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 June 30, 2018

OR

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

For the transition period from to

Commission file number 001-33133

YIELD10 BIOSCIENCE, INC.

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

(617) 583-1700

(Registrant's telephone number, including area code)

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

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

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No o

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

Large accelerated filer o	Accelerated filer o
Non-accelerated filer o (Do not check if a smaller reporting company)	Smaller reporting company x
Emerging growth company o	

If an emerging growth company, indicate by check mark if the registrant elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. o

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

The number of shares outstanding of the registrant's common stock as of August 7, 2018 was 10,011,395.

Yield10 Bioscience, Inc.
Form 10-Q
For the Quarter Ended June 30, 2018

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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)

	June 30, 2018	December 31, 2017
Assets		
Current Assets:		
Cash and cash equivalents	$ 3,168	$ 14,487
Short-term investments	6,486	—
Accounts receivable	29	54
Unbilled receivables	43	65
Prepaid expenses and other current assets	378	311
Total current assets	10,104	14,917
Restricted cash	332	317
Property and equipment, net	1,477	1,539
Other assets	98	109
Total assets	$ 12,011	$ 16,882
Liabilities and Stockholders' Equity		
Current Liabilities:		
Accounts payable	$ 34	$ 76
Accrued expenses	1,455	2,299
Total current liabilities	1,489	2,375
Lease incentive obligation, net of current portion	941	1,005
Total liabilities	2,430	3,380
Commitments and contingencies (Note 8)		
Stockholders' Equity:		
Series A Convertible Preferred Stock ($0.01 par value per share); 5,000,000 shares authorized at June 30, 2018 and December 31, 2017; 0 and 1,826 shares issued and outstanding at June 30, 2018 and December 31, 2017, respectively	—	818
Common stock ($0.01 par value per share); 60,000,000 shares and 40,000,000 shares authorized at June 30, 2018 and December 31, 2017, respectively; 9,991,977 and 9,089,159 shares issued and outstanding at June 30, 2018 and December 31, 2017, respectively	100	91
Additional paid-in capital	357,013	355,431
Accumulated other comprehensive loss	(99)	(85)
Accumulated deficit	(347,433)	(342,753)
Total stockholders' equity	9,581	13,502
Total liabilities and stockholders' equity	$ 12,011	$ 16,882

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 June 30,		Six Months Ended June 30,	
	2018	**2017**	**2018**	**2017**
Revenue:				
Grant revenue	$ 285	$ 293	$ 345	$ 617
Total revenue	285	293	345	617
Expenses:				
Research and development	1,253	1,138	2,347	2,247
General and administrative	1,452	1,866	2,725	3,142
Total expenses	2,705	3,004	5,072	5,389
Loss from operations	(2,420)	(2,711)	(4,727)	(4,772)
Other income (net):				
Interest income, net	45	2	80	3
Other expense, net	(15)	(18)	(33)	(50)
Total other income (expense), net	30	(16)	47	$ (47)
Net loss	$ (2,390)	$ (2,727)	$ (4,680)	$ (4,819)
Basic and diluted net loss per share	$ (0.24)	$ (0.96)	$ (0.48)	$ (1.69)
Number of shares used in per share calculations:				
Basic & Diluted	9,991,460	2,849,069	9,845,902	2,844,492

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 June 30,		Six Months Ended June 30,	
	2018	**2017**	**2018**	**2017**
Net loss:	$ (2,390)	$ (2,727)	$ (4,680)	$ (4,819)
Other comprehensive loss				
Change in unrealized gain (loss) on investments	(1)	—	—	—
Change in foreign currency translation adjustment	(9)	2	(14)	—
Total other comprehensive loss	(10)	2	(14)	—
Comprehensive loss	$ (2,400)	$ (2,725)	$ (4,694)	$ (4,819)

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)

	Six Months Ended June 30,	
	2018	**2017**
Cash flows from operating activities		
Net loss	$ (4,680)	$ (4,819)
Adjustments to reconcile net loss to cash used in operating activities:		
Depreciation	96	106
Charge for 401(k) company common stock match	70	46
Stock-based compensation	596	663
Changes in operating assets and liabilities:		
Accounts receivables	54	(147)
Due from related party	—	1
Unbilled receivables	22	26
Prepaid expenses and other assets	(56)	542
Accounts payable	(42)	14
Accrued expenses	(884)	(165)
Contract termination obligation and other long-term liabilities	(64)	(553)
Net cash used for operating activities	(4,888)	(4,286)
Cash flows from investing activities		
Purchase of property and equipment	(34)	—
Purchase of short-term investments	(7,986)	—
Proceeds from the sale and maturity of short-term investments	1,500	—
Net cash used for investing activities	(6,520)	—
Cash flows from financing activities		
Proceeds from warrants exercised	124	—
Taxes paid related to net share settlement upon vesting of stock awards	(6)	(12)
Net cash provided by (used for) financing activities	118	(12)
Effect of exchange rate changes on cash, cash equivalents and restricted cash	(14)	—
Net decrease in cash, cash equivalents and restricted cash	(11,304)	(4,298)
Cash, cash equivalents and restricted cash at beginning of period	14,804	7,741
Cash, cash equivalents and restricted cash at end of period	$ 3,500	$ 3,443
Supplemental disclosure of non-cash information:		
Offering costs remaining in accrued expenses	$ —	$ 146
Reversal of deferred financing costs related to Aspire stock purchase agreement	$ —	$ 450

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

(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 Bioscience," "Yield10," or the "Company") is an agricultural bioscience company focusing on the development of new technologies to enable step-change increases in crop yield to enhance global food security. The Company considers 10-20 percent increases in crop yield to be step-change increases. According to a United Nations report, food production must be increased by over 70 percent in the next 35 years to feed the growing global population, which is expected to increase from 7 billion to more than 9.6 billion by 2050. During that time period, there will be a reduction in available arable land as a result of infrastructure growth and increased pressure on scarce water resources. Harvestable food production per acre and per growing season must be increased to meet this demand. At the same time, in light of the increasing focus on health and wellness, food safety and sustainability in developed countries, the Company anticipates a rise in demand for new varieties of food and food ingredients with improved nutritional properties. Further, concerns about food safety have led to the concept of “seed to plate,” or "farm to fork," with a focus on stringent quality control along the entire value chain. If this concept takes hold with consumers, it is likely to require identity preservation from seed to harvest and involve contract farming. This concept has been initially implemented in agricultural biotechnology, in products such as high oleic canola and soybean. Consumer demand for identity preserved specialty ingredients is also expected to rise, and the Company believes that Yield10's crop yield technologies and crop genome-editing platform could be useful in this emerging field.

The foundation technology of Yield10 is based on using two proprietary advanced biotechnology trait gene discovery platforms to improve fundamental crop yield through enhanced photosynthetic carbon capture and increased carbon utilization efficiency to increase seed yield. These platforms are based on the principle that plants which capture and utilize carbon more efficiently will enable more robust crops capable of increased seed yield. Yield10 is working to develop, translate and demonstrate the commercial value of a number of novel yield trait genes from these discovery platforms in major crops. The Company's “Smart Carbon Grid for Crops” metabolic engineering platform has already proven useful in identifying a number of its C3000 series of traits, including the novel yield trait gene C3003 which is being field tested in Camelina and canola in the 2018 growing season. The Company's “T3 Platform,” is based on mining transcription factor network data sets and led to the identification of its C4001, C4002 and C4003 global transcription factor gene traits. These gene traits enabled the Company to engineer switchgrass plants with high rates of photosynthesis and increased biomass yield. The Company is currently repeating its work with C4001 and C4003 in rice and wheat and plans to do so in corn.

Yield10 is currently combining the two trait gene discovery platforms to create an integrated system for identifying key plant gene combinations for modification using genome editing to improve crop performance. Advanced metabolic flux analysis forms the foundation of the GRAIN platform the Company is developing based on Yield10 scientists unique 20-plus years of experience successfully deploying advanced metabolic flux analysis to address critical bottlenecks in carbon metabolism. Based on elements of the GRAIN platform that the Company is already working on, it has identified the C4004 through C4027 series of transcription factor genes that are down-regulated in the Company's high-photosynthesis engineered switchgrass plants as well as a number of new gene targets related to the Company's lead C3003 yield trait. New tools for genome-editing continue to develop at a fast pace and be deployed against known targets which for the most part are focused on changing seed or seed oil composition. However, identifying gene combinations remains an unmet need.

The Company is currently progressing the development of its lead yield trait genes in canola, soybean, rice and wheat to provide step-change yield solutions for enhancing global food security. Yield10 Bioscience is headquartered in Woburn, Massachusetts and has an additional agricultural science facility with greenhouses in Saskatoon, Saskatchewan, Canada.

On May 17, 2018, the Company entered into an exclusive worldwide license from the University of Missouri 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 first technology, named C3007, is a gene for a negative controller that inhibits the enzyme activity of Acetyl-CoA carboxylase, or ACCase. The second technology, named C3010, is a gene which, if over-expressed, results in increased activity of ACCase. The Company is required to use reasonable efforts to develop licensed products throughout the licensed field and to introduce licensed products into the commercial market. In that regard, the Company is obligated to fulfill certain research, development and regulatory milestones relating to C3007 and C3010, including completion of multi-site field demonstrations of a crop species in which C3007 and C3010 have been introduced, and filing for regulatory approval of a crop species in which C3007 and C3010 have been introduced within a specified period.

During July 2018, the Company also entered into a non-exclusive research license agreement jointly with the Broad Institute of MIT and Harvard and Pioneer, part of Corteva Agriscience™ Agriculture Division of DowDupont, for the use of CRISPR-Cas9 genome-editing technology for crops. The joint license covers intellectual property consisting of approximately 48 patents and patent applications on CRISPR-Cas9 technology controlled by the Broad Institute and Corteva Agriscience. Under the agreement, the Company has the option to renew the license on an annual basis and the right to convert the research license to a commercial license in the future, subject to conditions specified in the agreement. CRISPR technology is uniquely suited to agricultural applications as it enables precise changes to plant DNA without the use of foreign DNA to incorporate new traits. Plants developed using CRISPR genome-editing technology have the potential to be designated as "non-regulated" by the U.S. Department of Agriculture - Animal and Plant Health Inspection Service ("USDA-APHIS") for development and commercialization in the U.S., which could result in shorter developmental timelines and lower costs associated with commercialization of new traits in the U.S. as compared to regulated crops.

The accompanying condensed consolidated financial statements 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 a fair statement of the financial position and results of operations for the interim periods ended June 30, 2018 and June 30, 2017.

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 consolidated financial statements should be read in conjunction with the audited consolidated financial statements for the year ended December 31, 2017, which are contained in the Company's Annual Report on Form 10-K filed with the SEC on March 12, 2018.

As of June 30, 2018, the Company held unrestricted cash, cash equivalents and short-term investments of $9,654. The Company follows the guidance of 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 and meet its obligations into the third quarter of 2019. 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 has evaluated the guidance of ASC Topic 205-40 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. 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 grant 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 or if the Company is unsuccessful in entering into collaborative arrangements for further research, 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 and equipment. Based on its cash forecast, management has determined that the Company's present capital resources are unlikely to be sufficient to fund its planned operations for the twelve months from the date that the financial statements are issued, which raises substantial doubt about the Company's ability to continue as a going concern.

If the Company issues equity or debt securities to raise additional funds, (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 of 1986 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.

2. ACCOUNTING POLICIES

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 six months ended June 30, 2018, the Company adopted the following new accounting guidance.

In May 2014, the FASB issued ASU No. 2014-09, *Revenue from Contracts with Customers (Topic 606).* The ASU is the result of a joint project by the FASB and the International Accounting Standards Board ("IASB") to clarify the principles for recognizing revenue and to develop a common revenue standard for GAAP and International Financial Reporting Standards ("IFRS") that would: remove inconsistencies and weaknesses in the treatment of this area between GAAP and IFRS, provide a more robust framework for addressing revenue issues, improve comparability of revenue recognition practices across entities, jurisdictions, industries, and capital markets, improve disclosure requirements and resulting financial statements, and simplify the presentation of financial statements. The core principle of the new guidance is that an entity should recognize revenue to depict the transfer of promised goods or services in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The Company adopted the new standard effective January 1, 2018 using the modified retrospective method and determined that its grant revenue, which is its sole source of revenue, does not fall within the guidance of the new standard. The Company will review future customer revenue agreements against the guidance provided by ASU No. 2014-09 to ensure that revenue is recorded appropriately.

In January 2016 the FASB issued ASU No. 2016-01, *Financial Instruments - Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities*. This new standard amended certain aspects of accounting and disclosure requirements for financial instruments, including the requirement that equity investments with readily determinable fair values are to be measured at fair value with any changes in fair value recognized in a company's statements of operations. Prior to adoption of ASU 2016-01, companies recognized changes in fair value in accumulated other comprehensive income (loss), net. Equity investments that do not have readily determinable fair values may be measured at fair value or at cost minus impairment adjusted for changes in observable prices. In addition, a valuation allowance should be evaluated on deferred tax assets related to available-for-sale debt securities in combination with other deferred tax assets. The Company adopted this new standard on January 1, 2018, using the modified retrospective method, and determined that it did not have a material impact on the Company's financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows (Topic 230): Classification of Certain Cash Receipts and Cash Payments*. The new standard clarifies certain aspects of the statement of cash flows, including the classification of debt prepayment or debt extinguishment costs, settlement of zero-coupon debt instruments or other debt instruments with coupon interest rates that are insignificant in relation to the effective interest rate of the borrowing, contingent consideration payments made after a business combination, proceeds from the settlement of insurance claims, proceeds from the settlement of corporate-owned life insurance policies, distributions received from equity method investees and beneficial interests in securitization transactions. The new standard also clarifies that an entity should determine each separately identifiable source or use within the cash receipts and cash payments on the basis of the nature of the underlying cash flows. In situations in which cash receipts and payments have aspects of more than one class of cash flows and cannot be separated by source or use, the appropriate classification should depend on the activity that is likely to be the predominant source or use of cash flows for the item. The Company adopted this new standard on January 1, 2018 and determined that it did not have a material impact on the Company's financial statements.

In October 2016, the FASB issued ASU No. 2016-16, *Income Taxes (Topic 740): Intra-Entity Transfer of Assets Other Than Inventory*. This new standard eliminates the deferral of the tax effects of intra-entity asset transfers other than inventory. As a result, the income tax consequences from the intra-entity transfer of an asset other than inventory and associated changes to deferred taxes will be recognized when the transfer occurs. The Company adopted this new standard on January 1, 2018 and determined that it did not have a material impact on the Company's financial statements.

In November 2016, the FASB issued ASU 2016-18, *Statement of Cash Flows (Topic 230): Restricted Cash* ("ASU 2016-18"). The new standard provides uniform guidance for the classification and presentation of changes in restricted cash on the statement of cash flows under Topic 230, *Statement of Cash Flows*. ASU 2016-18 requires that a statement of cash flows explain the change during the period in the total of cash, cash equivalents, and amounts generally described as restricted cash. Therefore, amounts included in restricted cash should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. ASU 2016-18 was effective for the Company for its fiscal year beginning January 1, 2018, including interim periods, and requires a retrospective presentation of each period presented. As a result, the Company's Condensed Consolidated Statement of Cash Flows for the six months ended June 30, 2018 and June 30, 2017 have been prepared in accordance with the new requirements of ASU 2016-18.

