 2020 was derived from the Company's DOE sub-award with MSU.

We anticipate that grant revenue will decrease for the year ended December 31, 2021 in comparison to the year ended December 31, 2020 as a result of lower Canadian research grants awarded during 2021 by National Research Council Canada to our subsidiary, MOI, the varying annual budget appropriations awarded under our five-year MSU sub-award, and the timing and application of our internal resources to our grants. We currently cannot assess whether additional U.S. or Canadian government grants will be awarded to us during the remainder of 2021 or within the next twelve months. Our forecast related to grant revenue is subject to change, should we receive new grants or if our ability to earn revenue from our existing grant is negatively impacted by the COVID-19 pandemic.

Expenses

	Three Months Ended September 30,		Change
	2021	2020	
Research and development expenses	\$ 1,636	\$ 1,300	\$ 336
General and administrative expenses	1,547	1,098	449
Total expenses	\$ 3,183	\$ 2,398	\$ 785

Research and Development Expenses

Research and development expenses increased from \$1,300 during the three months ended September 30, 2020 to \$1,636 during the three months ended September 30, 2021. The \$336, or 26 percent increase, is primarily due to higher employee compensation, crop field trial and research services expenses. Employee compensation increased by \$156 from \$709 during the three months ended September 30, 2020 to \$865 during the three months ended September 30, 2021, and is primarily the result of a \$70 increase in stock-based compensation (a non-cash expense) related to employee stock awards issued during 2021 and a \$70 increase in payroll and benefit expenses due to annual employee compensation increases and our hiring of additional staff earlier this year. Crop trial expense increased by \$83 during the three months ended September 30, 2021 in comparison to the same quarter of the previous year and is the result of the Company's expanded Camelina field trials and related work being conducted in the U.S., Canada and Argentina. Expenses related to third-party research services, including DNA sequencing and analysis for regulatory purposes, also increased by \$51 during the three months ended September 30, 2021 in comparison to the third quarter of 2020.

Based on current planning and forecasting, we anticipate that our 2021 research and development expense will continue to remain at levels above expenses incurred during 2020 as we continue towards completion of our 2021 expanded crop trials and post-harvest analysis and as we continue to prepare our Camelina plant varieties for future commercial launch. Beyond 2021, we also anticipate incurring higher costs during the next twelve months as a result of hiring additional research staff in both the United States and Canada and as we continue to expand our testing of Camelina varieties in the field. Our forecast related to research and development expense is subject to change due to the potential impact of the COVID-19 pandemic, or as new collaborative and other business opportunities arise that alter our plans.

General and Administrative Expenses

General and administrative expenses for the three months ended September 30, 2021 and September 30, 2020 increased by \$449 from \$1,098 to \$1,547. The 41 percent increase is primarily due to increases in employee compensation and benefits, consulting and Camelina product development activities. Employee compensation expense increased by \$259 from \$453 during the three months ended September 30, 2020 to \$712 during the three months ended September 30, 2021, and is primarily the result of a \$158 increase in stock-based compensation expense related to stock awards issued during 2021 and a \$44 increase in payroll and benefit expenses from employee annual compensation increases that became effective the first of the year. During the three months ended September 30, 2021, we also recorded \$43 in recruiting fees in connection with our search for additional professional staff. Consulting fees increased by \$90 during three months ended September 30, 2021 in comparison to the same quarter of last year, primarily as a result of engaging outside parties to assist us with early stage business development efforts for our Camelina plant varieties. During the three months ended September 30, 2021, we also incurred \$55 in incremental product development costs related to Camelina seed bulk up and genetic analysis.

Based on current planning and budgeting, we anticipate that general and administrative expenses will continue to remain at levels above expenses incurred during 2020, primarily as a result of increased employee compensation and benefit expenses and our Camelina product development activities. We also anticipate higher costs during the next twelve months in connection with business development activities for our Camelina plant varieties. Our forecasts related to general and administrative expenses are subject to change due to the potential impact of the COVID-19 pandemic, or as new collaborative and other business opportunities arise that alter our plans.

Other Income (Expense), Net

	Three Months Ended September 30,		Change
	2021	2020	
Gain on investment in related party	\$ 700	—	700
Other income (expense), net	(1)	37	(38)
Total other income (expense), net	\$ 699	\$ 37	\$ 662

Gain on Investment in Related Party

During 1999, the Company entered into a sublicense agreement with Tephra, Inc. ("Tephra"), a privately held company engaged in the development of medical products. At the time the sublicense was executed, a director of Yield10 was also the president, chief executive officer and a director of Tephra. Three other members of Yield10's board of directors also served on the board of directors of Tephra, of which one continued to serve until completion of the sale discussed below. Yield10 received 648,149 shares of Series A Convertible Preferred Stock of Tephra ("Tephra Shares") during 2002 as consideration for outstanding license payments due to Yield10 totaling \$700. During 2005, the Company determined the value of the Tephra Shares was impaired resulting in their write off through a charge to other income (expense). The sublicense agreement with Tephra ended in 2016.

In May 2021, the board of directors of Tephra approved and authorized the sale of Tephra to Becton Dickinson Global Holdings, Inc. ("Becton Dickinson"). On July 26, 2021, Yield10 received cash consideration of \$700 in exchange for the surrender of its Tephra Shares upon the closing of the sale of Tephra to Becton Dickinson.

Other Income (Expense), net

Other income (expense) for the three months ended September 30, 2020 was 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. No investment income was recorded for the three months ended September 30, 2021 due to the negligible yield currently available with short-term U.S. federal treasury notes.

Comparison of the Nine Months Ended September 30, 2021 and 2020

Revenue

	Nine Months Ended September 30,		Change
	2021	2020	
Grant revenue	\$ 462	\$ 604	\$ (142)

Grant revenue was \$462 and \$604 for the nine months ended September 30, 2021 and September 30, 2020, respectively. During the nine months ended September 30, 2021 and September 30, 2020, we recognized \$423 and \$537, respectively, from the Company's DOE sub-award with MSU and \$39 and \$67, respectively, from short-term research grants awarded to MOI through the Canadian Industrial Research Assistance Program.

Expenses

	Nine Months Ended September 30,		Change
	2021	2020	
Research and development expenses	\$ 4,603	\$ 3,939	\$ 664
General and administrative expenses	4,583	3,664	919
Total expenses	\$ 9,186	\$ 7,603	\$ 1,583

Research and Development Expenses

Research and development expense increased from \$3,939 during the nine months ended September 30, 2020 to \$4,603 during the nine months ended September 30, 2021. The \$664, or 17 percent increase, is primarily due to higher employee compensation and crop field trial expenses of \$453 and \$223, respectively. The increase in employee compensation expense is the result of a \$221 increase in stock-based compensation expense, a \$127 increase in employee payroll and benefits due to employee annual compensation increases and expenses related to our hiring additional staff earlier this year. The increase in crop field trial expense during the nine months ended September 30, 2021 in comparison to the same period in 2020, is the result of the Company's expanded Camelina field trials and related work being conducted in the U.S., Canada and Argentina.