Other than the new standards described above, there have been no material changes in accounting policies since the Company's fiscal year ended December 31, 2017, as described in Note 2 to the consolidated financial statements included in its Annual Report on Form 10-K for the year then ended.

New pronouncements that are not yet effective but may impact the Company's financial statements in the future are described below.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842).* The new standard requires that all lessees recognize the assets and liabilities that arise from leases on the balance sheet and disclose qualitative and quantitative information about its leasing arrangements. The new standard will be effective for Yield10 Bioscience on January 1, 2019. The Company is in the process of evaluating the impact of this new guidance.

In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments*. The new standard changes the impairment model for most financial assets and certain other instruments. Under the new standard, entities holding financial assets and net investment in leases that are not accounted for at fair value through net income are to be presented at the net amount expected to be collected. An allowance for credit losses will be a valuation account that will be deducted from the amortized cost basis of the financial asset to present the net carrying value at the amount expected to be collected on the financial asset. The new standard will be effective for the Company on January 1, 2020. The Company is in the process of evaluating the impact of this new guidance.

Principles of Consolidation

The Company's consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States of America. The consolidated financial statements include the accounts of the Company and its wholly-owned subsidiaries. All intercompany transactions were eliminated, including transactions with its Canadian subsidiary, Metabolix Oilseeds, Inc.

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 Condensed Consolidated Balance Sheets included herein:

	June 30, 2018	December 31, 2017
Cash and cash equivalents	$ 3,168	$ 14,487
Restricted cash	332	317
Total cash, cash equivalents and restricted cash shown in the condensed consolidated statements of cash flows	$ 3,500	$ 14,804

Amounts included in restricted cash represent those required to be set aside by contractual agreement. Restricted cash of $332 at June 30, 2018 and $317 at December 31, 2017 primarily consists of funds held in connection with the Company's lease agreement for its Woburn, Massachusetts facility.

Investments

The Company considers all 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. All other investments are classified as long-term. The Company held no long-term investments at June 30, 2018 and no short or long-term investments at December 31, 2017.

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.

Restructuring

In 2016, the Company announced a strategic restructuring under which Yield10 Bioscience became its core business and its biopolymer operations were discontinued. The Company records estimated restructuring charges for employee severance and contract termination costs as a current period expense as those costs become contractually fixed, probable and estimable. Obligations associated with these charges are reduced or adjusted as payments are made or the Company's estimates are revised.

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

Foreign denominated assets and liabilities of the Company's wholly owned foreign subsidiaries 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 or substantially sells 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.

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 the deferred tax asset to a level which, more likely than not, will be realized.

In December 2017, the Tax Cuts and Jobs Act, or the Tax Act ("TCJA"), was signed into law. Among other things, the Tax Act permanently lowers the corporate federal income tax rate to 21% effective for tax years including or commencing January 1, 2018. As a result of the reduction of the corporate federal income tax rate, GAAP requires companies to revalue their deferred tax assets and deferred tax liabilities as of the date of enactment, with the resulting tax effects accounted for in the reporting period of enactment. The Company's preliminary estimate of the TCJA and the remeasurement of its deferred tax assets and liabilities is subject to change as additional information becomes available, but no later than one year from the enactment of the TCJA.

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 equivalents 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 June 30, 2018, 89% of the Company's total accounts and unbilled receivables of $72 are due from the Company's government grant with the Department of Energy ("DOE") or from its DOE sub-award contract with Michigan State University ("MSU").

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. 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, there is no difference in basic and dilutive loss per share. Common stock equivalents include stock options, restricted stock awards and warrants.

On May 26, 2017, the Company effected a 1-for-10 reverse stock split of its common stock. The calculation of basic and diluted net loss per share, as presented in the accompanying condensed consolidated statement of operations, have been determined based on a retroactive adjustment of weighted average shares outstanding for all periods presented.

The number of shares of potentially dilutive common stock presented on a weighted average basis, related to options, restricted stock units and warrants (prior to consideration of the treasury stock method) that were excluded from the calculation of dilutive shares since the inclusion of such shares would be anti-dilutive for the three and six months ended June 30, 2018 and June 30, 2017, respectively, are shown below. Issued and outstanding warrants shown in the table below are described in greater detail in Note 10, contained herein.

	Three Months Ended June 30,		Six Months Ended June 30,	
	2018	**2017**	**2018**	**2017**
Options	1,117,827	544,276	910,427	617,741
Restricted stock units	7,101	14,382	10,660	17,992
Warrants	10,597,486	393,300	10,597,486	393,300
Total	11,722,414	951,958	11,518,573	1,029,033

4. INVESTMENTS

The Company's investments consist of the following:

		Unrealized		
June 30, 2018	**Accumulated Cost**	**Gain**	**(Loss)**	**Market Value**
Short-term investments				
Government securities	$ 6,486	$ —	$ —	$ 6,486
Total	$ 6,486	$ —	$ —	$ 6,486

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, and 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. All other investments are classified as long-term. There were no long-term investments as of June 30, 2018 or December 31, 2017, and no short-term investments at December 31, 2017.

The Company reviews investments for other-than-temporary impairment whenever the fair value of an investment is less than the amortized cost and evidence indicates that an investment’s carrying amount is not recoverable within a reasonable period of time. Other-than-temporary impairments of investments are recognized in the Company's condensed consolidated statements of operations if the Company has experienced a credit loss and has the intent to sell the investment or if it is more likely than not that the Company will be required to sell the investment before recovery of the amortized cost basis. Evidence considered in this assessment includes reasons for the impairment, compliance with the Company’s investment policy, the severity and the duration of the impairment and changes in value subsequent to the end of the period. 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.

5. FAIR VALUE MEASUREMENTS

The Company has certain financial assets recorded at fair value which have been classified as either Level 1 or 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. 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. At June 30, 2018 and December 31, 2017, the Company did not own any Level 3 financial assets.

The Company's financial assets classified as Level 2 at June 30, 2018, 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 June 30, 2018.

The tables below present information about the Company's assets that are measured at fair value on a recurring basis as of June 30, 2018 and December 31, 2017 and indicate the fair value hierarchy of the valuation techniques utilized to determine such fair value.

	Fair value measurements at reporting date using			
Description	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Balance as of June 30, 2018
Cash equivalents:				
Money market funds	$ 2,594	$ —	$ —	$ 2,594
Short-term investments:				
U.S. government and agency securities	—	6,486	—	6,486
Total	$ 2,594	$ 6,486	$ —	$ 9,080

	Fair value measurements at reporting date using			
Description	Quoted prices in active markets for identical assets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)	Balance as of December 31, 2017
Cash equivalents:				
Money market funds	$ 11,025	$ —	$ —	$ 11,025
Total	$ 11,025	$ —	$ —	$ 11,025

6. ACCRUED EXPENSES

Accrued expenses consisted of the following at:

	June 30, 2018	December 31, 2017
Employee compensation and benefits	$ 407	$ 646
Leased facilities	627	585
Commercial manufacturing	—	489
Professional services	213	335
Other	208	244
Total accrued expenses	$ 1,455	$ 2,299

Accrued commercial manufacturing expense at December 31, 2017, is related to the Company's terminated biopolymer manufacturing contract obligation. See Note 11.

7. STOCK-BASED COMPENSATION

2018 Stock Option and Incentive Plan

On May 23, 2018, the Company held its 2018 annual meeting of stockholders (the "Annual Meeting"), at which the stockholders approved the adoption of the Company's 2018 Stock Option and Incentive Plan ("2018 Stock Plan"). The 2018 Stock Plan reserves for issuance 1,300,000 shares of the Company's common stock for grants of incentive stock options, nonqualified stock options, stock grants and stock-based awards. Shares available under the 2018 Stock Plan will be increased on the first day of January 2019 and 2020 in an amount equal to 5% of the outstanding shares of common stock on the day prior to the increase in each respective year or such smaller number of shares of common stock as determined by the Board of Directors.

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 $315 and $596 for the three and six months ended June 30, 2018, respectively. The Company recognized stock-based compensation expense related to stock awards of $399 and $663 for the three and six months ended June 30, 2017, respectively. At June 30, 2018, there was approximately $1,695 of pre-tax stock-based compensation expense related to unvested awards not yet recognized.

The compensation expense related to unvested stock options is expected to be recognized over a remaining weighted average period of 3.27 years.

Stock Options

A summary of option activity for the six months ended June 30, 2018 is as follows:

	Number of Shares	Weighted Average Exercise Price
Outstanding at December 31, 2017	702,033	$ 16.21
Granted	976,175	$ 1.65
Exercised	—	—
Forfeited	(791)	$ 12.64
Expired	(3,310)	$ 465.70
Outstanding at June 30, 2018	1,674,107	$ 6.84
Options vested and expected to vest at June 30, 2018	1,674,107	$ —
Options exercisable at June 30, 2018	596,656	$ —

Restricted Stock Units

Restricted Stock Units ("RSUs") awarded to employees generally vest in four equal annual installments beginning one year after the date of grant, subject to service conditions. RSUs awarded to non-employee directors generally vest one year after the date of grant, with the exception of RSUs granted in lieu of cash compensation, which vest immediately. The Company records stock compensation expense for RSUs on a straight line basis over their vesting period based on each RSU's award date market value.

The Company pays minimum required income tax withholding associated with RSUs for its employees. As the RSUs vest, the Company withholds a number of shares with an aggregate fair market value equal to the minimum tax withholding amount (unless the employee makes other arrangements for payment of the tax withholding) from the common stock issuable at the vest date. During the six months ended June 30, 2018 and June 30, 2017, the Company paid $6 and $12, respectively, for income tax withholdings associated with RSUs that vested during these periods.

A summary of RSU activity for the six months ended June 30, 2018 is as follows:

	Number of RSUs	Weighted Average Remaining Contractual Life (years)
Outstanding at December 31, 2017	14,367	
Awarded	—	
Common stock issued upon vesting	(7,104)	
Forfeited	(162)	
Outstanding at June 30, 2018	7,101	0.75
Weighted average remaining recognition period	0.75	

8. COMMITMENTS AND CONTINGENCIES

Leases

The Company rents its facilities under operating leases, which expire at various dates through December 2026. Rent expense for the three months and six months ended June 30, 2018 was $272 and $512, respectively. Rent expense for the three and six months ended June 30, 2017, was $268 and $448, respectively.

At June 30, 2018, the Company's future minimum payments required under operating leases are as follows:

Year ended December 31,	Minimum lease payments
2018 (July to December)	$ 496
2019	968
2020	778
2021	654
2022	676
Thereafter	2,832
Total	$ 6,404

Lease Commitments

During 2016, the Company entered into a lease agreement, pursuant to which the Company leases approximately 29,622 square feet of office and research and development space located at 19 Presidential Way, Woburn, Massachusetts. The lease began on June 1, 2016 and will end on November 30, 2026. The Company provided the landlord with a security deposit in the form of a letter of credit in the amount of $307 which is included within restricted cash in the Company's condensed consolidated balance sheet included herein. Pursuant to the lease, the Company will also pay certain taxes and operating costs associated with the premises during the term of the lease. During the buildout of the rented space, the landlord paid $889 for tenant improvements to the facility and an additional $444 for tenant improvements that result in increased rental payments by the Company. The current and non-current portions of the lease incentive obligations related to the landlord's contributions toward the cost of tenant improvements are recorded within accrued expenses and long-term lease incentive obligation, respectively, in the Company's condensed consolidated balance sheet contained herein.

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 as a result of its strategic shift to Yield10 Bioscience and the related restructuring of its operations. The sublease term is coterminous with the Company's master lease. CJ pays rent and operating expenses equal to approximately one-third of the amounts payable to the landlord by the Company, as adjusted from time-to-time in accordance with the terms of the master lease. Total future minimum operating lease payments of $6,404 shown above are net of the CJ sublease payments. CJ has provided the Company with a security deposit of $103 in the form of an irrevocable letter of credit.

The Company also leases approximately 13,702 square feet of office and laboratory space at 650 Suffolk Street, Lowell, Massachusetts. The lease for this facility expires in May 2020. During July 2018, the Company discontinued further use of the Lowell space as a result of decommissioning its computer data and systems backup and disaster recovery operations located within the facility. As a consequence, the Company will record a lease exit charge of approximately $249 during its third quarter for its remaining lease payments in accordance with ASC Topic 420-10, *Exit or Disposal Obligations*. The Company will continue to make monthly rental payments for the Lowell facility through its expiration in May 2020.

The Company's wholly owned subsidiary, Metabolix Oilseeds, Inc. ("MOI"), located in Saskatoon, Saskatchewan, Canada, leases approximately 4,100 square feet of office, laboratory and greenhouse space. MOI's leases for its various leased facilities expire between September 30, 2018 and May 31, 2020.

Contractual Commitments

In connection with the discontinuation of biopolymer operations, the Company ceased pilot production of biopolymer material and reached agreements with the owner-operators of its biopolymer pilot production facilities regarding the termination of their services. The Company recorded contract termination costs related to these manufacturing agreements of $2,641 during 2016 and as of June 30, 2018, no further amounts remain outstanding related to these terminated contracts.

Litigation

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

Guarantees

As of June 30, 2018 and December 31, 2017, the Company did not have significant liabilities recorded for guarantees.

The Company enters into indemnification provisions under various agreements with other companies in the ordinary course of business, typically with business partners, contractors, and customers. Under these provisions, the Company generally indemnifies and holds harmless the indemnified party for losses suffered or incurred by the indemnified party as a result of its activities. These indemnification provisions generally survive termination of the underlying agreement. The maximum potential amount of future payments the Company could be required to make under these indemnification provisions is unlimited. However, to date Yield10 Bioscience 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 June 30, 2018 and December 31, 2017.

9. GEOGRAPHIC INFORMATION

The geographic distribution of the Company's grant revenues and long-lived assets are summarized in the tables below:

	U.S.	Canada	Eliminations	Total
Three Months Ended June 30, 2018:				
Grant revenue from external customers	$ 285	$ —	$ —	$ 285
Inter-geographic revenues	—	372	(372)	—
Revenues	$ 285	$ 372	$ (372)	$ 285
Three Months Ended June 30, 2017:				
Grant revenue from external customers	$ 293	$ —	$ —	$ 293
Inter-geographic revenues	—	312	(312)	—
Revenues	$ 293	$ 312	$ (312)	$ 293
Six Months Ended June 30, 2018:				
Grant revenue from external customers	$ 345	$ —	$ —	$ 345
Inter-geographic revenues	—	640	(640)	—
Revenues	$ 345	$ 640	$ (640)	$ 345
Six Months Ended June 30, 2017:				
Grant revenue from external customers	$ 617	$ —	$ —	$ 617
Inter-geographic revenues	—	533	(533)	—
Revenues	$ 617	$ 533	$ (533)	$ 617

Foreign revenue is based on the country in which the Company's subsidiary that earned the revenue is domiciled. During the three and six months ended June 30, 2018, revenue earned from the Company's Camelina grant with the U.S. Department of Energy totaled $49 and $109, respectively, and represented 17% and 32% of total revenue. During the three and six months ended June 30, 2017, revenue earned from the Company's Camelina grants totaled $293 and $586, respectively, and represented 100% and 95%, respectively, of total grant revenue. During the three and six months ended June 30, 2018, revenue earned from the Company's new sub-award with MSU totaled $236 and $236, respectively, and represented 83% and 68%, respectively, of total grant revenue.