General and Administrative Expenses

General and administrative expenses increased by \$919 from \$3,664 during the nine months ended September 30, 2020 to \$4,583 for the nine months ended September 30, 2021. The 25 percent increase is primarily due to an increase in employee compensation expense of \$647, including an increase in stock-based compensation of \$447, and an increase in recruiting expenses of \$86. Consulting fees also increased by \$220 during the nine months ended September 30, 2021 in comparison to the nine months ended September 30, 2020, and are primarily a result of engaging outside parties to assist us with early stage business development activities for our Camelina plant varieties. Our investor relations expense also increased by \$72 during the nine months ended September 30, 2021 in comparison to the nine months ended September 30, 2020 and is primarily due to costs associated with our efforts to communicate the Company's strategic direction.

Other Income (Expense), Net

	Nine Months Ended September 30,		Change
	2021	2020	
Change in fair value of warrants	\$ —	\$ (957)	\$ 957
Loan forgiveness income	—	333	(333)
Gain on investment in related party	700	—	700
Other income (expense), net	(2)	85	(87)
Total other income (expense), net	698	(539)	\$ 1,237

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 was approved by the FTC on July 21, 2021 and Yield10 received cash consideration of \$700 for the surrender of its Tepha Shares when the merger closed on July 26, 2021.

Change in Fair Value of Warrants

The fair value of the liability classified warrants issued in our November 2019 securities offerings was subject to mark-to-market adjustment on subsequent balance sheet dates. On January 15, 2020, we remeasured the fair value of the warrant liability in connection with the Company's 1-for-40 reverse stock split, recording a loss from the change in fair value of \$957. The reverse stock split increased the number of shares of common stock available for issuance resulting in reclassification of the warrant liability to equity.

Loan Forgiveness Income

During April 2020, we received \$333 in loan proceeds through the Paycheck Protection Program Flexibility Act ("PPP"), established pursuant to the CARES Act. During our fiscal quarter ended September 30, 2020 we utilized the entire PPP Loan amount for expenses that met the qualifications for loan forgiveness and recorded the full amount of the loan within other income (expense) within our condensed consolidated statement of operations.

Other Income (Expense), net

Other income (expense) for the nine months ended September 30, 2021 and September 30, 2020 was 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. Investment income recorded from U.S. federal treasury notes was negligible during the nine months ended September 30, 2021 due to their insignificant yield rates.

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, 2021. As of September 30, 2021, we had an accumulated deficit of \$383,151. Our unrestricted cash, cash equivalents and investments are held primarily for working capital purposes and as of September 30, 2021, totaled \$18,522 compared to cash, cash equivalents and investments of \$9,702 at December 31, 2020. As of September 30, 2021, 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, 2021, we continued to have no outstanding debt.

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, 2021, we were in compliance with this policy.

We anticipate net cash usage during 2021 within a range of \$10,000 to \$10,500 and estimate that our current cash resources will be sufficient to fund operations and meet our obligations, when due, into the second quarter of 2023. 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 issued. Based on our cash forecast, we expect that our present capital resources will be sufficient to fund our planned operations for at least that period of time. 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

adequate additional funds are not available when required, we may 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.

On March 28, 2021, we filed a shelf registration statement on Form S-3 (File No. 333-254830) with the SEC, which was declared effective on April 2, 2021 (the "Shelf Registration Statement"). The Shelf Registration Statement contained a prospectus which covers the offering, issuance and sale by the Company of up to a maximum aggregate offering price of \$100,000 of our common stock, preferred stock, warrants and subscription rights, which securities may be sold either individually or in units.

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 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.

Net cash used for operating activities during the nine months ended September 30, 2021 was \$6,768, compared to net cash used for operating activities during the nine months ended September 30, 2020 of \$6,670. Net cash used for operating activities during the nine months ended September 30, 2021 primarily reflects the net loss of \$8,051, cash payments made to reduce the Company's lease liabilities of \$338 and our payment of 2020 bonus compensation of \$460 during early 2021. Non-cash charges offsetting a portion of the net loss include depreciation and amortization expense of \$165, the Company's 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 used for operating activities during the nine months ended September 30, 2020 was \$6,670 and primarily reflects the net loss of \$7,564 and cash payments made to reduce the Company's lease liabilities and to pay 2019 bonus compensation of \$495 and \$344, respectively. Non-cash expenses included in the net loss, included depreciation and amortization expense of \$137, the loss recorded from the revaluation of our warrant liability of \$957, losses from the disposal of fixed assets of \$206, stock-based compensation expense of \$506, and non-cash lease expense of \$345.

Net cash of \$2,229 was provided by investing activities during the nine months ended September 30, 2021, primarily as a result of our receiving proceeds of \$6,250 from investments reaching maturity and converting into cash, partially offset by our purchase of \$3,874 in new investments. During the nine months ended September 30, 2021, we also purchased \$147 in laboratory and other equipment, including new plant growth chambers. During the nine months ended September 30, 2020, \$3,125 in net cash was provided from investing activities and was primarily the net result of our purchase of \$6,290 in new investments partially offset by cash proceeds of \$3,197 from maturing investments.

Net cash of \$15,746 was provided by financing activities during the nine months ended September 30, 2021, compared to net cash of \$7,341 provided by financing activities during the nine months ended September 30, 2020. During the nine months ended September 30, 2021, the Company completed a public offering of 1,040,000 shares of its common stock at a price of \$12.25 per share, receiving proceeds of \$11,993 net of 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 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, 2020, we recorded cash proceeds of \$1,658 from the exercise of 207,296 warrants. In addition, on August 26, 2020, we completed a public offering of 951,835 shares of our common stock at a public offering price of \$4.25 per share, for gross proceeds of \$4,045 before issuance costs of \$425. Included in these issuance costs was \$63 in outstanding costs that remained unpaid as of September 30, 2020. Also on August 26, 2020, we completed a separate but concurrent private placement offering of 396,450 shares of our common stock to certain existing shareholders at the same \$4.25 price as the public offering noted above. The gross proceeds of this private placement were \$1,685.

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, 2021. 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, 2021 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, 2020, filed with the SEC on March 16, 2021.

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

Recent Sales of Unregistered Securities

On July 1, 2021, we issued 2,857 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 amended as exempted securities.

Issuer Purchases of Equity Securities

During the three months ended September 30, 2021, 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.

- [3.1](#) Amended and Restated By-Laws, as amended, of the Registrant (filed herewith).
- [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).
- 101.1 The following financial information from the Yield10 Bioscience, Inc. Quarterly Report on Form 10-Q for the quarter ended September 30, 2021 formatted in XBRL: (i) Condensed Consolidated Balance Sheets, September 30, 2021 and December 31, 2020; (ii) Condensed Consolidated Statements of Operations, Three and Nine Months Ended September 30, 2021 and 2020; (iii) Condensed Consolidated Statements of Comprehensive Loss, Three and Nine Months Ended September 30, 2021 and 2020; (iv) Condensed Consolidated Statements of Cash Flows, Nine Months Ended September 30, 2021 and 2020; (v) Condensed Consolidated Statements of Series B Convertible Preferred Stock and Stockholders' Equity, Three and Nine Months Ended September 30, 2021 and 2020; and (vi) Notes to Consolidated Financial Statements.

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 10, 2021

By: /s/ OLIVER PEOPLES

Oliver Peoples
President and Chief Executive Officer
(Principal Executive Officer)

November 10, 2021

By: /s/ CHARLES B. HAASER

Charles B. Haaser
Chief Accounting Officer
(Principal Financial and Accounting Officer)

AMENDED AND RESTATED**BY-LAWS****OF****YIELD10 BIOSCIENCE, INC.**

(the "Corporation")

ARTICLE I**Stockholders**

SECTION 1. Annual Meeting. The annual meeting of stockholders (any such meeting being referred to in these By-laws as an "Annual Meeting") shall be held at the hour, date and place within or without the United States which is fixed by the Board of Directors, which time, date and place may subsequently be changed at any time by vote of the Board of Directors. If no Annual Meeting has been held for a period of thirteen months after the Corporation's last Annual Meeting, a special meeting in lieu thereof may be held, and such special meeting shall have, for the purposes of these By-laws or otherwise, all the force and effect of an Annual Meeting. Any and all references hereafter in these By-laws to an Annual Meeting or Annual Meetings also shall be deemed to refer to any special meeting(s) in lieu thereof.

SECTION 2. Notice of Stockholder Business and Nominations.**(a) Annual Meetings of Stockholders.**

(1) Nominations of persons for election to the Board of Directors of the Corporation and the proposal of business to be considered by the stockholders may be made at an Annual Meeting (a) pursuant to the Corporation's notice of meeting, (b) by or at the direction of the Board of Directors or (c) by any stockholder of the Corporation who was a stockholder of record at the time of giving of notice provided for in this By-law, who is entitled to vote at the meeting, who is present (in person or by proxy) at the meeting and who complies with the notice procedures set forth in this By-law. In addition to the other requirements set forth in this By-law, for any proposal of business to be considered at an Annual Meeting, it must be a proper subject for action by stockholders of the Corporation under Delaware law.

(2) For nominations or other business to be properly brought before an Annual Meeting by a stockholder pursuant to clause (c) of paragraph (a)(1) of this By-law, the stockholder must have given timely notice thereof in writing to the Secretary of the Corporation. To be timely, a stockholder's notice shall be delivered to the Secretary at the principal executive offices of the Corporation not later than the close of business on the 90th day nor earlier than the close of business on the 120th day prior to the first anniversary of the preceding year's Annual Meeting; provided, however, that in the event

that the date of the Annual Meeting is advanced by more than 30 days before or delayed by more than 60 days after such anniversary date, notice by the stockholder to be timely must be so delivered not earlier than the close of business on the 120th day prior to such Annual Meeting and not later than the close of business on the later of the 90th day prior to such Annual Meeting or the 10th day following the day on which public announcement of the date of such meeting is first made. Notwithstanding anything to the contrary provided herein, for the first Annual Meeting following the initial public offering of common stock of the Corporation, a stockholder's notice shall be timely if delivered to the Secretary at the principal executive offices of the Corporation not later than the close of business on the later of the 90th day prior to the scheduled date of such Annual Meeting or the 10th day following the day on which public announcement of the date of such Annual Meeting is first made or sent by the Corporation. Such stockholder's notice shall set forth (a) as to each person whom the stockholder proposes to nominate for election or reelection as a director, all information relating to such person that is required to be disclosed in solicitations of proxies for election of directors in an election contest, or is otherwise required, in each case pursuant to Regulation 14A under the Securities Exchange Act of 1934, as amended (the "Exchange Act") (including such person's written consent to being named in the proxy statement as a nominee and to serving as a director if elected); (b) as to any other business that the stockholder proposes to bring before the meeting, a brief description of the business desired to be brought before the meeting, the reasons for conducting such business at the meeting, any material interest in such business of such stockholder and the beneficial owner, if any, on whose behalf the proposal is made, and the names and addresses of other stockholders known by the stockholder proposing such business to support such proposal, and the class and number of shares of the Corporation's capital stock beneficially owned by such other stockholders; and (c) as to the stockholder giving the notice and the beneficial owner, if any, on whose behalf the nomination or proposal is made (i) the name and address of such stockholder, as they appear on the Corporation's books, and of such beneficial owner, and (ii) the class and number of shares of the Corporation which are owned beneficially and of record by such stockholder and such beneficial owner.

(3) Notwithstanding anything in the second sentence of paragraph (a)(2) of this By-law to the contrary, in the event that the number of directors to be elected to the Board of Directors of the Corporation is increased and there is no public announcement naming all of the nominees for director or specifying the size of the increased Board of Directors made by the Corporation at least 85 days prior to the first anniversary of the preceding year's Annual Meeting, a stockholder's notice required by this By-law shall also be considered timely, but only with respect to nominees for any new positions created by such increase, if it shall be delivered to the Secretary at the principal executive offices of the Corporation not later than the close of business on the 10th day following the day on which such public announcement is first made by the Corporation.

(b) General.

(1) Only such persons who are nominated in accordance with the provisions of this By-law shall be eligible for election and to serve as directors and only such business shall be conducted at an Annual Meeting as shall have been brought before the

meeting in accordance with the provisions of this By-law. The Board of Directors or a designated committee thereof shall have the power to determine whether a nomination or any business proposed to be brought before the meeting was made in accordance with the provisions of this By-law. If neither the Board of Directors nor such designated committee makes a determination as to whether any stockholder proposal or nomination was made in accordance with the provisions of this By-law, the presiding officer of the Annual Meeting shall have the power and duty to determine whether the stockholder proposal or nomination was made in accordance with the provisions of this By-law. If the Board of Directors or a designated committee thereof or the presiding officer, as applicable, determines that any stockholder proposal or nomination was not made in accordance with the provisions of this By-law, such proposal or nomination shall be disregarded and shall not be presented for action at the Annual Meeting.

(2) For purposes of this By-law, “public announcement” shall mean disclosure in a press release reported by the Dow Jones News Service, Associated Press or comparable national news service or in a document publicly filed by the Corporation with the Securities and Exchange Commission pursuant to Section 13, 14 or 15(d) of the Exchange Act.

(3) Notwithstanding the foregoing provisions of this By-law, a stockholder shall also comply with all applicable requirements of the Exchange Act and the rules and regulations thereunder with respect to the matters set forth in this By-law. Nothing in this By-law shall be deemed to affect any rights of (i) stockholders to request inclusion of proposals in the Corporation’s proxy statement pursuant to Rule 14a-8 under the Exchange Act or (ii) the holders of any series of Undesignated Preferred Stock to elect directors under specified circumstances.

SECTION 3. Special Meetings. Except as otherwise required by statute and subject to the rights, if any, of the holders of any series of Undesignated Preferred Stock, special meetings of the stockholders of the Corporation may be called only by the Board of Directors acting pursuant to a resolution approved by the affirmative vote of a majority of the Directors then in office. Only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders of the Corporation.

SECTION 4. Notice of Meetings; Adjournments. A notice of each Annual Meeting stating the hour, date and place, if any, of such Annual Meeting shall be given not less than ten (10) days nor more than sixty (60) days before the Annual Meeting, to each stockholder entitled to vote thereat by delivering such notice to such stockholder or by mailing it, postage prepaid, addressed to such stockholder at the address of such stockholder as it appears on the Corporation’s stock transfer books.

Notice of all special meetings of stockholders shall be given in the same manner as provided for Annual Meetings, except that the notice of all special meetings shall state the purpose or purposes for which the meeting has been called.

Notice of an Annual Meeting or special meeting of stockholders need not be given to a stockholder if a waiver of notice is executed before or after such meeting by such stockholder or

if such stockholder attends such meeting, unless such attendance was for the express purpose of objecting at the beginning of the meeting to the transaction of any business because the meeting was not lawfully called or convened.