The geographic distribution of the Company's long-lived assets is summarized as follows:

	U.S.	Canada	Eliminations	Total
June 30, 2018	$ 1,469	$ 8	$ —	$ 1,477
December 31, 2017	$ 1,533	$ 6	$ —	$ 1,539

10. CAPITAL STOCK

Common Stock

On May 23, 2018, the Company held its Annual Meeting, at which stockholders approved an amendment to the Certificate of Incorporation to increase from 40,000,000 shares to 60,000,000 shares the aggregate number of shares of common stock that are authorized to be issued. As a result of this vote, on May 23, 2018, the Company filed a Certificate of Amendment to its Certificate of Incorporation with the Secretary of State of the State of Delaware to increase the number of authorized shares. Also at the Annual Meeting, stockholders approved the adoption of the Company's 2018 Stock Plan. The 2018 Stock Plan reserves for issuance 1,300,000 shares of the Company's common stock for grants of incentive stock options, nonqualified stock options, stock grants and stock-based awards. Shares available under the 2018 Stock Plan will be increased on the first day of January 2019 and 2020 in an amount equal to 5% of the outstanding shares of common stock on the day prior to the increase in each respective year or such smaller number of shares of common stock as determined by the Board of Directors.

On December 27, 2017, the Company held a special meeting of its stockholders, at which the stockholders approved an amendment to the Certificate of Incorporation to decrease from 250,000,000 shares to 40,000,000 shares the aggregate number of shares of common stock that are authorized to be issued. As a result of this vote, the Company filed a Certificate of Amendment to its Certificate of Incorporation with the Secretary of State of the State of Delaware on December 27, 2017 to decrease the number of authorized shares.

During December 2017, the Company closed on a public offering of its securities, receiving cash proceeds of $13,097, net of issuance costs of $1,392 that were paid through January 31, 2018. The offering included 4,667,000 Class A Units, priced at a public offering price of $2.25 per unit, with each unit consisting of one share of common stock, a Series A five-year warrant to purchase one share of common stock at an exercise price of $2.25 per share, and a Series B nine-month warrant to purchase 0.5 share of common stock at an exercise price of $2.25 per share, and 3,987 Class B Units, priced at a public offering price of $1,000 per unit, with each unit consisting of one share of preferred stock, having a conversion price of $2.25, Series A 5-year warrants to purchase 445 shares of common stock at an exercise price of $2.25 per share, and Series B nine-month warrants to purchase 223 shares of common stock with an exercise price of $2.25 per share. The Company determined that both the preferred stock and the warrants should be recorded within stockholders' equity.

Proceeds received from the offering were allocated to the various elements of the offering based on their relative fair values. The fair value of the common stock is its closing market price on December 21, 2017, the closing date of the offering. The Series A Convertible Preferred Stock was valued on an as-if-converted basis based on the underlying common stock and the Series A and Series B warrants were valued using the Black-Scholes model with the following weighted-average input at the time of issuance:

- an expected term of 5.0 years and 0.75 years for the Series A and Series B warrants, respectively,
- risk free rates of 2.2% and 1.7% for the Series A and Series B warrants, respectively, based on the published rates of U.S. treasury bills with similar terms, and
- volatility of 125% based on the Company’s historical volatility.

After allocation of the proceeds, the effective conversion price of the Series A Convertible Preferred Stock was determined to be beneficial and, as a result, the Company recorded a one-time non-cash deemed dividend of $1,427 equal to the intrinsic value of the beneficial conversion feature during its three months ended December 31, 2017. The Series A Convertible Preferred Stock did not have a stated redemption date, and as a consequence, accounting guidance required immediate recognition of the beneficial conversion feature rather than amortization of the benefit over time. As of March 19, 2018, preferred shareholders have converted all 3,987 of the preferred shares into an aggregate of 1,772,000 shares of common stock.

On September 12, 2017, the Company issued warrants to purchase up to 30,000 shares of common stock to the Company's investor relations consultant, in consideration for services rendered and to be rendered by the consultant. These warrants have an exercise price of $2.90 per share and are exercisable in whole or part at any time during the period commencing on September 12, 2017 and ending on September 11, 2024. The Company reviewed the accounting guidance for warrants and determined that these warrants should be recorded as equity within additional paid-in capital.

On July 7, 2017, the Company completed an offering of its securities. Proceeds from the transaction were approximately $1,966, net of issuance costs of $317. Investors participating in the transaction purchased a total of 570,784 shares of common stock at a price of $4.00 per share and an equal number of warrants with an exercise price of $5.04 per share, exercisable beginning on January 7, 2018 and until their expiration on January 7, 2024. In accordance with accounting guidance, these warrants were also recorded as equity within additional paid-in capital.

On May 26, 2017, the Company effected a 1-for-10 reverse stock split of its common stock. The ratio for the reverse stock split was determined by the Company's board of directors following approval by stockholders at the Company's annual meeting held on May 24, 2017. The reverse stock split reduced the number of shares of the Company's common stock outstanding at the time of the reverse stock split from approximately 28.7 million shares to approximately 2.9 million shares. Proportional adjustments were made to the Company's outstanding stock options and restricted stock units and to the number of shares issued and issuable under the Company's equity compensation plans.

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.

As discussed above, during December 2017 the Company closed on a public offering of its securities that included issuance of 3,987 shares of Series A Convertible Preferred Stock. Each preferred share was convertible, at the holder's option, into 445 shares of common stock at a conversion price of $2.25 per share, subject to adjustments as a result of stock dividends and stock splits. The Company determined the Series A Convertible Preferred Stock should be classified as equity since it was not mandatorily redeemable, there were no unconditional obligations requiring the Company to settle in a variable number of common shares or settle through the transfer of assets and the monetary value of the preferred shares was fixed. As of March 19, 2018, all of the 3,987 preferred shares had been converted to an aggregate of 1,772,000 shares of common stock. When converted, the shares of converted Series A Convertible Preferred Stock were restored to the status of authorized but unissued shares of preferred stock, subject to reissuance by the Board of Directors.

Warrants

The following table summarizes information with regard to outstanding warrants to purchase common stock as of June 30, 2018:

Issuance	Number of Shares Issuable Upon Exercise of Outstanding Warrants	Exercise Price	Expiration Date
June 2015 Private Placement	393,300	$ 39.80	June 15, 2019
July 2017 Registered Direct Offering	570,784	$ 5.04	January 7, 2024
December 2017 Public Offering - Series A	6,439,000	$ 2.25	December 21, 2022
December 2017 Public Offering - Series B	3,164,402	$ 2.25	September 21, 2018
Consultant	30,000	$ 2.90	September 11, 2024
Total	10,597,486		

During the six months ended June 30, 2018, a total of 55,100 Series B warrants from the December 2017 public offering were exercised resulting in the issuance of 55,100 shares of common stock and the Company's receipt of $124 in cash proceeds.

Reserved Shares

The following shares of common stock were reserved for future issuance upon exercise of stock options, release of RSUs, conversion of Series A Convertible Preferred Stock and conversion of warrants:

	June 30, 2018	December 31, 2017
Stock Options	1,674,107	702,033
RSUs	7,101	14,367
Series A Convertible Preferred Stock	—	811,555
Warrants	10,597,486	10,652,586
Total number of common shares reserved for future issuance	12,278,694	12,180,541

11. RESTRUCTURING

During 2016, the Company initiated a strategic restructuring under which Yield10 Bioscience became its core business and its biopolymer operations were discontinued. As part of its strategic restructuring, the Company significantly reduced staffing levels and in January 2017, the Company formally changed its name to Yield10 Bioscience, Inc.

In connection with the wind down of its biopolymer operations, the Company ceased pilot production of biopolymer materials and reached agreements with the owner-operators of its biopolymer production facilities regarding the termination of these services. Through May 2018, the Company made cash payments of $3,317, issued 27,500 shares of common stock with a fair value of $85 and transferred certain biopolymer-related production equipment with a net book value of $111 to settle these agreements and other restructuring activities. At June 30, 2018, the Company has no further restructuring obligations outstanding.

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 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. 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, the 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; the expected results of our strategic restructuring to focus on Yield10 Bioscience as our core business; expected future financial results and cash requirements; 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 its year ended December 31, 2017 and in our other filings with the Securities and Exchange Commission.

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 Form 10-Q to "Yield10 Bioscience," "Yield10," "we," "our," "us," "our company" or "the company" refer to Yield10 Bioscience, Inc., a Delaware corporation, and its subsidiaries.

Overview

Yield10 Bioscience, Inc. ("Yield10 Bioscience," "Yield10," or the "Company") is an agricultural bioscience company focusing on the development of new technologies to enable step-change increases in crop yield to enhance global food security. We consider 10-20 percent increases in crop yield to be step-change increases. According to a United Nations report, food production must be increased by over 70 percent in the next 35 years to feed the growing global population, which is expected to increase from 7 billion to more than 9.6 billion by 2050. During that time period, there will be a reduction in available arable land as a result of infrastructure growth and increased pressure on scarce water resources. Harvestable food production per acre and per growing season must be increased to meet this demand. At the same time, in light of the increasing focus on health and wellness, food safety and sustainability in developed countries, we anticipate a rise in demand for new varieties of food and food ingredients with improved nutritional properties. Further, concerns about food safety have led to the concept of "seed to plate," or "farm to fork," with a focus on stringent quality control along the entire value chain. If this concept takes hold with consumers, it is likely to require identity preservation from seed to harvest and involve contract farming. This concept has been initially implemented in agricultural biotechnology, in products such as high oleic canola and soybean. Consumer demand for identity preserved specialty ingredients is also expected to rise, and we believe that Yield10's crop yield technologies and crop genome-editing platform could be useful in this emerging field.

The foundation technology of Yield10 is based on using two proprietary advanced biotechnology trait gene discovery platforms to improve fundamental crop yield through enhanced photosynthetic carbon capture and increased carbon utilization efficiency to increase seed yield. These platforms are based on the principle that plants which capture and utilize carbon more efficiently will enable more robust crops capable of increased seed yield. We are working to develop, translate and demonstrate the commercial value of a number of novel yield trait genes from these discovery platforms in major crops. Our "Smart Carbon Grid for Crops" metabolic engineering platform has already proven useful in identifying a number of our C3000 series of traits, including the novel yield trait gene C3003 which is being field tested in Camelina and canola in the 2018 growing season. Our "T3 Platform," is based on mining transcription factor network data sets and led to the identification of our C4001, C4002 and C4003 global transcription factor gene traits. These gene traits enabled us to engineer switchgrass plants with high rates of

photosynthesis and increased biomass yield. We are currently repeating our work with C4001 and C4003 in rice and wheat and plan to do so in corn.

We are currently combining the two trait gene discovery platforms to create an integrated system for identifying key plant gene combinations for modification using genome editing to improve crop performance. Advanced metabolic flux analysis forms the foundation of the GRAIN platform we are developing based on Yield10 scientists unique 20-plus years of experience successfully deploying advanced metabolic flux analysis to address critical bottlenecks in carbon metabolism. Based on elements of the GRAIN platform that we are already working on, we have identified the C4004 through C4027 series of transcription factor genes that are down-regulated in our high-photosynthesis engineered switchgrass plants as well as a number of new gene targets related to our lead C3003 yield trait. New tools for genome-editing continue to develop at a fast pace and be deployed against known targets which for the most part are focused on changing seed or seed oil composition. However, identifying gene combinations remain an unmet need.

On May 17, 2018, we entered into an exclusive worldwide license from the University of Missouri 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 first technology, named C3007, is a gene for a negative controller that inhibits the enzyme activity of Acetyl-CoA carboxylase, or ACCase. The second technology, named C3010, is a gene which, if over-expressed, results in increased activity of ACCase. We are required to use reasonable efforts to develop licensed products throughout the licensed field and to introduce licensed products into the commercial market. In that regard, we are obligated to fulfill certain research, development and regulatory milestones relating to C3007 and C3010, including completion of multi-site field demonstrations of a crop species in which C3007 and C3010 have been introduced, and filing for regulatory approval of a crop species in which C3007 and C3010 have been introduced within a specified period.

During July 2018, the we also entered into a non-exclusive research license agreement jointly with the Broad Institute of MIT and Harvard and Pioneer, part of Corteva Agriscience™, Agriculture Division of DowDupont, for the use of CRISPR-Cas9 genome-editing technology for crops. The joint license covers intellectual property consisting of approximately 48 patents and patent applications on CRISPR-Cas9 technology controlled by the Broad Institute and Corteva Agriscience. Under the agreement, we have the option to renew the license on an annual basis and the right to convert the research license to a commercial license in the future, subject to conditions specified in the agreement. CRISPR technology is uniquely suited to agricultural applications as it enables precise changes to plant DNA without the use of foreign DNA to incorporate new traits. Plants developed using CRISPR genome-editing technology have the potential to be designated as "non-regulated" by USDA-APHIS for development and commercialization in the U.S., which could result in shorter developmental timelines and lower costs associated with commercialization of new traits in the U.S. as compared to regulated crops.

We are currently progressing the development of our lead yield trait genes in canola, soybean, rice and wheat to provide step-change yield solutions for enhancing global food security. Yield10 Bioscience is headquartered in Woburn, Massachusetts and has an additional agricultural science facility with greenhouses in Saskatoon, Saskatchewan, Canada.

As of June 30, 2018, we held unrestricted cash, cash equivalents and short-term investments of $9,654. 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 current cash forecast, we expect that our present capital resources will be sufficient to fund our planned operations and meet our obligations into the third quarter of 2019. 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. We have evaluated the guidance of ASC Topic 205-40 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. 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 our outstanding warrants, additional government grant or collaborative arrangements with third parties, as to which no assurance 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 or if we are unsuccessful in entering into collaborative arrangements for further research, we may be forced to curtail our research efforts, explore strategic alternatives and/or wind down our operations and pursue options for liquidating the Company's remaining assets, including intellectual property and equipment. Based on our cash forecast, we have determined that our present capital resources are unlikely to be sufficient to fund our planned operations for the twelve months from the date that our financial statements are issued, which raises substantial doubt about the Company's ability to continue as a going concern.

If we issue equity or debt securities to raise additional funds, (i) we may incur fees associated with such issuance, (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 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 our 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 of 1986 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 the Company's potential products or proprietary technologies, or grant licenses on terms that are not favorable to the Company.

Government Grants

Our principal source of revenue is government research grants. As of June 30, 2018, $373 remains available under our U.S. government grants. This includes amounts for reimbursement to our subcontractors, as well as reimbursement for our employees' time, benefits and other expenses related to future performance.

On April 17, 2018 we entered into a sub-award with Michigan State University ("MSU") to support a Department of Energy funded grant entitled "A Systems Approach to Increasing Carbon Flux to Seed Oil." Our participation under this grant will be awarded on an annual basis with the first year commencing September 15, 2017 and ending September 14, 2018 for an initial funded amount of $546 . We anticipate that additional option years will be awarded annually to Yield10 through September 14, 2022 for total sub-award funding of $2,957, provided the U.S. Congress continues to appropriate funds for the program, we are able to make progress towards meeting grant objectives and we remain in compliance with other terms and conditions of the sub-award. We commenced work on this grant in September 2017. During our fiscal quarter ended June 30, 2018, total grant revenue of $236 recognized under this award included $108 for work previously performed during the period September 15, 2017 through March 31, 2018.