The Board of Directors may postpone and reschedule any previously scheduled Annual Meeting or special meeting of stockholders and any record date with respect thereto, regardless of whether any notice or public disclosure with respect to any such meeting has been sent or made pursuant to Section 2 of this Article I of these By-laws or otherwise. In no event shall the public announcement of an adjournment, postponement or rescheduling of any previously scheduled meeting of stockholders commence a new time period for the giving of a stockholder's notice under Section 2 of this Article I of these By-laws.

When any meeting is convened, the presiding officer may adjourn the meeting if (a) no quorum is present for the transaction of business, (b) the Board of Directors determines that adjournment is necessary or appropriate to enable the stockholders to consider fully information which the Board of Directors determines has not been made sufficiently or timely available to stockholders, or (c) the Board of Directors determines that adjournment is otherwise in the best interests of the Corporation. When any Annual Meeting or special meeting of stockholders is adjourned to another hour, date or place, notice need not be given of the adjourned meeting other than an announcement at the meeting at which the adjournment is taken of the hour, date and place, if any, to which the meeting is adjourned and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such adjourned meeting; provided, however, that if the adjournment is for more than 30 days, or if after the adjournment a new record date is fixed for the adjourned meeting, notice of the adjourned meeting and the means of remote communications, if any, by which stockholders and proxyholders may be deemed to be present in person and vote at such adjourned meeting shall be given to each stockholder of record entitled to vote thereat and each stockholder who, by law or under the Certificate of Incorporation of the Corporation (as the same may hereafter be amended and/or restated, the "Certificate") or these By-laws, is entitled to such notice.

SECTION 5. Quorum. A majority of the shares entitled to vote, present in person or represented by proxy, shall constitute a quorum at any meeting of stockholders. If less than a quorum is present at a meeting, the holders of voting stock representing a majority of the voting power present at the meeting or the presiding officer may adjourn the meeting from time to time, and the meeting may be held as adjourned without further notice, except as provided in Section 5 of this Article I. At such adjourned meeting at which a quorum is present, any business may be transacted which might have been transacted at the meeting as originally noticed. The stockholders present at a duly constituted meeting may continue to transact business until adjournment, notwithstanding the withdrawal of enough stockholders to leave less than a quorum.

SECTION 6. Voting and Proxies. Stockholders shall have one vote for each share of stock entitled to vote owned by them of record according to the stock ledger of the Corporation, unless otherwise provided by law or by the Certificate. Stockholders may vote either (i) in person, (ii) by written proxy or (iii) by a transmission permitted by §212(c) of the Delaware General Corporation Law ("DGCL"). Any copy, facsimile telecommunication or other reliable reproduction of the writing or transmission permitted by §212(c) of the DGCL may be

substituted for or used in lieu of the original writing or transmission for any and all purposes for which the original writing or transmission could be used, provided that such copy, facsimile telecommunication or other reproduction shall be a complete reproduction of the entire original writing or transmission. Proxies shall be filed in accordance with the procedures established for the meeting of stockholders. Except as otherwise limited therein or as otherwise provided by law, proxies authorizing a person to vote at a specific meeting shall entitle the persons authorized thereby to vote at any adjournment of such meeting, but they shall not be valid after final adjournment of such meeting. A proxy with respect to stock held in the name of two or more persons shall be valid if executed by or on behalf of any one of them unless at or prior to the exercise of the proxy the Corporation receives a specific written notice to the contrary from any one of them.

SECTION 7. Action at Meeting. When a quorum is present at any meeting of stockholders, any matter before any such meeting (other than an election of a director or directors) shall be decided by a majority of the votes properly cast for and against such matter, except where a larger vote is required by law, by the Certificate or by these By-laws. Any election of directors by stockholders shall be determined by a plurality of the votes properly cast on the election of directors. The Corporation shall not directly or indirectly vote any shares of its own stock; provided, however, that the Corporation may vote shares which it holds in a fiduciary capacity to the extent permitted by law.

SECTION 8. Stockholder Lists. The Secretary or an Assistant Secretary (or the Corporation's transfer agent or other person authorized by these By-laws or by law) shall prepare and make, at least 10 days before every Annual Meeting or special meeting of stockholders, a complete list of the stockholders entitled to vote at the meeting, arranged in alphabetical order, and showing the address of each stockholder and the number of shares registered in the name of each stockholder. Such list shall be open to the examination of any stockholder, for a period of at least ten (10) days prior to the meeting in the manner provided by law. The list shall also be open to the examination of any stockholder during the whole time of the meeting as provided by law.

SECTION 9. Presiding Officer. The Chairman of the Board, if one is elected, or if not elected or in his or her absence, the President, shall preside at all Annual Meetings or special meetings of stockholders and shall have the power, among other things, to adjourn such meeting at any time and from time to time, subject to Sections 5 and 6 of this Article I. The order of business and all other matters of procedure at any meeting of the stockholders shall be determined by the presiding officer.

SECTION 10. Inspectors of Elections. The Corporation shall, in advance of any meeting of stockholders, appoint one or more inspectors to act at the meeting and make a written report thereof. The Corporation may designate one or more persons as alternate inspectors to replace any inspector who fails to act. If no inspector or alternate is able to act at a meeting of stockholders, the presiding officer shall appoint one or more inspectors to act at the meeting. Any inspector may, but need not, be an officer, employee or agent of the Corporation. Each inspector, before entering upon the discharge of his or her duties, shall take and sign an oath faithfully to execute the duties of inspector with strict impartiality and according to the best of his or her ability. The inspectors shall perform such duties as are required by the DGCL,

including the counting of all votes and ballots. The inspectors may appoint or retain other persons or entities to assist the inspectors in the performance of the duties of the inspectors. The presiding officer may review all determinations made by the inspectors, and in so doing the presiding officer shall be entitled to exercise his or her sole judgment and discretion and he or she shall not be bound by any determinations made by the inspectors. All determinations by the inspectors and, if applicable, the presiding officer, shall be subject to further review by any court of competent jurisdiction.

ARTICLE II

Directors

SECTION 1. Powers. The business and affairs of the Corporation shall be managed by or under the direction of the Board of Directors except as otherwise provided by the Certificate or required by law.

SECTION 2. Number and Terms. The number of directors of the Corporation shall be fixed solely and exclusively by resolution duly adopted from time to time by the Board of Directors. The directors shall hold office in the manner provided in the Certificate.

SECTION 3. Qualification. No director need be a stockholder of the Corporation.

SECTION 4. Vacancies. Vacancies in the Board of Directors shall be filled in the manner provided in the Certificate.

SECTION 5. Removal. Directors may be removed from office in the manner provided in the Certificate.

SECTION 6. Resignation. A director may resign at any time by giving written notice to the Chairman of the Board, if one is elected, the President or the Secretary. A resignation shall be effective upon receipt, unless the resignation otherwise provides.

SECTION 7. Regular Meetings. The regular annual meeting of the Board of Directors shall be held, without notice other than this Section 7, on the same date and at the same place as the Annual Meeting following the close of such meeting of stockholders. Other regular meetings of the Board of Directors may be held at such hour, date and place as the Board of Directors may by resolution from time to time determine and publicize by means of reasonable notice given to any director who is not present at the meeting at which such resolution is adopted.

SECTION 8. Special Meetings. Special meetings of the Board of Directors may be called, orally or in writing, by or at the request of a majority of the directors, the Chairman of the Board, if one is elected, or the President. The person calling any such special meeting of the Board of Directors may fix the hour, date and place thereof.

SECTION 9. Notice of Meetings. Notice of the hour, date and place of all special meetings of the Board of Directors shall be given to each director by the Secretary or an Assistant Secretary, or in case of the death, absence, incapacity or refusal of such persons, by the Chairman of the Board, if one is elected, or the President or such other officer designated by the

Chairman of the Board, if one is elected, or the President. Notice of any special meeting of the Board of Directors shall be given to each director in person, by telephone, or by facsimile, electronic mail or other form of electronic communication, sent to his or her business or home address, at least 24 hours in advance of the meeting, or by written notice mailed to his or her business or home address, at least 48 hours in advance of the meeting. Such notice shall be deemed to be delivered when hand delivered to such address, read to such director by telephone, deposited in the mail so addressed, with postage thereon prepaid if mailed, dispatched or transmitted if faxed, telexed or telecopied, or when delivered to the telegraph company if sent by telegram.

A written waiver of notice signed before or after a meeting by a director and filed with the records of the meeting shall be deemed to be equivalent to notice of the meeting. The attendance of a director at a meeting shall constitute a waiver of notice of such meeting, except where a director attends a meeting for the express purpose of objecting at the beginning of the meeting to the transaction of any business because such meeting is not lawfully called or convened. Except as otherwise required by law, by the Certificate or by these By-laws, neither the business to be transacted at, nor the purpose of, any meeting of the Board of Directors need be specified in the notice or waiver of notice of such meeting.

SECTION 10. Quorum. At any meeting of the Board of Directors, a majority of the total number of directors shall constitute a quorum for the transaction of business, but if less than a quorum is present at a meeting, a majority of the directors present may adjourn the meeting from time to time, and the meeting may be held as adjourned without further notice, except as provided in Section 9 of this Article II. Any business which might have been transacted at the meeting as originally noticed may be transacted at such adjourned meeting at which a quorum is present. For purposes of this section, the total number of directors includes any unfilled vacancies on the Board of Directors.

SECTION 11. Action at Meeting. At any meeting of the Board of Directors at which a quorum is present, the vote of a majority of the directors present shall constitute action by the Board of Directors, unless otherwise required by law, by the Certificate or by these By-laws.

SECTION 12. Action by Consent. Any action required or permitted to be taken at any meeting of the Board of Directors may be taken without a meeting if all members of the Board of Directors consent thereto in writing or by electronic transmission and the writing or writings or electronic transmission or transmissions are filed with the records of the meetings of the Board of Directors. Such filing shall be in paper form if the minutes are maintained in paper form and shall be in electronic form if the minutes are maintained in electronic form. Such consent shall be treated as a resolution of the Board of Directors for all purposes.

SECTION 13. Manner of Participation. Directors may participate in meetings of the Board of Directors by means of conference telephone or other communications equipment by means of which all directors participating in the meeting can hear each other, and participation in a meeting in accordance herewith shall constitute presence in person at such meeting for purposes of these By-laws.

SECTION 14. Committees. The Board of Directors, by vote of a majority of the directors then in office, may elect from its number one or more committees, including, without limitation, an Executive Committee, a Compensation Committee, a Stock Option Committee and an Audit Committee, and may delegate thereto some or all of its powers except those which by law, by the Certificate or by these By-laws may not be delegated. Except as the Board of Directors may otherwise determine, any such committee may make rules for the conduct of its business, but unless otherwise provided by the Board of Directors or in such rules, its business shall be conducted so far as possible in the same manner as is provided by these By-laws for the Board of Directors. All members of such committees shall hold such offices at the pleasure of the Board of Directors. The Board of Directors may abolish any such committee at any time. Any committee to which the Board of Directors delegates any of its powers or duties shall keep records of its meetings and shall report its action to the Board of Directors.

SECTION 14. Compensation of Directors. Directors shall receive such compensation for their services as shall be determined by a majority of the Board of Directors, or a designated committee thereof, provided that directors who are serving the Corporation as employees and who receive compensation for their services as such, shall not receive any salary or other compensation for their services as directors of the Corporation.

ARTICLE III

Officers

SECTION 1. Enumeration. The officers of the Corporation shall consist of a President, a Treasurer, a Secretary and such other officers, including, without limitation, a Chairman of the Board of Directors, a Chief Executive Officer and one or more Vice Presidents (including Executive Vice Presidents or Senior Vice Presidents), Assistant Vice Presidents, Assistant Treasurers and Assistant Secretaries, as the Board of Directors may determine.

SECTION 2. Election. At the regular annual meeting of the Board of Directors following the Annual Meeting, the Board of Directors shall elect the President, the Treasurer and the Secretary. Other officers may be elected by the Board of Directors at such regular annual meeting of the Board of Directors or at any other regular or special meeting.

SECTION 3. Qualification. No officer need be a stockholder or a director. Any person may occupy more than one office of the Corporation at any time. Any officer may be required by the Board of Directors to give bond for the faithful performance of his or her duties in such amount and with such sureties as the Board of Directors may determine.

SECTION 4. Tenure. Except as otherwise provided by the Certificate or by these By-laws, each of the officers of the Corporation shall hold office until the regular annual meeting of the Board of Directors following the next Annual Meeting and until his or her successor is elected and qualified or until his or her earlier resignation or removal.

SECTION 5. Resignation. Any officer may resign by delivering his or her written resignation to the Corporation addressed to the President or the Secretary, and such resignation shall be effective upon receipt unless it is specified to be effective at some other time or upon the happening of some other event.

SECTION 6. Removal. Except as otherwise provided by law, the Board of Directors may remove any officer with or without cause by the affirmative vote of a majority of the directors then in office.

SECTION 7. Absence or Disability. In the event of the absence or disability of any officer, the Board of Directors may designate another officer to act temporarily in place of such absent or disabled officer.

SECTION 8. Vacancies. Any vacancy in any office may be filled for the unexpired portion of the term by the Board of Directors.

SECTION 9. President. The President shall, subject to the direction of the Board of Directors, have general supervision and control of the Corporation's business. If there is no Chairman of the Board or if he or she is absent, the President shall preside, when present, at all meetings of stockholders and of the Board of Directors. The President shall have such other powers and perform such other duties as the Board of Directors may from time to time designate.

SECTION 10. Chairman of the Board. The Chairman of the Board, if one is elected, shall preside, when present, at all meetings of the stockholders and of the Board of Directors. The Chairman of the Board shall have such other powers and shall perform such other duties as the Board of Directors may from time to time designate.

SECTION 11. Chief Executive Officer. The Chief Executive Officer, if one is elected, shall have such powers and shall perform such duties as the Board of Directors may from time to time designate.

SECTION 12. Vice Presidents and Assistant Vice Presidents. Any Vice President (including any Executive Vice President or Senior Vice President) and any Assistant Vice President shall have such powers and shall perform such duties as the Board of Directors or the Chief Executive Officer may from time to time designate.

SECTION 13. Treasurer and Assistant Treasurers. The Treasurer shall, subject to the direction of the Board of Directors and except as the Board of Directors or the Chief Executive Officer may otherwise provide, have general charge of the financial affairs of the Corporation and shall cause to be kept accurate books of account. The Treasurer shall have custody of all funds, securities, and valuable documents of the Corporation. He or she shall have such other duties and powers as may be designated from time to time by the Board of Directors or the Chief Executive Officer.