The status of our government grants is as follows:

Program Title	Funding Agency	Total Government Funds	Total received through June 30, 2018	Remaining amount available as of June 30, 2018	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	$ 546	$ 201	$ 345	September 2018
Production of High Oil, Transgene Free Camelina Sativa Plants through Genome Editing ("Camelina")	Department of Energy	1,997	1,969	28	September 2018
Total		$ 2,543	$ 2,170	$ 373	

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 accounting principles generally accepted in the United States of America 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 compensation and strategic restructuring charges. 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 six months ended June 30, 2018, are consistent with those discussed in our Annual Report on Form 10-K for the year ended December 31, 2017, 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 June 30, 2018 and 2017

Revenue

	Three Months Ended June 30,		
	2018	**2017**	**Change**
Grant revenue	$ 285	$ 293	$ (8)

Grant revenue was $285 and $293 for the three months ended June 30, 2018 and 2017, respectively. Grant revenue for the three months ended June 30, 2018 was derived primarily from the Company's subcontract with MSU. During the three months ended June 30, 2018 the Company recognized revenue of $236 from this award, including $108 of revenue earned as a result of advance work performed from September 15, 2017 through March 31, 2018 prior to our executing the subcontract with MSU in April 2018. During the three months ended June 30, 2017, grant revenue of $293 was earned from the the Company's Camelina grant with DOE.

We anticipate grant revenue will continue to remain lower during 2018 in comparison to 2017 as we complete the the Company's Camelina grant with the DOE. Our new DOE sub-award through MSU is not expected to generate quarterly revenue at the same rate as the expiring Camelina grant.

Expenses

	Three Months Ended June 30,		
	2018	**2017**	**Change**
Research and development expenses	$ 1,253	$ 1,138	$ 115
General and administrative expenses	1,452	1,866	(414)
Total expenses	$ 2,705	$ 3,004	$ (299)

Research and Development Expenses

Research and development expenses were $1,253 and $1,138 for the three months ended June 30, 2018 and June 30, 2017, respectively. The increase of $115 is primarily the result of an increase in employee compensation and benefits of $100 in comparison to the three months ended June 30, 2017 and is the result of hiring new research personnel during 2018 and the recording of a three-month proportional accrual for 2018 employee bonuses that are expected to be paid during Q1 2019.

We expect research and development expenses will continue to be higher during the remainder of 2018 in comparison to 2017 as a result of our expanded field testing for crops across multiple locations and our plans to hire a small number of additional research staff to support our research activities.

General and Administrative Expenses

General and administrative expenses decreased $414 from $1,866 during the three months ended June 30, 2017 to $1,452 during the three months ended June 30, 2018. During the three months ended June 30, 2017 we recognized $622 of previously deferred equity offering costs related to a common stock purchase agreement with Aspire Capital Fund, LLC ("Aspire") that terminated before any shares were sold. This decrease was partially offset during the three months ended June 30, 2018 by an increase in patent related legal fees of $108 and an increase in license fees of $65 as a result of our entering into an exclusive technology license with the University of Missouri.

We expect our general and administrative expenses will be consistent during the remainder of 2018 as we continue to carefully monitor our use of cash resources.

Other Income (Expense), Net

	Three Months Ended June 30,		
	2018	2017	Change
Other income, net	$ 45	$ 2	$ 43
Other expense, net	(15)	(18)	3
Total other income (expense), net	$ 30	$ (16)	$ 46

Other income (expense), net, reflects net income of $30 and net expense of $16 for the three months ended June 30, 2018 and June 30, 2017, respectively. Net income during the second quarter of 2018 is primarily the result of $45 of investment income earned from the Company's short-term investments and higher average cash balances held during the quarter. Other expense, net, of $15 and $18 for the three months ended June 30, 2018 and June 30, 2017, respectively, includes interest charges recorded in connection with installment payments made by the Company related to the early termination of a third party manufacturing agreement that ended in 2016.

Comparison of the Six Months Ended June 30, 2018 and 2017

Revenue

	Six Months Ended June 30,		
	2018	2017	Change
Grant revenue	$ 345	$ 617	$ (272)

Grant revenue was $345 and $617 for the six months ended June 30, 2018 and June 30, 2017, respectively. Grant revenue for the six months ended June 30, 2018 was derived primarily from $236 in revenue recognized for work performed on the Company's subcontract with MSU. During the six months ended June 30, 2017, grant revenue of $587 was earned from the DOE Camelina grant.

Expenses

	Six Months Ended June 30,		
	2018	2017	Change
Research and development expenses	$ 2,347	$ 2,247	$ 100
General and administrative expenses	2,725	3,142	(417)
Total expenses	$ 5,072	$ 5,389	$ (317)

Research and Development Expenses

Research and development expenses increased by $100 from $2,247 during the six months ended June 30, 2017 to $2,347 during the six months ended June 30, 2018. During the six months ended June 30, 2018 employee compensation and benefit expense increased by $210, primarily as a result of hiring new research personnel during 2018 and the recording of a six-month proportional accrual for 2018 employee bonuses. Sponsored research expense decreased by $120 during the six months ended June 30, 2018, primarily as a result of research services performed by North Carolina State University ("NCSU") for us as a sub-awardee under the DOE Camelina grant during the first six months of 2017. NCSU did not perform similar services for us during 2018.

General and Administrative Expenses

General and administrative expenses decreased by $417 from $3,142 during the six months ended June 30, 2017 to $2,725 during the six months ended June 30, 2018. The decrease between the two periods is primarily related to the terminated Aspire stock purchase agreement discussed above, partially offset by an increase in employee compensation and benefits expense of $92 as a result of recording a six-month proportional accrual for 2018 employee bonuses.

Other Income (Expense), Net

	Six Months Ended June 30,		
	2018	2017	Change
Other income, net	$ 80	$ 3	$ 77
Other expense, net	(33)	(50)	17
Total other income (expense), net	$ 47	$ (47)	$ 94

Other income (expense), net, reflects net income of $47 and net expense of $47 for the six months ended June 30, 2018 and June 30, 2017, respectively. Net income during the six months ended December 31, 2018 is primarily the result of $80 of investment income earned from the Company's short-term investments and higher average cash balances held during the six month period. Other expense, net, of $33 and $50 for the six months ended June 30, 2018 and June 30, 2017, respectively, includes interest charges recorded in connection with installment payments made by the Company related to the early termination of a third party manufacturing agreement that ended in 2016.

Liquidity and Capital Resources

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

Since our inception, we have incurred significant expenses related to our research, development and commercialization efforts. With the exception of a single year, we have recorded losses annually since our initial founding, including the three and six months ended June 30, 2018. As of June 30, 2018, we had an accumulated deficit of $347,433. Our total unrestricted cash, cash equivalents and short-term investments as of June 30, 2018, were $9,654 as compared to $14,487 at December 31, 2017. As of June 30, 2018, we had no outstanding debt.

Our cash and cash equivalents are held primarily for working capital purposes. As of June 30, 2018, we had restricted cash of $332. Restricted cash consists of $307 held in connection with the lease agreement for our Woburn, Massachusetts facility and $25 held in connection with corporate credit cards used for incidental purchases.

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 and 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 June 30, 2018, we were in compliance with this policy.

We believe that our existing funds, when combined with cash generated from government grants and our access to additional financing sources, if needed, will be sufficient to fund operations and meet our obligations when due, into the third quarter of 2019. 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 the Company's ability to continue as a going concern for one year after the date its financial statements are issued. Based on our current cash forecast, we have determined that our present capital resources are unlikely to be sufficient to fund our planned operations for the twelve months from the date that our financial statements are issued, which raises substantial doubt about the Company's ability to continue as a going concern.

We have filed a shelf registration statement on Form S-3 with the SEC, covering the sale from time to time of shares of our common stock and other securities, which may provide us the opportunity to raise funds when we consider it necessary or appropriate, at prices and terms to be determined at the time of any such offering. However, pursuant to the instructions on Form S-3, we only have the ability to sell shares under the shelf registration statement, during any 12-month period, in an amount less than or equal to one-third of the aggregate market value of our common stock held by non-affiliates.

During 2016, we completed a strategic restructuring of our operations to focus on the Yield10 Bioscience business. We significantly reduced staffing levels and incurred restructuring costs for contract termination and employee post-termination benefits of approximately $3,513. During May 2018 the final payment was made related to our contract termination obligation and as of June 30, 2018, no further restructuring charges remain outstanding. We currently anticipate that we will use approximately $9,000 to $9,500 of cash during 2018, including the final payments we made for restructuring costs.

We will need additional capital to fully implement our business, operating and development plans and to support our capital needs. The timing, structure and vehicles for obtaining future financing are under consideration, but there can be no

assurance that such financing efforts will be successful. If we do not receive additional funding by mid-2019, we may be forced to wind down our business, or have to delay, scale back or otherwise modify our business plans, research and development activities and other operations, and/or seek strategic alternatives.

If we issue equity or debt securities to raise additional funds, (i) we may incur fees associated with such issuance, (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 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 our existing stockholders. In addition, utilization of our net operating loss and research and development credit carryforwards may be subject to significant annual limitations under Section 382 of the Internal Revenue Code of 1986 due to ownership changes resulting from future equity financing transactions. If we raise additional funds through collaboration, licensing or other similar arrangements, it may be necessary to relinquish valuable rights to our potential products or proprietary technologies, or grant licenses on terms that are not favorable to us.

Net cash used for operating activities was $4,888 during the six months ended June 30, 2018, compared to net cash used for operating activities during the six months ended June 30, 2017 of $4,286. Net cash used for operations during the six months ended June 30, 2018 primarily reflects the net loss of $4,680, payment of 2017 employee bonuses of approximately $529 and payment of final obligations totaling $500 related to the Company's strategic restructuring initiated during 2016, partially offset by non-cash expenses, including stock-based compensation expense of $596, depreciation expense of $96 and a 401(k) stock matching contribution expense of $70.

Net cash of $6,520 was used by investing activities during the six months ended June 30, 2018. During the six months ended June 30, 2018, we purchased $7,986 in short-term investments, including U.S. Treasury notes and federal agency bonds. During that period $1,500 of short-term investments matured and converted to cash.

Net cash of $118 was provided by financing activities during the six months ended June 30, 2018, primarily from investor exercises of warrants during the period.

Off-Balance Sheet Arrangements

As of June 30, 2018, we had no off-balance sheet arrangements as defined in Item 303(a)(4) of the Securities and Exchange Commission’s Regulation S-K.

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 Securities Exchange Act of 1934, as amended (the "Exchange Act")), as of June 30, 2018. 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 June 30, 2018 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 in information regarding our risk factors as described in Item 1A of our Annual Report on Form 10-K for the year ended December 31, 2017. Our business is subject to numerous risks. We caution you that the important factors annotated within our risk factors, among others, could cause our actual results to differ materially from those expressed in forward-looking statements made by us or on our behalf in filings with the Securities and Exchange Commission, press releases, communications with investors and oral statements. Any or all of our forward-looking statements in this Quarterly Report on Form 10-Q and any other public statements we make may turn out to be wrong. They can be affected by inaccurate assumptions we might make or by known or unknown risks and uncertainties. Many factors discussed in our risk factors will be important in determining future results. Consequently, no forward-looking statement can be guaranteed. Actual future results may differ materially from those anticipated in forward-looking statements. We undertake no obligation to update any forward-looking statements, whether as a result of new information, future events or otherwise, other than as required under the federal securities laws. You are advised, however, to consult any further disclosure we make in our reports filed with the Securities and Exchange Commission.

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

Recent Sales of Unregistered Securities

On April 2, 2018, we issued 19,121 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 of 1933, as amended as exempted securities.

Issuer Purchases of Equity Securities

During the three months ended June 30, 2018, 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 Certificate of Incorporation, as amended, of the Registrant (filed herewith).
10.1	†	2018 Stock Option and Incentive Plan (filed herewith).
10.2		Exclusive License Agreement, dated May 17, 2018, between the Company and the University of Missouri. (Confidential portions of this exhibit have been omitted and filed separately with the Securities and Exchange Commission pursuant to a request for confidential treatment.) (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 June 30, 2018 formatted in XBRL: (i) Condensed Consolidated Balance Sheets, June 30, 2018 and December 31, 2017; (ii) Condensed Consolidated Statements of Operations, Three and Six Months Ended June 30, 2018 and 2017; (iii) Condensed Consolidated Statements of Comprehensive Loss, Three and Six Months Ended June 30, 2018 and 2017; (iv) Condensed Consolidated Statements of Cash Flows, Six Months Ended June 30, 2018 and 2017; and (v) Notes to Consolidated Financial Statements.

† Indicates a management contract or any compensatory plan, contract or arrangement.

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.

August 9, 2018 By: /s/ OLIVER PEOPLES

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

August 9, 2018 By: /s/ CHARLES B. HAASER

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

Exhibit 3.1

CERTIFICATE OF AMENDMENT

OF

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION

OF

YIELD10 BIOSCIENCE, INC.

Pursuant to Section 242 of the
General Corporation Law of the State of Delaware

YIELD10 BIOSCIENCE, Inc., a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify as follows:

1. The name of the corporation (hereinafter called the **"Corporation"**) is Yield10 Bioscience, Inc.

2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 1, 1998. An Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on November 15, 2006 and thereafter Certificates of Designation were filed on July 8, 2009 and August 22, 2014 with the Secretary of State of the State of Delaware and Certificates of Amendment were filed on October 30, 2014 and May 26, 2015 with the Secretary of State of the State of Delaware and a Certificate of Designation was filed on September 11, 2015 with the Secretary of State of the State of Delaware. Certificates of Amendment were filed on January 6, 2017 and May 25, 2017 with the Secretary of State of the State of Delaware. A Certificate of Designation was filed on December 19, 2017 with the Secretary of State of the State of Delaware. A Certificate of Amendment was filed on December 27, 2017 with the Secretary of State of the State of Delaware.

3. The first paragraph of Article IV of the Corporation's Amended and Restated Certificate of Incorporation, as amended, is hereby deleted and replaced in its entirety with:

> "The total number of shares of capital stock which the Corporation shall have authority to issue is sixty-five million (65,000,000) shares, of which (i) sixty million (60,000,000) shares shall be a class designated as common stock, par value $.01 per share (the "Common Stock"), and (ii) four million nine hundred ninety-six thousand thirteen (4,996,013) shares shall be a class designated as undesignated preferred stock, par value $.01 per share (the "Undesignated Preferred Stock"), and (iii) three thousand nine hundred eighty-seven (3,987)

shares shall be a class designated as Series A convertible preferred stock, par value $.01 per share.

4. The Board of Directors of the Corporation has duly adopted resolutions (i) authorizing the Corporation to execute and file with the Secretary of State of the State of Delaware this Certificate of Amendment, and (ii) declaring this Certificate of Amendment to be advisable and recommended for approval by the stockholders of the Corporation.

5. This Certificate of Amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware by the Board of Directors and stockholders of the Corporation.

6. This Certificate of Amendment shall take effect on May 23, 2018.

[Remainder of this page intentionally left blank.]

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to Certificate of Incorporation to be signed by its duly authorized President and Chief Executive Officer this 23rd day of May, 2018.

YIELD10 BIOSCIENCE, INC.