Any Assistant Treasurer shall have such powers and perform such duties as the Board of Directors or the Chief Executive Officer may from time to time designate.

SECTION 14. Secretary and Assistant Secretaries. The Secretary shall record all the proceedings of the meetings of the stockholders and the Board of Directors (including committees of the Board) in books kept for that purpose. In his or her absence from any such meeting, a temporary secretary chosen at the meeting shall record the proceedings thereof. The Secretary shall have charge of the stock ledger (which may, however, be kept by any transfer or other agent of the Corporation). The Secretary shall have custody of the seal of the Corporation,

and the Secretary, or an Assistant Secretary, shall have authority to affix it to any instrument requiring it, and, when so affixed, the seal may be attested by his or her signature or that of an Assistant Secretary. The Secretary shall have such other duties and powers as may be designated from time to time by the Board of Directors or the Chief Executive Officer. In the absence of the Secretary, any Assistant Secretary may perform his or her duties and responsibilities.

Any Assistant Secretary shall have such powers and perform such duties as the Board of Directors or the Chief Executive Officer may from time to time designate.

SECTION 15. Other Powers and Duties. Subject to these By-laws and to such limitations as the Board of Directors may from time to time prescribe, the officers of the Corporation shall each have such powers and duties as generally pertain to their respective offices, as well as such powers and duties as from time to time may be conferred by the Board of Directors or the Chief Executive Officer.

ARTICLE IV

Capital Stock

SECTION 1. Certificates of Stock. Each stockholder shall be entitled to a certificate of the capital stock of the Corporation in such form as may from time to time be prescribed by the Board of Directors. Such certificate shall be signed by the Chairman of the Board of Directors, the President or a Vice President and by the Treasurer or an Assistant Treasurer, or the Secretary or an Assistant Secretary. The Corporation seal and the signatures by the Corporation's officers, the transfer agent or the registrar may be facsimiles. In case any officer, transfer agent or registrar who has signed or whose facsimile signature has been placed on such certificate shall have ceased to be such officer, transfer agent or registrar before such certificate is issued, it may be issued by the Corporation with the same effect as if he or she were such officer, transfer agent or registrar at the time of its issue. Every certificate for shares of stock which are subject to any restriction on transfer and every certificate issued when the Corporation is authorized to issue more than one class or series of stock shall contain such legend with respect thereto as is required by law.

SECTION 2. Transfers. Subject to any restrictions on transfer and unless otherwise provided by the Board of Directors, shares of stock may be transferred only on the books of the Corporation by the surrender to the Corporation or its transfer agent of the certificate theretofore properly endorsed or accompanied by a written assignment or power of attorney properly executed, with transfer stamps (if necessary) affixed, and with such proof of the authenticity of signature as the Corporation or its transfer agent may reasonably require.

SECTION 3. Record Holders. Except as may otherwise be required by law, by the Certificate or by these By-laws, the Corporation shall be entitled to treat the record holder of stock as shown on its books as the owner of such stock for all purposes, including the payment of dividends and the right to vote with respect thereto, regardless of any transfer, pledge or other disposition of such stock, until the shares have been transferred on the books of the Corporation in accordance with the requirements of these By-laws.

SECTION 4. Record Date. In order that the Corporation may determine the stockholders entitled to notice of or to vote at any meeting of stockholders or any adjournment thereof or entitled to receive payment of any dividend or other distribution or allotment of any rights, or entitled to exercise any rights in respect of any change, conversion or exchange of stock or for the purpose of any other lawful action, the Board of Directors may fix a record date, which record date shall not precede the date upon which the resolution fixing the record date is adopted by the Board of Directors, and which record date: (a) in the case of determination of stockholders entitled to vote at any meeting of stockholders, shall, unless otherwise required by law, not be more than sixty nor less than ten days before the date of such meeting and (b) in the case of any other action, shall not be more than sixty days prior to such other action. If no record date is fixed: (i) the record date for determining stockholders entitled to notice of or to vote at a meeting of stockholders shall be at the close of business on the day next preceding the day on which notice is given, or, if notice is waived, at the close of business on the day next preceding the day on which the meeting is held and (ii) the record date for determining stockholders for any other purpose shall be at the close of business on the day on which the Board of Directors adopts the resolution relating thereto.

SECTION 5. Replacement of Certificates. In case of the alleged loss, destruction or mutilation of a certificate of stock, a duplicate certificate may be issued in place thereof, upon such terms as the Board of Directors may prescribe.

ARTICLE V

Indemnification

SECTION 1. Definitions. For purposes of this Article:

(a) “Corporate Status” describes the status of a person who is serving or has served (i) as a Director of the Corporation, (ii) as an Officer of the Corporation, or (iii) as a director, partner, trustee, officer, employee or agent of any other corporation, partnership, joint venture, trust, employee benefit plan or other enterprise which such person is or was serving at the request of the Corporation. For purposes of this Section 1(a), an Officer or Director of the Corporation who is serving or has served as a director, partner, trustee, officer, employee or agent of a Subsidiary shall be deemed to be serving at the request of the Corporation. Notwithstanding the foregoing, “Corporate Status” shall not include the status of a person who is serving or has served as a director, officer, employee or agent of a constituent corporation absorbed in a merger or consolidation transaction with the Corporation with respect to such person’s activities prior to said transaction, unless specifically authorized by the Board of Directors or the stockholders of the Corporation;

(b) “Director” means any person who serves or has served the Corporation as a director on the Board of Directors of the Corporation;

(c) “Disinterested Director” means, with respect to each Proceeding in respect of which indemnification is sought hereunder, a Director of the Corporation who is not and was not a party to such Proceeding;

(d) “Expenses” means all reasonable attorneys’ fees, retainers, court costs, transcript costs, fees of expert witnesses, private investigators and professional advisors (including, without limitation, accountants and investment bankers), travel expenses, duplicating costs, printing and binding costs, costs of preparation of demonstrative evidence and other courtroom presentation aids and devices, costs incurred in connection with document review, organization, imaging and computerization, telephone charges, postage, delivery service fees, and all other disbursements, costs or expenses of the type customarily incurred in connection with prosecuting, defending, preparing to prosecute or defend, investigating, being or preparing to be a witness in, settling or otherwise participating in, a Proceeding;

(e) “Non-Officer Employee” means any person who serves or has served as an employee or agent of the Corporation, but who is not or was not a Director or Officer;

(f) “Officer” means any person who serves or has served the Corporation as an officer appointed by the Board of Directors of the Corporation;

(g) “Proceeding” means any threatened, pending or completed action, suit, arbitration, alternate dispute resolution mechanism, inquiry, investigation, administrative hearing or other proceeding, whether civil, criminal, administrative, arbitral or investigative; and

(h) “Subsidiary” shall mean any corporation, partnership, limited liability company, joint venture, trust or other entity of which the Corporation owns (either directly or through or together with another Subsidiary of the Corporation) either (i) a general partner, managing member or other similar interest or (ii) (A) 50% or more of the voting power of the voting capital equity interests of such corporation, partnership, limited liability company, joint venture or other entity, or (B) 50% or more of the outstanding voting capital stock or other voting equity interests of such corporation, partnership, limited liability company, joint venture or other entity.