By:	/s/ Oliver P. Peoples
Name:	Oliver P. Peoples, Ph.D.
Title:	President & Chief Executive Officer

CERTIFICATE OF AMENDMENT

OF

AMENDED AND RESTATED CERTIFICATE OF INCORPORATION

OF

YIELD10 BIOSCIENCE, INC.

Pursuant to Section 242 of the
General Corporation Law of the State of Delaware

YIELD10 BIOSCIENCE, INC., a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify as follows:

1. The name of the corporation (hereinafter called the **"Corporation"**) is Yield10 Bioscience, Inc.

2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 1, 1998. An Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on November 15, 2006 and thereafter Certificates of Designation were filed on July 8, 2009 and August 22, 2014 with the Secretary of State of the State of Delaware and Certificates of Amendment were filed on October 30, 2014 and May 26, 2015 with the Secretary of State of the State of Delaware and a Certificate of Designation was filed on September 11, 2015 with the Secretary of State of the State of Delaware. Certificates of Amendment were filed on January 6, 2017 and May 25, 2017 with the Secretary of State of the State of Delaware. A Certificate of Designation was filed on December 19, 2017 with the Secretary of State of the State of Delaware.

3. The first paragraph of Article IV of the Corporation's Amended and Restated Certificate of Incorporation, as amended, is hereby deleted and replaced in its entirety with:

> "The total number of shares of capital stock which the Corporation shall have authority to issue is forty-five million (45,000,000) shares, of which (i) forty million (40,000,000) shares shall be a class designated as common stock, par value $.01 per share (the "Common Stock"), (ii) four million nine hundred ninety-six thousand thirteen (4,996,013) shares shall be a class designated as undesignated preferred stock, par value $.01 per share (the "Undesignated Preferred Stock"), and (iii) three thousand nine hundred eighty-seven (3,987) shares shall be a class designated as Series A convertible preferred stock", par value $.01 per share.

4. The Board of Directors of the Corporation has duly adopted resolutions (i) authorizing the Corporation to execute and file with the Secretary of State of the State of Delaware this Certificate of Amendment, and (ii) declaring this Certificate of Amendment to be advisable and recommended for approval by the stockholders of the Corporation.

5. This Certificate of Amendment was duly adopted in accordance with the provisions of Section 242 of the General Corporation Law of the State of Delaware by the Board of Directors and stockholders of the Corporation.

6. This Certificate of Amendment shall take effect on December 27, 2017.

[Remainder of this page intentionally left blank.]

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to Certificate of Incorporation to be signed by its duly authorized President and Chief Executive Officer this 27th day of December, 2017.

YIELD10 BIOSCIENCE, INC.

By:	/s/ Oliver P. Peoples
Name:	Oliver P. Peoples, Ph.D.
Title:	President & Chief Executive Officer

YIELD10 BIOSCIENCE, INC.

CERTIFICATE OF DESIGNATION OF PREFERENCES,
RIGHTS AND LIMITATIONS
OF
SERIES A CONVERTIBLE PREFERRED STOCK

PURSUANT TO SECTION 151 OF THE
DELAWARE GENERAL CORPORATION LAW

The undersigned, Oliver P. Peoples and Charles B. Haaser, do hereby certify that:

1. They are the President and Assistant Secretary, respectively, of Yield10 Bioscience, Inc., a Delaware corporation (the "Corporation").

2. The Corporation is authorized to issue 5,000,000 shares of preferred stock, none of which have been issued.

3. The following resolutions were duly adopted by the board of directors of the Corporation (the "Board of Directors"):

WHEREAS, the certificate of incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, consisting of 5,000,000 shares, $0.01 par value per share, issuable from time to time in one or more series;

WHEREAS, the Board of Directors is authorized to fix the dividend rights, dividend rate, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of preferred stock and the number of shares constituting any series and the designation thereof, of any of them; and

WHEREAS, it is the desire of the Board of Directors, pursuant to its authority as aforesaid, to fix the rights, preferences, restrictions and other matters relating to a series of the preferred stock, which shall consist of, except as otherwise set forth in the Underwriting Agreement, up to 3,987 shares of the preferred stock which the Corporation has the authority to issue, as follows:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby provide for the issuance of a series of preferred stock for cash or exchange of other securities, rights or property and does hereby fix and determine the rights, preferences, restrictions and other matters relating to such series of preferred stock as follows:

TERMS OF PREFERRED STOCK

Section 1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(d).

"Beneficial Ownership Limitation" shall have the meaning set forth in Section 6(d).

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

"Buy-In" shall have the meaning set forth in Section 6(c)(iv).

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the Corporation's common stock, par value $0.01 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Corporation or the Subsidiaries which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

"Conversion Amount" means the sum of the Stated Value at issue.

"Conversion Date" shall have the meaning set forth in Section 6(a).

"Conversion Price" shall have the meaning set forth in Section 6(b).

"Conversion Shares" means, collectively, the shares of Common Stock issuable upon conversion of the shares of Preferred Stock in accordance with the terms hereof.

"Equity Conditions" means, during the period in question, (a) the Corporation shall have duly honored all conversions scheduled to occur or occurring by virtue of one or more Notices of Conversion of the applicable Holder on or prior to the dates so requested or required, if any, (b) the Corporation shall have paid all liquidated damages and other amounts

owing to the applicable Holder in respect of the Preferred Stock, (c)(i) there is an effective registration statement pursuant to which either (A) the Corporation may issue Conversion Shares or (B) the Holders are permitted to utilize the prospectus thereunder to resell all of the shares of Common Stock issuable pursuant to the Transaction Documents (and the Corporation believes, in good faith, that such effectiveness will continue uninterrupted for the foreseeable future) or (ii) all of the Conversion Shares may be issued to the Holder pursuant to Section 3(a)(9) of the Securities Act and immediately resold without restriction, (d) the Common Stock is trading on a Trading Market and all of the shares issuable pursuant to the Transaction Documents are listed or quoted for trading on such Trading Market (and the Corporation believes, in good faith, that trading of the Common Stock on a Trading Market will continue uninterrupted for the foreseeable future), (e) there is a sufficient number of authorized, but unissued and otherwise unreserved, shares of Common Stock for the issuance of all of the shares then issuable pursuant to the Transaction Documents, (f) the issuance of the shares in question to the applicable Holder would not violate the limitations set forth in Section 6(d) herein and (g) the applicable Holder is not in possession of any information provided by the Corporation, any of its Subsidiaries, or any of their officers, directors, employees, agents or Affiliates, that constitutes, or may constitute, material non-public information.

"Exchange Act" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"Forced Conversion Date" shall have the meaning set forth in Section 6(e).

"Forced Conversion Notice" shall have the meaning set forth in Section 6(e).

"Forced Conversion Notice Date" shall have the meaning set forth in Section 6(e).

"Fundamental Transaction" shall have the meaning set forth in Section 7(d).

"GAAP" means United States generally accepted accounting principles.

"Holder" shall have the meaning given such term in Section 2.

"Liquidation" shall have the meaning set forth in Section 5.

"New York Courts" shall have the meaning set forth in Section 8(d).

"Notice of Conversion" shall have the meaning set forth in Section 6(a).

"Original Issue Date" means the date of the first issuance of any shares of the Preferred Stock regardless of the number of transfers of any particular shares of Preferred Stock and regardless of the number of certificates which may be issued to evidence such Preferred Stock.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Preferred Stock" shall have the meaning set forth in Section 2.

"Representative" means Ladenburg Thalmann & Co. Inc.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Share Delivery Date" shall have the meaning set forth in Section 6(c).

"Stated Value" shall have the meaning set forth in Section 2, as the same may be increased pursuant to Section 3.

"Successor Entity" shall have the meaning set forth in Section 7(d).

"Trading Day" means a day on which the principal Trading Market is open for business.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE American, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, or the New York Stock Exchange (or any successors to any of the foregoing).

"Transfer Agent" means American Stock Transfer & Trust Company, LLC, the current transfer agent of the Corporation with a mailing address of 6201 15th Avenue, Brooklyn, New York 11219, and a facsimile number of (718) 765-8712, and any successor transfer agent of the Corporation.

"Underwriting Agreement" means the underwriting agreement, dated as of December 19, 2017, among the Corporation and the Representative, as representative of the underwriters named therein, as amended, modified or supplemented from time to time in accordance with its terms.

"VWAP" means, for any date, the price determined by the first of the following clauses that applies: (a) if the Common Stock is then listed or quoted on a Trading Market, the daily volume weighted average price of the Common Stock for such date (or the nearest preceding date) on the Trading Market on which the Common Stock is then listed or quoted as reported by Bloomberg L.P. (based on a Trading Day from 9:30 a.m. (New York City time) to 4:02 p.m. (New York City time)), (b) if OTCQB or OTCQX is not a Trading Market, the volume weighted average price of the Common Stock for such date (or the nearest preceding date) on OTCQB or OTCQX as applicable, (c) if the Common Stock is not then

listed or quoted for trading on OTCQB or OTCQX and if prices for the Common Stock are then reported in the "Pink Sheets" published by OTC Markets, Inc. (or a similar organization or agency succeeding to its functions of reporting prices), the most recent bid price per share of the Common Stock so reported, or (d) in all other cases, the fair market value of a share of Common Stock as determined by an independent appraiser selected in good faith by the Holders of a majority in interest of the Preferred Stock then outstanding and reasonably acceptable to the Corporation, the fees and expenses of which shall be paid by the Corporation.

Section 2. Designation, Amount and Par Value. The series of preferred stock shall be designated as the Corporation's Series A Convertible Preferred Stock (the "Preferred Stock") and the number of shares so designated shall be up to 3,987 (which shall not be subject to increase without the written consent of all of the holders of the then-outstanding shares of Preferred Stock (each, a "Holder" and collectively, the "Holders")). Each share of Preferred Stock shall have a par value of $0.01 per share and a stated value equal to $1,000, subject to increase set forth in Section 3 below (the "Stated Value"). The Preferred Stock will initially be issued in book-entry form and shall initially be represented only by one or more global certificates deposited with the Depository Trust Company ("DTC") and registered in the name of Cede & Co., a nominee of DTC, or as otherwise directed by DTC. In addition, a beneficial owner of Preferred Stock has the right, upon written notice by such beneficial owner to the Corporation, to request the exchange of some or all of such beneficial owner's interest in Preferred Stock represented by one or more global Preferred Stock certificates deposited with Cede & Co. (or its successor) for a physical Preferred Stock certificate (a "Preferred Stock Certificate Request Notice" and the date of delivery of such Preferred Stock Certificate Request Notice by a beneficial owner, the "Preferred Stock Certificate Request Notice Date" and the deemed surrender upon delivery by the beneficial owner of a number of global shares of Preferred Stock for the same number of shares of Preferred Stock represented by a physical stock certificate, a "Preferred Stock Exchange", and such physical certificate(s), a "Preferred Stock Certificate"). Upon delivery of a Preferred Stock Certificate Request Notice, the Corporation shall promptly effect the Preferred Stock Exchange and shall promptly issue and deliver to the beneficial owner a physical Preferred Stock Certificate for such number of shares of Preferred Stock represented by its interest in such global certificates in the name of the beneficial owner. Such Preferred Stock Certificate shall be dated the original issue date and shall be executed by an authorized signatory of the Corporation. In connection with a Preferred Stock Exchange, the Corporation agrees to deliver the Preferred Stock Certificate to the Holder within two (2) Business Days of the delivery of a properly completed and executed Preferred Stock Certificate Request Notice pursuant to the delivery instructions in the Preferred Stock Certificate Request Notice. The Corporation covenants and agrees that, upon the date of delivery of the properly completed and executed Preferred Stock Certificate Request Notice, the Holder shall be deemed to be the holder of the Preferred Stock Certificate and, notwithstanding anything to the contrary set forth herein, the Preferred Stock Certificate shall be deemed for all purposes to represent all of the terms and conditions of the Preferred Stock evidenced by such global Preferred Stock certificates and the terms hereof.

Section 3. Dividends. Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, Holders shall be entitled to receive, and the

Corporation shall pay, dividends on shares of Preferred Stock equal (on an as-if-converted-to-Common-Stock basis, disregarding for such purpose any conversion limitations hereunder) to and in the same form as dividends actually paid on shares of the Common Stock when, as and if such dividends are paid on shares of the Common Stock. No other dividends shall be paid on shares of Preferred Stock. The Corporation shall not pay any dividends on the Common Stock unless the Corporation simultaneously complies with this provision.

Section 4. Voting Rights. Except as otherwise provided herein or as otherwise required by law, the Preferred Stock shall have no voting rights. However, as long as any shares of Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) amend its certificate of incorporation or other charter documents in any manner that adversely affects any rights of the Holders, (c) increase the number of authorized shares of Preferred Stock, or (d) enter into any agreement with respect to any of the foregoing.

Section 5. Liquidation. Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation the same amount that a holder of Common Stock would receive if the Preferred Stock were fully converted (disregarding for such purposes any conversion limitations hereunder) to Common Stock which amounts shall be paid pari passu with all holders of Common Stock. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Section 6. Conversion.

a) Conversions at Option of Holder. Each share of Preferred Stock shall be convertible, at any time and from time to time from and after the Original Issue Date at the option of the Holder thereof, into that number of shares of Common Stock (subject to the limitations set forth in Section 6(d)) determined by dividing the Stated Value of such share of Preferred Stock by the Conversion Price. Holders shall effect conversions by providing the Corporation with the form of conversion notice attached hereto as Annex A (a "Notice of Conversion"). Each Notice of Conversion shall specify the number of shares of Preferred Stock to be converted, the number of shares of Preferred Stock owned prior to the conversion at issue, the number of shares of Preferred Stock owned subsequent to the conversion at issue and the date on which such conversion is to be effected, which date may not be prior to the date the applicable Holder delivers by facsimile or e-mail such Notice of Conversion to the Corporation (such date, the "Conversion Date"). If no Conversion Date is specified in a Notice of Conversion, the Conversion Date shall be the date that such Notice of Conversion to the Corporation is deemed delivered hereunder. No ink-original Notice of Conversion shall be required, nor shall any medallion guarantee (or other type of guarantee or notarization) of any Notice of Conversion form be required. The calculations and entries set forth in the Notice of Conversion shall control in the absence of manifest or mathematical error. To effect conversions of shares of Preferred Stock, a Holder shall not be required to surrender the certificate(s) representing the shares of Preferred Stock to the Corporation

unless all of the shares of Preferred Stock represented thereby are so converted, in which case such Holder shall deliver the certificate representing such shares of Preferred Stock promptly following the Conversion Date at issue. Shares of Preferred Stock converted into Common Stock or redeemed in accordance with the terms hereof shall be canceled and shall not be reissued. Notwithstanding the foregoing in this Section 6(a), a holder whose interest in the Preferred Stock is a beneficial interest in certificate(s) representing the Preferred Stock held in book-entry form through DTC (or another established clearing corporation performing similar functions), shall effect conversions made pursuant to this Section 6(a) by delivering to DTC (or such other clearing corporation, as applicable) the appropriate instruction form for conversion, complying with the procedures to effect conversions that are required by DTC (or such other clearing corporation, as applicable), subject to a Holder's right to elect to receive Preferred Stock in certificated form pursuant to Section 2, in which case this sentence shall not apply, and, provided, however, as between the Corporation and a beneficial owner of Preferred Stock held in book-entry form through DTC (or another established clearing corporation performing similar functions) shall have all of the rights and remedies of a "Holder" hereunder.

b) Conversion Price. The conversion price for the Preferred Stock shall equal $2.25, subject to adjustment as provided for herein (the "Conversion Price").

c) Mechanics of Conversion

i. Delivery of Conversion Shares Upon Conversion. Not later than the earlier of (i) two (2) Trading Days and (ii) the number of Trading Days comprising the Standard Settlement Period (as defined below) after each Conversion Date (the "Share Delivery Date"), the Corporation shall deliver, or cause to be delivered, to the converting Holder (A) the number of Conversion Shares being acquired upon the conversion of the Preferred Stock, which Conversion Shares shall be free of restrictive legends and trading restrictions, and (B) a bank check in the amount of accrued and unpaid dividends, if any. The Corporation shall use its best efforts to deliver the Conversion Shares required to be delivered by the Corporation under this Section 6 electronically through the Depository Trust Company or another established clearing corporation performing similar functions. As used herein, "Standard Settlement Period" means the standard settlement period, expressed in a number of Trading Days, on the Corporation's primary Trading Market with respect to the Common Stock as in effect on the date of delivery of the Notice of Conversion. Notwithstanding the foregoing, with respect to any Notice(s) of Conversion delivered by 12:00 p.m. (New York City time) on the Original Issue Date, the Corporation agrees to deliver the Conversion Shares subject to such notice(s) by 4:00 p.m. (New York City time) on the Original Issue Date.

ii. Failure to Deliver Conversion Shares. If, in the case of any Notice of Conversion, such Conversion Shares are not delivered to or as directed by the applicable Holder by the Share Delivery Date, the Holder shall be entitled to elect by written notice to the Corporation at any time on or before its receipt of such

Conversion Shares, to rescind such Conversion, in which event the Corporation shall promptly return to the Holder any original Preferred Stock certificate delivered to the Corporation and the Holder shall promptly return to the Corporation the Conversion Shares issued to such Holder pursuant to the rescinded Notice of Conversion.

iii. Obligation Absolute; Partial Liquidated Damages. The Corporation's obligation to issue and deliver the Conversion Shares upon conversion of Preferred Stock in accordance with the terms hereof are absolute and unconditional, irrespective of any action or inaction by a Holder to enforce the same, any waiver or consent with respect to any provision hereof, the recovery of any judgment against any Person or any action to enforce the same, or any setoff, counterclaim, recoupment, limitation or termination, or any breach or alleged breach by such Holder or any other Person of any obligation to the Corporation or any violation or alleged violation of law by such Holder or any other person, and irrespective of any other circumstance which might otherwise limit such obligation of the Corporation to such Holder in connection with the issuance of such Conversion Shares; provided, however, that such delivery shall not operate as a waiver by the Corporation of any such action that the Corporation may have against such Holder. In the event a Holder shall elect to convert any or all of the Stated Value of its Preferred Stock, the Corporation may not refuse conversion based on any claim that such Holder or any one associated or affiliated with such Holder has been engaged in any violation of law, agreement or for any other reason, unless an injunction from a court, on notice to Holder, restraining and/or enjoining conversion of all or part of the Preferred Stock of such Holder shall have been sought and obtained, and the Corporation posts a surety bond for the benefit of such Holder in the amount of 110% of the Stated Value of Preferred Stock which is subject to the injunction, which bond shall remain in effect until the completion of arbitration/litigation of the underlying dispute and the proceeds of which shall be payable to such Holder to the extent it obtains judgment. In the absence of such injunction, the Corporation shall issue Conversion Shares and, if applicable, cash, upon a properly noticed conversion. If the Corporation fails to deliver to a Holder such Conversion Shares pursuant to Section 6(c)(i) by the Share Delivery Date applicable to such conversion, the Corporation shall pay to such Holder, in cash, as liquidated damages and not as a penalty, for each $5,000 of Stated Value of Preferred Stock being converted, $25 per Trading Day (increasing to $50 per Trading Day on the third Trading Day and increasing to $100 per Trading Day on the sixth Trading Day after such damages begin to accrue) for each Trading Day after the Share Delivery Date until such Conversion Shares are delivered or Holder rescinds such conversion. Nothing herein shall limit a Holder's right to pursue actual damages for the Corporation's failure to deliver Conversion Shares within the period specified herein and such Holder shall have the right to pursue all remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief. The exercise of any such rights shall not prohibit a Holder from seeking to enforce damages pursuant to any other Section hereof or under applicable law.

iv. Compensation for Buy-In on Failure to Timely Deliver Conversion Shares Upon Conversion. In addition to any other rights available to the Holder, if the Corporation fails for any reason to deliver to a Holder the applicable Conversion Shares by the Share Delivery Date pursuant to Section 6(c)(i), and if after such Share Delivery Date such Holder is required by its brokerage firm to purchase (in an open market transaction or otherwise), or the Holder's brokerage firm otherwise purchases, shares of Common Stock to deliver in satisfaction of a sale by such Holder of the Conversion Shares which such Holder was entitled to receive upon the conversion relating to such Share Delivery Date (a "Buy-In"), then the Corporation shall (A) pay in cash to such Holder (in addition to any other remedies available to or elected by such Holder) the amount, if any, by which (x) such Holder's total purchase price (including any brokerage commissions) for the Common Stock so purchased exceeds (y) the product of (1) the aggregate number of shares of Common Stock that such Holder was entitled to receive from the conversion at issue multiplied by (2) the actual sale price at which the sell order giving rise to such purchase obligation was executed (including any brokerage commissions) and (B) at the option of such Holder, either reissue (if surrendered) the shares of Preferred Stock equal to the number of shares of Preferred Stock submitted for conversion (in which case, such conversion shall be deemed rescinded) or deliver to such Holder the number of shares of Common Stock that would have been issued if the Corporation had timely complied with its delivery requirements under Section 6(c)(i). For example, if a Holder purchases shares of Common Stock having a total purchase price of $11,000 to cover a Buy-In with respect to an attempted conversion of shares of Preferred Stock with respect to which the actual sale price of the Conversion Shares (including any brokerage commissions) giving rise to such purchase obligation was a total of $10,000 under clause (A) of the immediately preceding sentence, the Corporation shall be required to pay such Holder $1,000. The Holder shall provide the Corporation written notice indicating the amounts payable to such Holder in respect of the Buy-In and, upon request of the Corporation, evidence of the amount of such loss. Nothing herein shall limit a Holder's right to pursue any other remedies available to it hereunder, at law or in equity including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Corporation's failure to timely deliver the Conversion Shares upon conversion of the shares of Preferred Stock as required pursuant to the terms hereof.

v. Reservation of Shares Issuable Upon Conversion. The Corporation covenants that it will at all times reserve and keep available out of its authorized and unissued shares of Common Stock for the sole purpose of issuance upon conversion of the Preferred Stock as herein provided, free from preemptive rights or any other actual contingent purchase rights of Persons other than the Holder (and the other holders of the Preferred Stock), not less than such aggregate number of shares of the Common Stock as shall be issuable (taking into account the adjustments and restrictions of Section 7) upon the conversion of the then outstanding shares of Preferred Stock. The Corporation covenants that all shares of Common Stock that

shall be so issuable shall, upon issue, be duly authorized, validly issued, fully paid and nonassessable.

vi. Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall round up to the next whole share.

vii. Transfer Taxes and Expenses. The issuance of Conversion Shares on conversion of this Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such Conversion Shares, provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such Conversion Shares upon conversion in a name other than that of the Holders of such shares of Preferred Stock and the Corporation shall not be required to issue or deliver such Conversion Shares unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid. The Corporation shall pay all Transfer Agent fees required for same-day processing of any Notice of Conversion and all fees to the Depository Trust Company (or another established clearing corporation performing similar functions) required for same-day electronic delivery of the Conversion Shares.

d) Beneficial Ownership Limitation. The Corporation shall not effect any conversion of the Preferred Stock, and a Holder shall not have the right to convert any portion of the Preferred Stock, to the extent that, after giving effect to the conversion set forth on the applicable Notice of Conversion, such Holder (together with such Holder's Affiliates, and any Persons acting as a group together with such Holder or any of such Holder's Affiliates (such Persons, "Attribution Parties")) would beneficially own in excess of the Beneficial Ownership Limitation (as defined below). For purposes of the foregoing sentence, the number of shares of Common Stock beneficially owned by such Holder and its Affiliates and Attribution Parties shall include the number of shares of Common Stock issuable upon conversion of the Preferred Stock with respect to which such determination is being made, but shall exclude the number of shares of Common Stock which are issuable upon (i) conversion of the remaining, unconverted Stated Value of Preferred Stock beneficially owned by such Holder or any of its Affiliates or Attribution Parties and (ii) exercise or conversion of the unexercised or unconverted portion of any other securities of the Corporation subject to a limitation on conversion or exercise analogous to the limitation contained herein (including, without limitation, the Preferred Stock) beneficially owned by such Holder or any of its Affiliates or Attribution Parties. Except as set forth in the preceding sentence, for purposes of this Section 6(d), beneficial ownership shall be calculated in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. Subject to a Holder's right to rely on the number of outstanding shares of Common Stock as set forth below, the Corporation makes no representation to the

Holder that its calculations are in compliance with Section 13(d) of the Exchange Act and that the Holder is solely responsible for any schedules required to be filed in accordance therewith. To the extent that the limitation contained in this Section 6(d) applies, the determination of whether the Preferred Stock is convertible (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and of how many shares of Preferred Stock are convertible shall be in the sole discretion of such Holder, and the submission of a Notice of Conversion shall be deemed to be such Holder's determination of whether the shares of Preferred Stock may be converted (in relation to other securities owned by such Holder together with any Affiliates and Attribution Parties) and how many shares of the Preferred Stock are convertible, in each case subject to the Beneficial Ownership Limitation. To ensure compliance with this restriction, each Holder will be deemed to represent to the Corporation each time it delivers a Notice of Conversion that such Notice of Conversion has not violated the restrictions set forth in this paragraph and the Corporation shall have no obligation to verify or confirm the accuracy of such determination. In addition, a determination as to any group status as contemplated above shall be determined in accordance with Section 13(d) of the Exchange Act and the rules and regulations promulgated thereunder. For purposes of this Section 6(d), in determining the number of outstanding shares of Common Stock, a Holder may rely on the number of outstanding shares of Common Stock as stated in the most recent of the following: (i) the Corporation's most recent periodic or annual report filed with the Commission, as the case may be, (ii) a more recent public announcement by the Corporation or (iii) a more recent written notice by the Corporation or the Transfer Agent setting forth the number of shares of Common Stock outstanding. Upon the written or oral request (which may be via email) of a Holder, the Corporation shall within one Trading Day confirm orally and in writing to such Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Corporation, including the Preferred Stock, by such Holder or its Affiliates or Attribution Parties since the date as of which such number of outstanding shares of Common Stock was reported. The "Beneficial Ownership Limitation" shall be 4.99% (or, upon election by a Holder prior to the issuance of any shares of Preferred Stock, 9.99%) of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock issuable upon conversion of Preferred Stock held by the applicable Holder. A Holder, upon notice to the Corporation, may increase or decrease the Beneficial Ownership Limitation provisions of this Section 6(d) applicable to its Preferred Stock provided that the Beneficial Ownership Limitation in no event exceeds 9.99% of the number of shares of the Common Stock outstanding immediately after giving effect to the issuance of shares of Common Stock upon conversion of this Preferred Stock held by the Holder and the provisions of this Section 6(d) shall continue to apply. Any such increase in the Beneficial Ownership Limitation will not be effective until the 61st day after such notice is delivered to the Corporation and shall only apply to such Holder and no other Holder. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 6(d) to correct this paragraph (or any portion hereof) which may be defective or inconsistent with the intended Beneficial Ownership Limitation contained herein or to make changes or supplements necessary or

desirable to properly give effect to such limitation. The limitations contained in this paragraph shall apply to a successor holder of Preferred Stock.

e) Forced Conversion. Notwithstanding anything herein to the contrary, if after the Original Issue Date, the VWAP during any 30 consecutive Trading Day period, which thirty (30) consecutive Trading Day period shall have commenced only after the Original Issue Date (the "Threshold Period"), exceeds $6.75 (subject to adjustment for forward and reverse stock splits, recapitalizations, stock dividends and the like after the Original Issue Date) and (ii) the daily dollar trading volume for such Threshold Period exceeds $175,000 per Trading Day, the Corporation may, within one (1) Trading Day after the end of any such Threshold Period, deliver a written notice to all Holders (a "Forced Conversion Notice" and the date such notice is delivered to all Holders, the "Forced Conversion Notice Date") to cause each Holder to convert all or part of such Holder's Preferred Stock (as specified in such Forced Conversion Notice) pursuant to Section 6, it being agreed that the "Conversion Date" for purposes of Section 6 shall be deemed to occur on the third Trading Day following the Forced Conversion Notice Date (such third Trading Day, the "Forced Conversion Date"). The Corporation may not deliver a Forced Conversion Notice, and any Forced Conversion Notice delivered by the Corporation shall not be effective, unless all of the Equity Conditions have been met on each Trading Day during the applicable Threshold Period through and including the later of the Forced Conversion Date and the Trading Day after the date that the Conversion Shares issuable pursuant to such conversion are actually delivered to the Holders pursuant to the Forced Conversion Notice. Any Forced Conversion Notices shall be applied ratably to all of the Holders based on the then outstanding shares of Preferred Stock. For purposes of clarification, a Forced Conversion shall be subject to all of the provisions of Section 6, including, without limitation, the provisions requiring payment of liquidated damages and limitations on conversions.