SECTION 2. Indemnification of Directors and Officers. Subject to the operation of Section 4 of this Article V of these By-laws, each Director and Officer shall be indemnified and held harmless by the Corporation to the fullest extent authorized by the DGCL, as the same exists or may hereafter be amended (but, in the case of any such amendment, only to the extent that such amendment permits the Corporation to provide broader indemnification rights than such law permitted the Corporation to provide prior to such amendment) against any and all Expenses, judgments, penalties, fines and amounts reasonably paid in settlement that are incurred by such Director or Officer or on such Director’s or Officer’s behalf in connection with any threatened, pending or completed Proceeding or any claim, issue or matter therein, which such Director or Officer is, or is threatened to be made, a party to or participant in by reason of such Director’s or Officer’s Corporate Status, if such Director or Officer acted in good faith and in a manner such Director or Officer reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful. The rights of indemnification provided by this Section 2 shall continue as to a Director or Officer after he or she has ceased to be a Director or Officer and shall inure to the benefit of his or her heirs, executors, administrators and personal representatives. Notwithstanding the foregoing, the Corporation shall indemnify any Director or Officer seeking indemnification in connection with a Proceeding initiated by such Director or Officer only if such Proceeding was authorized by the Board of Directors of the Corporation,

unless such Proceeding was brought to enforce an Officer or Director's rights to indemnification or, in the case of Directors, advancement of Expenses under these By-laws in accordance with the provisions set forth herein.

SECTION 3. Indemnification of Non-Officer Employees. Subject to the operation of Section 4 of this Article V of these By-laws, each Non-Officer Employee may, in the discretion of the Board of Directors of the Corporation, be indemnified by the Corporation to the fullest extent authorized by the DGCL, as the same exists or may hereafter be amended, against any or all Expenses, judgments, penalties, fines and amounts reasonably paid in settlement that are incurred by such Non-Officer Employee or on such Non-Officer Employee's behalf in connection with any threatened, pending or completed Proceeding, or any claim, issue or matter therein, which such Non-Officer Employee is, or is threatened to be made, a party to or participant in by reason of such Non-Officer Employee's Corporate Status, if such Non-Officer Employee acted in good faith and in a manner such Non-Officer Employee reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal proceeding, had no reasonable cause to believe his or her conduct was unlawful. The rights of indemnification provided by this Section 3 shall exist as to a Non-Officer Employee after he or she has ceased to be a Non-Officer Employee and shall inure to the benefit of his or her heirs, personal representatives, executors and administrators. Notwithstanding the foregoing, the Corporation may indemnify any Non-Officer Employee seeking indemnification in connection with a Proceeding initiated by such Non-Officer Employee only if such Proceeding was authorized by the Board of Directors of the Corporation.

SECTION 4. Good Faith. Unless ordered by a court, no indemnification shall be provided pursuant to this Article V to a Director, to an Officer or to a Non-Officer Employee unless a determination shall have been made that such person acted in good faith and in a manner such person reasonably believed to be in or not opposed to the best interests of the Corporation and, with respect to any criminal Proceeding, such person had no reasonable cause to believe his or her conduct was unlawful. Such determination shall be made by (a) a majority vote of the Disinterested Directors, even though less than a quorum of the Board of Directors, (b) a committee comprised of Disinterested Directors, such committee having been designated by a majority vote of the Disinterested Directors (even though less than a quorum), (c) if there are no such Disinterested Directors, or if a majority of Disinterested Directors so directs, by independent legal counsel in a written opinion, or (d) by the stockholders of the Corporation.

SECTION 5. Advancement of Expenses to Directors Prior to Final Disposition.

(a) The Corporation shall advance all Expenses incurred by or on behalf of any Director in connection with any Proceeding in which such Director is involved by reason of such Director's Corporate Status within ten (10) days after the receipt by the Corporation of a written statement from such Director requesting such advance or advances from time to time, whether prior to or after final disposition of such Proceeding. Such statement or statements shall reasonably evidence the Expenses incurred by such Director and shall be preceded or accompanied by an undertaking by or on behalf of such Director to repay any Expenses so advanced if it shall ultimately be determined that such Director is not entitled to be indemnified against such Expenses. Notwithstanding the foregoing, the Corporation shall advance all Expenses incurred by or on behalf of any Director seeking advancement of expenses hereunder

in connection with a Proceeding initiated by such Director only if such Proceeding was (i) authorized by the Board of Directors of the Corporation, or (ii) brought to enforce Director's rights to indemnification or advancement of Expenses under these By-laws.

(b) If a claim for advancement of Expenses hereunder by a Director is not paid in full by the Corporation within 10 days after receipt by the Corporation of documentation of Expenses and the required undertaking, such Director may at any time thereafter bring suit against the Corporation to recover the unpaid amount of the claim and if successful in whole or in part, such Director shall also be entitled to be paid the expenses of prosecuting such claim. The failure of the Corporation (including its Board of Directors or any committee thereof, independent legal counsel, or stockholders) to make a determination concerning the permissibility of such advancement of Expenses under this Article V shall not be a defense to the action and shall not create a presumption that such advancement is not permissible. The burden of proving that a Director is not entitled to an advancement of expenses shall be on the Corporation.

(c) In any suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall be entitled to recover such expenses upon a final adjudication that the Director has not met any applicable standard for indemnification set forth in the DGCL.

SECTION 6. Advancement of Expenses to Officers and Non-Officer Employees Prior to Final Disposition.

(a) The Corporation may, at the discretion of the Board of Directors of the Corporation, advance any or all Expenses incurred by or on behalf of any Officer and Non-Officer Employee in connection with any Proceeding in which such is involved by reason of the Corporate Status of such Officer or Non-Officer Employee upon the receipt by the Corporation of a statement or statements from such Officer or Non-Officer Employee requesting such advance or advances from time to time, whether prior to or after final disposition of such Proceeding. Such statement or statements shall reasonably evidence the Expenses incurred by such Officer and Non-Officer Employee and shall be preceded or accompanied by an undertaking by or on behalf of such to repay any Expenses so advanced if it shall ultimately be determined that such Officer or Non-Officer Employee is not entitled to be indemnified against such Expenses.

(b) In any suit brought by the Corporation to recover an advancement of expenses pursuant to the terms of an undertaking, the Corporation shall be entitled to recover such expenses upon a final adjudication that the Officer or Non-Officer Employee has not met any applicable standard for indemnification set forth in the DGCL.

SECTION 7. Contractual Nature of Rights.

(a) The foregoing provisions of this Article V shall be deemed to be a contract between the Corporation and each Director and Officer entitled to the benefits hereof at any time while this Article V is in effect, and any repeal or modification thereof shall not affect any rights or obligations then existing with respect to any state of facts then or theretofore existing or any

Proceeding theretofore or thereafter brought based in whole or in part upon any such state of facts.

(b) If a claim for indemnification hereunder by a Director or Officer is not paid in full by the Corporation within 60 days after receipt by the Corporation of a written claim for indemnification, such Director or Officer may at any time thereafter bring suit against the Corporation to recover the unpaid amount of the claim, and if successful in whole or in part, such Director or Officer shall also be entitled to be paid the expenses of prosecuting such claim. The failure of the Corporation (including its Board of Directors or any committee thereof, independent legal counsel, or stockholders) to make a determination concerning the permissibility of such indemnification under this Article V shall not be a defense to the action and shall not create a presumption that such indemnification is not permissible. The burden of proving that a Director or Officer is not entitled to indemnification shall be on the Corporation.