Section 7. Certain Adjustments.

a) Stock Dividends and Stock Splits. If the Corporation, at any time while this Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, this Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of a reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive

such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a) above, if at any time the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Preferred Stock (without regard to any limitations on exercise hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights (provided, however, to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Purchase Right to such extent (or beneficial ownership of such shares of Common Stock as a result of such Purchase Right to such extent) and such Purchase Right to such extent shall be held in abeyance for the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

c) Pro Rata Distributions. During such time as this Preferred Stock is outstanding, if the Corporation declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of this Preferred Stock, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete conversion of this Preferred Stock (without regard to any limitations on conversion hereof, including without limitation, the Beneficial Ownership Limitation) immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, to the extent that the Holder's right to participate in any such Distribution would result in the Holder exceeding the Beneficial Ownership Limitation, then the Holder shall not be entitled to participate in such Distribution to such extent (or in the beneficial ownership of any shares of Common Stock as a result of such Distribution to such extent) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time, if ever, as its right thereto would not result in the Holder exceeding the Beneficial Ownership Limitation).

d) Fundamental Transaction. If, at any time while this Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a "Fundamental Transaction"), then, upon any subsequent conversion of this Preferred Stock, the Holder shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 6(d) on the conversion of this Preferred Stock), the number of shares of Common Stock of the successor or acquiring corporation or of the Corporation, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which this Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any limitation in Section 6(d) on the conversion of this Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the Holder shall be given the same choice as to the Alternate Consideration it receives upon any conversion of this Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders' right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the "Successor Entity") to assume in writing all of the

obligations of the Corporation under this Certificate of Designation in accordance with the provisions of this Section 7(d) pursuant to written agreements in form and substance reasonably satisfactory to the Holder and approved by the Holder (without unreasonable delay) prior to such Fundamental Transaction and shall, at the option of the Holder, deliver to the Holder in exchange for this Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to this Preferred Stock which is convertible for a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of this Preferred Stock (without regard to any limitations on the conversion of this Preferred Stock) prior to such Fundamental Transaction, and with a conversion price which applies the conversion price hereunder to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of this Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holder. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation with the same effect as if such Successor Entity had been named as the Corporation herein.

e) Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 1/100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the sum of the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

f) Notice to the Holders.

i. Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder by facsimile or email a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

ii. Notice to Allow Conversion by Holder. If (A) the Corporation shall declare a dividend (or any other distribution in whatever form) on the Common Stock, (B) the Corporation shall declare a special nonrecurring cash dividend on or a redemption of the Common Stock, (C) the Corporation shall authorize the granting to all holders of the Common Stock of rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (D) the approval of any stockholders of the Corporation shall be required in connection with any

reclassification of the Common Stock, any consolidation or merger to which the Corporation is a party, any sale or transfer of all or substantially all of the assets of the Corporation, or any compulsory share exchange whereby the Common Stock is converted into other securities, cash or property or (E) the Corporation shall authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Corporation, then, in each case, the Corporation shall cause to be filed at each office or agency maintained for the purpose of conversion of this Preferred Stock, and shall cause to be delivered by facsimile or email to each Holder at its last facsimile number or email address as it shall appear upon the stock books of the Corporation, at least twenty (20) calendar days prior to the applicable record or effective date hereinafter specified, a notice stating (x) the date on which a record is to be taken for the purpose of such dividend, distribution, redemption, rights or warrants, or if a record is not to be taken, the date as of which the holders of the Common Stock of record to be entitled to such dividend, distributions, redemption, rights or warrants are to be determined or (y) the date on which such reclassification, consolidation, merger, sale, transfer or share exchange is expected to become effective or close, and the date as of which it is expected that holders of the Common Stock of record shall be entitled to exchange their shares of the Common Stock for securities, cash or other property deliverable upon such reclassification, consolidation, merger, sale, transfer or share exchange, provided that the failure to deliver such notice or any defect therein or in the delivery thereof shall not affect the validity of the corporate action required to be specified in such notice. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Corporation or any of the Subsidiaries, the Corporation shall simultaneously file such notice with the Commission pursuant to a Current Report on Form 8-K. The Holder shall remain entitled to convert the Conversion Amount of this Preferred Stock (or any part hereof) during the 20-day period commencing on the date of such notice through the effective date of the event triggering such notice except as may otherwise be expressly set forth herein.

Section 8. Miscellaneous.

a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder including, without limitation, any Notice of Conversion, shall be in writing and delivered personally, by facsimile or e-mail, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at 19 Presidential Way, Woburn, Massachusetts 01801, Attention: Chief Executive Officer, facsimile number 781-933-3279, e-mail address peoples@yield10bio.com, or such other facsimile number, e-mail address or address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 8. Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by facsimile, or by e-mail, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number, e-mail address or address of such Holder appearing on the books of the Corporation. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest

of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or e-mail at the e-mail address set forth in this Section 8 prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number or e-mail at the e-mail address set forth in this Section on a day that is not a Trading Day or later than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

b) Absolute Obligation. Except as expressly provided herein, no provision of this Certificate of Designation shall alter or impair the obligation of the Corporation, which is absolute and unconditional, to pay liquidated damages, and accrued dividends, as applicable, on the shares of Preferred Stock at the time, place, and rate, and in the coin or currency, herein prescribed.

c) Lost or Mutilated Preferred Stock Certificate. If a Holder's Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership thereof reasonably satisfactory to the Corporation.

d) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. All legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by this Certificate of Designation (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts sitting in the City of New York, Borough of Manhattan (the "New York Courts"). The Corporation and each Holder hereby irrevocably submit to the exclusive jurisdiction of the New York Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waive, and agree not to assert in any suit, action or proceeding, any claim that they are not personally subject to the jurisdiction of such New York Courts, or such New York Courts are improper or inconvenient venue for such proceeding. The Corporation and each Holder hereby irrevocably waive personal service of process and consent to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agree that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. The Corporation and each Holder hereto hereby irrevocably

waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If the Corporation or any Holder shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

e) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

f) Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances. If it shall be found that any interest or other amount deemed interest due hereunder violates the applicable law governing usury, the applicable rate of interest due hereunder shall automatically be lowered to equal the maximum rate of interest permitted under applicable law.

g) Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

h) Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

i) Status of Converted or Redeemed Preferred Stock. If any shares of Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of preferred stock and shall no longer be designated as Series A Convertible Preferred Stock.

****

RESOLVED, FURTHER, that the Chairman, the president or any vice-president, and the secretary or any assistant secretary, of the Corporation be and they hereby are authorized and directed to prepare and file this Certificate of Designation of Preferences, Rights and Limitations in accordance with the foregoing resolution and the provisions of Delaware law.

IN WITNESS WHEREOF, the undersigned have executed this Certificate this 19th day of December, 2017.

/s/ Oliver P. Peoples	/s/ Charles B. Haaser
Nam: Oliver P. Peoples	Name: Charles B. Haaser
Title: President and Chief Executive Officer	Title: Vice President - Finance, Chief Accounting Officer, Treasurer and Assistant Secretary

ANNEX A

NOTICE OF CONVERSION

(TO BE EXECUTED BY THE REGISTERED HOLDER IN ORDER TO CONVERT SHARES OF PREFERRED STOCK)

The undersigned hereby elects to convert the number of shares of Series A Convertible Preferred Stock indicated below into shares of common stock, par value $0.01 per share (the "Common Stock"), of Yield10 Bioscience, Inc., a Delaware corporation (the "Corporation"), according to the conditions hereof, as of the date written below. If shares of Common Stock are to be issued in the name of a Person other than the undersigned, the undersigned will pay all transfer taxes payable with respect thereto. No fee will be charged to the Holders for any conversion, except for any such transfer taxes.

Conversion calculations:

Date to Effect Conversion: _____

Number of shares of Preferred Stock owned prior to Conversion: _____

Number of shares of Preferred Stock to be Converted: _____

Stated Value of shares of Preferred Stock to be Converted: _____

Number of shares of Common Stock to be Issued: _____

Applicable Conversion Price:_____

Number of shares of Preferred Stock subsequent to Conversion: _____

Address for Delivery: _____
or
DWAC Instructions:
Broker no: _____
Account no: _____

[HOLDER

By:_____
Name:
Title:

CERTIFICATE OF AMENDMENT

OF

RESTATED CERTIFICATE OF INCORPORATION

OF

YIELD10 BIOSCIENCE, INC.

Pursuant to Section 242 of the

General Corporation Law of the State of Delaware

YIELD10 BIOSCIENCE, Inc., a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware, does hereby certify as follows:

1. The name of the corporation (hereinafter called the **"Corporation")** is Yield10 Bioscience, Inc.

2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 1, 1998. A Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on November 15, 2006 and thereafter Certificates of Designation were filed on July 8, 2009 and August 22, 2014 with the Secretary of State of the State of Delaware and Certificates of Amendment were filed on October 30, 2014 and May 26, 2015 with the Secretary of State of the State of Delaware and a Certificate of Designation was filed on September 11, 2015 with the Secretary of State of the State of Delaware, and a Certificate of Amendment was filed on January 6, 2017 with the Secretary of State of the State of Delaware.

3. The first paragraph of Article IV of the Corporation's Restated Certificate of Incorporation, as amended, is hereby deleted and replaced in its entirety with:

> "The total number of shares of capital stock which the Corporation shall have authority to issue is two hundred fifty-five million (255,000,000) shares, of which (i) two hundred fifty million (250,000,000) shares shall be a class designated as common stock, par value $.01 per share (the "Common Stock"), and (ii) five million (5,000,000) shares shall be a class designated as undesignated preferred stock, par value $.01 per share (the "Undesignated Preferred Stock").

Upon the effectiveness of this Certificate of Amendment to the Restated Certificate of Incorporation, as amended, every ten (10) issued and outstanding shares of Common Stock of the Corporation shall be changed, combined and reclassified into one (1) whole share of Common Stock, which shares shall be fully paid and nonassessable shares of Common Stock of the Corporation; provided, however, that in lieu of issuing fractional interests in shares of Common Stock to which any stockholder would otherwise be entitled pursuant hereto (after aggregating all

fractions of a share to which such stockholder would otherwise be entitled), the Corporation shall take such actions as permitted by and in accordance with Section 155 of the DGCL.

4. The Board of Directors of the Corporation has duly adopted resolutions (i) authorizing the Corporation to execute and file with the Secretary of State of the State of Delaware this Certificate of Amendment to combine every ten (10) shares of the Corporation's Common Stock, issued and outstanding or held in the treasury of the Corporation into one (1) share of Common Stock, and (ii) declaring this Certificate of Amendment to be advisable and recommended for approval by the stockholders of the Corporation.

5. This Certificate of Amendment was duly adopted in accordance with the provisions of Section 242 of the DGCL by the Board of Directors and stockholders of the Corporation.

6. This Certificate of Amendment as filed under Section 242 of the General Corporation Law of the State of Delaware, has been duly authorized in accordance thereof.

7. This Certificate of Amendment shall take effect on May 26, 2017.

[Remainder of this page intentionally left blank.]

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to Certificate of Incorporation to be signed by its duly authorized President and Chief Executive Officer this 25th day of May, 2017.

YIELD10 BIOSCIENCE, INC.

By: /s/ OLIVER P. PEOPLES

Name: Oliver P. Peoples, Ph,D.

Title: President and Chief Executive Officer

CERTIFICATE OF AMENDMENT

OF

RESTATED CERTIFICATE OF INCORPORATION

OF

METABOLIX, INC.

Pursuant to Section 242 of the
General Corporation Law of the State of Delaware

METABOLIX, Inc., a corporation organized and existing under and by virtue of the General Corporation Law of the State of Delaware (the *"**Corporation**")*, does hereby certify as follows:

1. The name of the corporation (hereinafter called the "Corporation") is Metabolix, Inc.

2. The Certificate of Incorporation of the Corporation was filed with the Secretary of State of the State of Delaware on September 1, 1998. A Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on November 15, 2006 and thereafter Certificates of Designation were filed on July 8, 2009 and August 22, 2014 with the Secretary of State of the State of Delaware and Certificates of Amendment were filed on October 30, 2014 and May 26, 2015 with the Secretary of State of the State of Delaware and a Certificate of Designation was filed on September 11, 2015 with the Secretary of State of the State of Delaware.

3. The Restated Certificate of Incorporation, filed on November 15, 2006, as amended, is hereby further amended to change the name of the Corporation to Yield10 Bioscience, Inc., by striking out Article I thereof and by substituting in lieu of said Article the following new Article I:

The name of the corporation (hereinafter called the "Corporation") is

YIELD10 BIOSCIENCE, INC.

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

[*Signature Page Follows*]

Signed this 6th day of January, 2017.

METABOLIX, INC.

By: /s/ OLIVER P. PEOPLES

Name: Oliver P. Peoples, Ph,D.

Title: President and Chief Executive Officer

CERTIFICATE OF ELIMINATION OF THE

SERIES B PREFERRED STOCK OF

METABOLIX, INC.

Pursuant to Section 151(g)

of the General Corporation Law

of the State of Delaware

Metabolix, Inc., a Delaware corporation (the "**Corporation**"), in accordance with the provisions of Section 151(g) of the General Corporation Law of the State of Delaware, hereby certifies as follows:

1. That, pursuant to Section 151 of the General Corporation Law of the State of Delaware and authority granted in the Amended and Restated Certificate of Incorporation of the Corporation, as theretofore amended (the "**Certificate of Incorporation**"), the Board of Directors of the Corporation, by resolution duly adopted, authorized the issuance of a series of 50,000 shares of Series B Preferred Stock, par value $.01 per share, of the Corporation (the "**Series B Preferred Stock**"), and established the voting powers, designations, preferences and relative, participating, optional or other rights, if any, or the qualifications, limitations or restrictions thereof, and, on August 22, 2014, filed a Certificate of Designation (the "**Certificate of Designation**") with respect to such Series B Preferred Stock in the office of the Secretary of State of the State of Delaware (the "**Secretary of State**").

2. That no shares of said Series B Preferred Stock are outstanding and no shares thereof will be issued subject to said Certificate of Designation.

3. That the Board of Directors of the Corporation has adopted the following resolutions:

RESOLVED: That no shares of the Corporation's authorized Series B Preferred Stock, par value $0.01 per share (the "**Series B Preferred Stoc**k") are outstanding and that no shares of the Series B Preferred Stock will be issued subject to the certificate of designation previously filed on August 22, 2014 with respect to the Series B Preferred Stock.

RESOLVED: That the proper officers of the Corporation (the "**Authorized Officers**") be and hereby are authorized and directed to file a certificate setting forth this resolution with the Secretary of State of the State of Delaware pursuant to the provisions of Section 151(g) of the General Corporation Law of the State of Delaware for the purpose of eliminating from the Corporation's certificate of incorporation all matters set forth in the Certificate of Designation with respect to the Series B Preferred Stock; and further that upon such filing all authorized shares of Series B Preferred Stock shall be eliminated and restored to the status of authorized but unissued shares of undesignated preferred stock under the Corporation's certificate of incorporation.

4. That, accordingly, all matters set forth in the Certificate of Designation with respect to the Series B Preferred Stock be, and hereby are, eliminated from the Certificate of Incorporation, as heretofore amended, of the Corporation.

[Remainder of page intentionally left blank]

IN WITNESS WHEREOF, the undersigned authorized officer of the Corporation, has executed this Certificate of Elimination as of September 11, 2015.

METABOLIX, INC.

By: /s/ Joseph Shaulson

Name: Joseph Shaulson

Title: President & CEO

CERTIFICATE OF AMENDMENT TO
AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
METABOLIX, INC.

Metabolix, Inc. (the **"Corporation"),** a corporation organized under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the **"General Corporation Law"),**

DOES HEREBY CERTIFY:

1. Pursuant to Section 242 of the General Corporation Law, this Certificate of Amendment to Amended and Restated Certificate of Incorporation (this "**Amendment")** amends the provisions of the Amended and Restated Certificate of Incorporation of the Corporation (the "**Certificate**").

2. This Amendment has been approved and duly adopted by the Corporation's Board of Directors and its stockholders in accordance with the provisions of Section 242 of the General Corporation Law, and the provisions of the Certificate.

3. The following language is hereby added to the end of the first paragraph of ARTICLE IV of the Certificate:

"Effective at 5:00 p.m. EDT, on May 26, 2015, every six outstanding shares of Common Stock will be combined into and automatically become one share of outstanding Common Stock of the Corporation. The Corporation will not issue fractional shares on account of the foregoing reverse stock split; all shares that are held by a stockholder as of the effective date hereof shall be aggregated and each fractional share resulting from the reverse stock split after giving effect to such aggregation shall be cancelled.

In lieu of any interest in a fractional share to which a stockholder would otherwise be entitled as a result of such reverse stock split, such stockholder will be paid a cash amount for such fractional shares equal to the product obtained by multiplying (a) the closing price of the shares of Common Stock on the first trading day immediately preceding the effective date of the reverse split, as reported on The NASDAQ Capital Market by (b) the number of shares of Common Stock held by such stockholder that would otherwise have been exchanged for such fractional share interest. The par value of the Common Stock and the total number of authorized shares of Common Stock will not change as a result of such reverse stock split."