(c) In any suit brought by a Director or Officer to enforce a right to indemnification hereunder, it shall be a defense that such Director or Officer has not met any applicable standard for indemnification set forth in the DGCL.

SECTION 8. Non-Exclusivity of Rights. The rights to indemnification and advancement of Expenses set forth in this Article V shall not be exclusive of any other right which any Director, Officer, or Non-Officer Employee may have or hereafter acquire under any statute, provision of the Certificate or these By-laws, agreement, vote of stockholders or Disinterested Directors or otherwise.

SECTION 9. Insurance. The Corporation may maintain insurance, at its expense, to protect itself and any Director, Officer or Non-Officer Employee against any liability of any character asserted against or incurred by the Corporation or any such Director, Officer or Non-Officer Employee, or arising out of any such person's Corporate Status, whether or not the Corporation would have the power to indemnify such person against such liability under the DGCL or the provisions of this Article V.

SECTION 10. Other Indemnification. The Corporation's obligation, if any, to indemnify any person under this Article V as a result of such person serving, at the request of the Corporation, as a director, partner, trustee, officer, employee or agent of another corporation, partnership, joint venture, trust, employee benefit plan or other enterprise shall be reduced by any amount such person may collect as indemnification from such other corporation, partnership, joint venture, trust, employee benefit plan or enterprise.

ARTICLE VI

Miscellaneous Provisions

SECTION 1. Fiscal Year. The fiscal year of the Corporation shall be determined by the Board of Directors.

SECTION 2. Seal. The Board of Directors shall have power to adopt and alter the seal of the Corporation.

SECTION 3. Execution of Instruments. All deeds, leases, transfers, contracts, bonds, notes and other obligations to be entered into by the Corporation in the ordinary course of its business without director action may be executed on behalf of the Corporation by the Chairman of the Board, if one is elected, the President or the Treasurer or any other officer, employee or agent of the Corporation as the Board of Directors or Executive Committee may authorize.

SECTION 4. Voting of Securities. Unless the Board of Directors otherwise provides, the Chairman of the Board, if one is elected, the President or the Treasurer may waive notice of and act on behalf of this Corporation, or appoint another person or persons to act as proxy or attorney in fact for this Corporation with or without discretionary power and/or power of substitution, at any meeting of stockholders or shareholders of any other corporation or organization, any of whose securities are held by this Corporation.

SECTION 5. Resident Agent. The Board of Directors may appoint a resident agent upon whom legal process may be served in any action or proceeding against the Corporation.

SECTION 6. Corporate Records. The original or attested copies of the Certificate, By-laws and records of all meetings of the incorporators, stockholders and the Board of Directors and the stock transfer books, which shall contain the names of all stockholders, their record addresses and the amount of stock held by each, may be kept outside the State of Delaware and shall be kept at the principal office of the Corporation, at the office of its counsel or at an office of its transfer agent or at such other place or places as may be designated from time to time by the Board of Directors.

SECTION 7. Certificate. All references in these By-laws to the Certificate shall be deemed to refer to the Amended and Restated Certificate of Incorporation of the Corporation, as amended and in effect from time to time.

SECTION 8. Amendment of By-laws.

(a) Amendment by Directors. Except as provided otherwise by law, these By-laws may be amended or repealed by the Board of Directors by the affirmative vote of a majority of the directors then in office.

(b) Amendment by Stockholders. These By-laws may be amended or repealed at any Annual Meeting, or special meeting of stockholders called for such purpose, by the affirmative vote of at least 75% of the outstanding shares entitled to vote on such amendment or repeal, voting together as a single class; provided, however, that if the Board of Directors recommends that stockholders approve such amendment or repeal at such meeting of stockholders, such amendment or repeal shall only require the affirmative vote of the majority of the outstanding shares entitled to vote on such amendment or repeal, voting together as a single class. Notwithstanding the foregoing, stockholder approval shall not be required unless mandated by the Certificate, these By-laws, or other applicable law.

SECTION 9. Notices. If mailed, notice to stockholders shall be deemed given when deposited in the mail, postage prepaid, directed to the stockholder at such stockholder's address as it appears on the records of the Corporation. Without limiting the manner by which notice

otherwise may be given to stockholders, any notice to stockholders may be given by electronic transmission in the manner provided in Section 232 of the DGCL.

SECTION 10. Waivers. A written waiver of any notice, signed by a stockholder or director, or waiver by electronic transmission by such person, whether given before or after the time of the event for which notice is to be given, shall be deemed equivalent to the notice required to be given to such person. Neither the business nor the purpose of any meeting need be specified in such a waiver.

SECTION 11. Exclusive Forum Provision. Unless the Corporation consents in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware (or, if and only if the Court of Chancery of the State of Delaware does not have subject matter jurisdiction, any state court located within the State of Delaware or, if and only if all such state courts lack subject matter jurisdiction, the federal district court for the District of Delaware) shall be the sole and exclusive forum for the following types of actions or proceedings under Delaware statutory or common law: (a) any derivative action or proceeding brought on behalf of the Corporation, (b) any action asserting a claim of breach of a fiduciary duty owed by any current or former Director, Officer or other employee of the Corporation, to the Corporation or the Corporation's stockholders, (c) any action or proceeding asserting a claim against the Corporation or any current or former Director, Officer or other employee of the Corporation arising out of or pursuant to any provision of the DGCL or the Corporation's Certificate or the By-laws of the Corporation (in each case, as they may be amended from time to time), (d) any action or proceeding to interpret, apply, enforce or determine the validity of the Corporation's Certificate or the By-laws of the Corporation (including any right, obligation, or remedy thereunder), (e) any action or proceeding as to which the DGCL confers jurisdiction to the Court of Chancery of the State of Delaware, or (f) any action asserting a claim governed by the internal affairs doctrine against the Corporation or any Director, Officer or other employee of the Corporation, in all cases to the fullest extent permitted by law and subject to the court's having personal jurisdiction over the indispensable parties named as defendants. This Article VI, Section 11 shall not apply to actions brought to enforce a duty or liability created by the Securities Act of 1933, as amended, the Exchange Act, or any claim for which the federal courts have exclusive jurisdiction. Unless the Corporation consents in writing to the selection of an alternative forum, the federal district courts of the United States shall, to the fullest extent permitted by applicable law, be the sole and exclusive forum for the resolution of any complaint asserting a cause of action arising under the Securities Act of 1933, as amended. Any person or entity purchasing or otherwise acquiring any interest in shares of capital stock of the Corporation shall be deemed to have notice of and consented to the provisions of this Article VI, Section 11.

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 10, 2021

/s/ OLIVER PEOPLES

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

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 10, 2021

/s/ CHARLES B. HAASER

Name: Charles B. Haaser
 Title: Chief Accounting Officer
 (Principal Financial and Accounting Officer)

**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, 2021 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 10, 2021

/s/ OLIVER PEOPLES

Oliver Peoples
President and Chief Executive Officer
(Principal Executive Officer)

Dated: November 10, 2021

/s/ CHARLES B. HAASER

Charles B. Haaser
Chief Accounting Officer
(Principal Financial and Accounting Officer)