[End of Text]

IN WITNESS WHEREOF, the undersigned authorized officer of the Corporation, has executed this Certificate of Amendment to Amended and Restated Certificate of Incorporation as of May 26, 2015.

METABOLIX, INC.

By: /s/ Joseph Shaulson

Name: Joseph Shaulson

Title: President & CEO

CERTIFICATE OF AMENDMENT TO
AMENDED AND RESTATED CERTIFICATE OF INCORPORATION
OF
METABOLIX, INC.

Metabolix, Inc. (the **"Corporation"),** a corporation organized under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the **"General Corporation Law"),**

DOES HEREBY CERTIFY:

1. Pursuant to Section 242 of the General Corporation Law, this Certificate of Amendment to Amended and Restated Certificate of Incorporation (this **"Amendment")** amends the provisions of the Amended and Restated Certificate of Incorporation of the Corporation (the **"Certificate").**

2. This Amendment has been approved and duly adopted by the Corporation's Board of Directors and its stockholders in accordance with the provisions of Section 242 of the General Corporation Law, and the provisions of the Certificate.

3. The first paragraph of ARTICLE IV of the Certificate is hereby amended and restated in its entirety to read as set forth below:

"The total number of shares of capital stock which the Corporation shall have authority to issue is Two Hundred Fifty Five Million (255,000,000) shares, of which (i) Two Hundred Fifty Million (250,000,000) shares shall be a class designated as common stock, par value $.01 per share (the **"Common Stock"),** (ii) Four Million Nine Hundred Fifty Thousand (4,950,000) shares shall be a class designated as undesignated preferred stock, par value $.01 per share (the **"Undesignated Preferred Stock")** and (iii) Fifty Thousand (50,000) shares shall be a class designated as Series B Convertible Preferred Stock, par value $.O1 per share (the **"Series B Preferred Stock")."**

[End of Text]

IN WITNESS WHEREOF, the undersigned authorized officer of the Corporation, has executed this Certificate of Amendment to Amended and Restated Certificate of Incorporation as of October 30, 2014.

METABOLIX, INC.

By: /s/ Joseph Shaulson

Name: Joseph Shaulson

Title: President & CEO

METABOLIX, INC.

**CERTIFICATE OF DESIGNATION OF PREFERENCES,
RIGHTS AND LIMITATIONS
OF
SERIES B CONVERTIBLE PREFERRED STOCK**

PURSUANT TO SECTION 151 OF THE
DELAWARE GENERAL CORPORATION LAW

The undersigned, Joseph Shaulson and Sarah P. Cecil, do hereby certify that:

1. They are the President and Secretary, respectively, of Metabolix, Inc., a Delaware corporation (the "Corporation").

2. The Corporation is authorized to issue Five Million shares of preferred stock, $0.01 par value, none of which have been issued.

3. The following resolutions were duly adopted by the board of directors of the Corporation (the "Board of Directors"):

WHEREAS, the certificate of incorporation of the Corporation provides for a class of its authorized stock known as preferred stock, consisting of Five Million shares, $0.01 par value per share, issuable from time to time in one or more series;

WHEREAS, the Board of Directors is authorized to fix the dividend rights, dividend rate, voting rights, conversion rights, rights and terms of redemption and liquidation preferences of any wholly unissued series of preferred stock and the number of shares constituting any series and the designation thereof, of any of them; and

WHEREAS, it is the desire of the Board of Directors, pursuant to its authority as aforesaid, to fix the rights, preferences, restrictions and other matters relating to a series of the preferred stock, which shall consist of up to 50,000 shares of the preferred stock which the Corporation has the authority to issue, as follows:

NOW, THEREFORE, BE IT RESOLVED, that the Board of Directors does hereby provide for the issuance of a series of preferred stock for cash or exchange of other securities, rights or property and does hereby fix and determine the rights, preferences, restrictions and other matters relating to such series of preferred stock as follows:

TERMS OF PREFERRED STOCK

Section 1. Definitions. For the purposes hereof, the following terms shall have the following meanings:

"Affiliate" means any Person that, directly or indirectly through one or more intermediaries, controls or is controlled by or is under common control with a Person, as such terms are used in and construed under Rule 405 of the Securities Act.

"Alternate Consideration" shall have the meaning set forth in Section 7(d).

"Business Day" means any day except any Saturday, any Sunday, any day which is a federal legal holiday in the United States or any day on which banking institutions in the State of New York are authorized or required by law or other governmental action to close.

"Charter Amendment" means the amendment of the Corporation's Amended and Restated Certificate of Incorporation, as amended, to increase the authorized number of shares of Common Stock to not less than 150,000,000.

"Commission" means the United States Securities and Exchange Commission.

"Common Stock" means the Corporation's common stock, par value $0.01 per share, and stock of any other class of securities into which such securities may hereafter be reclassified or changed.

"Common Stock Equivalents" means any securities of the Corporation which would entitle the holder thereof to acquire at any time Common Stock, including, without limitation, any debt, preferred stock, rights, options, warrants or other instrument that is at any time convertible into or exercisable or exchangeable for, or otherwise entitles the holder thereof to receive, Common Stock.

"Conversion Price" shall have the meaning set forth in Section 6(b).

"Conversion Shares" means, collectively, the shares of Common Stock issuable upon conversion of the shares of Series B Preferred Stock in accordance with the terms hereof.

"Conversion Shares Registration Statement" means a registration statement that registers the resale of all Conversion Shares of the Holders, who shall be named as "selling stockholders" therein and meets the requirements of Section 9 of the Purchase Agreement.

"Delaware Courts" shall have the meaning set forth in Section 8(c).

"Fundamental Transaction" shall have the meaning set forth in Section 7(d).

"Holder" shall have the meaning given such term in Section 2.

"Issue Date Price" shall have the meaning set forth in Section 7(t).

"Liquidation" shall have the meaning set forth in Section 5.

"Person" means an individual or corporation, partnership, trust, incorporated or unincorporated association, joint venture, limited liability company, joint stock company, government (or an agency or subdivision thereof) or other entity of any kind.

"Purchase Agreement" means the Securities Purchase Agreement, dated as of August 4, 2014, among the Corporation and the original Holders, as amended, modified or supplemented from time to time in accordance with its terms.

"Purchase Rights" shall have the meaning set forth in Section 7(b).

"Securities" means the Series B Preferred Stock and the Underlying Shares.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

"Series B Preferred Stock" shall have the meaning set forth in Section 2.

"Stated Value" shall have the meaning set forth in Section 2, as the same may be increased pursuant to Section 3.

"Stockholder Approval" means the approval of the Charter Amendment by the requisite stockholders of the Corporation.

"Successor Entity" shall have the meaning set forth in Section 7(d).

"Trading Day" means a day on which the principal Trading Market is open for business.

"Trading Market" means any of the following markets or exchanges on which the Common Stock is listed or quoted for trading on the date in question: the NYSE MKT, the Nasdaq Capital Market, the Nasdaq Global Market, the Nasdaq Global Select Market, or the New York Stock Exchange (or any successors to any of the foregoing).

"Transaction Documents" means this Certificate of Designation, the Purchase Agreement, and all exhibits and schedules hereto and thereto.

"Transfer Agent" means American Stock Transfer and Trust Company, the current transfer agent of the Corporation, and any successor transfer agent of the Corporation.

"Underlying Shares" means the shares of Common Stock issued and issuable upon conversion of the Series B Preferred Stock.

Section 2. Designation, Amount and Par Value. The series of preferred stock shall be designated as its Series B Convertible Preferred Stock (the "Series 13 Preferred Stock") and the number of shares so designated shall be up to 50,000 (which shall not be subject to increase without the written consent of all of the holders of the Series B Preferred Stock (each, a "Holder" and collectively, the "Holders")). Each share of Series B Preferred Stock shall have a par value of $.01 per share and a stated value equal to $1,000 (the "Stated Value").

Section 3. Dividends. Except for stock dividends or distributions for which adjustments are to be made pursuant to Section 7, Holders shall be entitled to receive, and the Corporation shall pay, dividends or distributions on shares of Series B Preferred Stock equal (on an as-if-converted-to-Common Stock basis) to and in the same form as dividends or distributions actually paid on shares of the Common Stock when, as and if such dividends or distributions are paid on shares of the Common Stock. No other dividends or distributions shall be paid on shares of Series B Preferred Stock.

Section 4. Voting Rights. Except as otherwise provided herein or as otherwise required by law, the Series B Preferred Stock shall have no voting rights. However, as long as any shares of Series B Preferred Stock are outstanding, the Corporation shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Series B Preferred Stock, alter or change adversely the powers, preferences or rights given to the Series B Preferred Stock or alter or amend this Certificate of Designation in a manner that adversely affects the powers, preferences or rights given to the Series B Preferred Stock.

Section 5. Liquidation. Upon any liquidation, dissolution or winding-up of the Corporation, whether voluntary or involuntary (a "Liquidation"), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Corporation an amount equal (on an as-if-converted-to-Common Stock basis) to and in the same form as amounts actually paid on shares of the Common Stock. The Corporation shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Section 6. Conversion.

a) Mandatory, Automatic Conversion. Upon the filing and acceptance of the Charter Amendment with the Secretary of State of the State of Delaware, each share of Series B Preferred Stock shall automatically convert into that number of shares of Common Stock determined by dividing the Stated Value of such share of Series B Preferred Stock by the Conversion Price. Any conversion pursuant to this Section 6(a) shall occur automatically and without any further action by the Holders and whether or not the certificates representing such shares of Series 13 Preferred Stock are surrendered to the Corporation or its Transfer Agent. Upon the occurrence of such automatic conversion, the Corporation shall provide written notice to the Holders, and the Holders shall, a reasonable time thereafter, surrender the certificates representing such shares at the office

of the Corporation or any Transfer Agent for the Series B Preferred Stock. Thereupon, there shall be issued and delivered to such Holder promptly at such office and in its name as shown on the Corporation's stock records, a certificate or certificates for the number of shares of Common Stock into which the shares of Series B Preferred Stock surrendered were convertible on the date on which such automatic conversion occurred. All Shares of Series B Preferred Stock converted into Common Stock in accordance with the terms hereof shall be deemed to have been retired and canceled and shall not be reissued.

b) Conversion Price. The conversion price for the Series B Preferred Stock (the "Conversion Price") shall equal $1.00, subject to adjustment as provided in Section 7.

c) Fractional Shares. No fractional shares or scrip representing fractional shares shall be issued upon the conversion of the Series B Preferred Stock. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such conversion, the Corporation shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Conversion Price or round up to the next whole share.

d) Transfer Taxes and Expenses. The issuance of certificates for shares of the Common Stock on conversion of Series B Preferred Stock shall be made without charge to any Holder for any documentary stamp or similar taxes that may be payable in respect of the issue or delivery of such certificates; provided that the Corporation shall not be required to pay any tax that may be payable in respect of any transfer involved in the issuance and delivery of any such certificate upon conversion in a name other than that of the Holders of such shares of Series B Preferred Stock and the Corporation shall not be required to issue or deliver such certificates unless or until the Person or Persons requesting the issuance thereof shall have paid to the Corporation the amount of such tax or shall have established to the satisfaction of the Corporation that such tax has been paid.

e) Issuance Limitations. Notwithstanding anything herein to the contrary, the Series B Preferred Stock may not be converted into any shares of Common Stock unless the Corporation has obtained Stockholder Approval.

Section 7. Certain Adjustments.

a) Stock Dividends and Stock Splits. If the Corporation, at any time while

the Series B Preferred Stock is outstanding: (i) pays a stock dividend or otherwise makes a distribution or distributions payable in shares of Common Stock on shares of Common Stock or any other Common Stock Equivalents (which, for avoidance of doubt, shall not include any shares of Common Stock issued by the Corporation upon conversion of, or payment of a dividend on, Series B Preferred Stock), (ii) subdivides outstanding shares of Common Stock into a larger number of shares, (iii) combines (including by way of a reverse stock split) outstanding shares of Common Stock into a smaller number of shares, or (iv) issues, in the event of a reclassification of shares of the Common Stock, any shares of

capital stock of the Corporation, then the Conversion Price shall be multiplied by a fraction of which the numerator shall be the number of shares of Common Stock outstanding immediately before such event, and of which the denominator shall be the number of shares of Common Stock outstanding immediately after such event. Any adjustment made pursuant to this Section 7(a) shall become effective immediately after the record date for the determination of stockholders entitled to receive such dividend or distribution and shall become effective immediately after the effective date in the case of a subdivision, combination or re-classification.

b) Subsequent Rights Offerings. In addition to any adjustments pursuant to Section 7(a), if, at any time while the Series B Preferred Stock is outstanding, the Corporation grants, issues or sells any Common Stock Equivalents or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of shares of Common Stock (the "Purchase Rights"), then each Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which such Holder could have acquired if such Holder had held the number of shares of Common Stock acquirable upon complete conversion of such Holder's Series B Preferred Stock immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issue or sale of such Purchase Rights.

c) Pro Rata Distributions. During such time as Series B Preferred Stock is outstanding, if the Corporation declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property or options by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "Distribution"), at any time after the issuance of the Series B Preferred Stock, then, in each such case, Holders shall be entitled to participate in such Distribution to the same extent that such Holders would have participated therein if such Holders had held the number of shares of Common Stock acquirable upon complete conversion of Series B Preferred Stock immediately before the date of which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution.

d) Fundamental Transaction. If, at any time while Series B Preferred Stock is outstanding, (i) the Corporation, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Corporation with or into another Person, (ii) the Corporation, directly or indirectly, effects any sale, lease, license, assignment, transfer, conveyance or other disposition of all or substantially all of its assets in one or a series of related transactions, (iii) any, direct or indirect, purchase offer, tender offer or exchange offer (whether by the Corporation or another Person) is completed pursuant to which holders of Common Stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding Common Stock, (iv) the Corporation, directly or indirectly, in one or more related

transactions effects any reclassification, reorganization or recapitalization of the Common Stock or any compulsory share exchange pursuant to which the Common Stock is effectively converted into or exchanged for other securities, cash or property, or (v) the Corporation, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another Person whereby such other Person acquires more than 50% of the outstanding shares of Common Stock (not including any shares of Common Stock held by the other Person or other Persons making or party to, or associated or Affiliated with the other Persons making or party to, such stock or share purchase agreement or other business combination) (each a "Fundamental Transaction"), then, upon any subsequent conversion of Series B Preferred Stock, Holders shall have the right to receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (without regard to any limitation in Section 6(e) on the conversion of Series B Preferred Stock), the number of shares of Common Stock of the successor or acquiring corporation or of the Corporation, if it is the surviving corporation, and any additional consideration (the "Alternate Consideration") receivable as a result of such Fundamental Transaction by a holder of the number of shares of Common Stock for which Series B Preferred Stock is convertible immediately prior to such Fundamental Transaction (without regard to any limitation in Section 6(e) on the conversion of Series B Preferred Stock). For purposes of any such conversion, the determination of the Conversion Price shall be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of Common Stock in such Fundamental Transaction, and the Corporation shall apportion the Conversion Price among the Alternate Consideration in a reasonable manner reflecting the relative value of any different components of the Alternate Consideration. If holders of Common Stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, the Holders shall be given the same choice as to the Alternate Consideration as to the securities, cash or property to be received upon any conversion of Series B Preferred Stock following such Fundamental Transaction. To the extent necessary to effectuate the foregoing provisions, any successor to the Corporation or surviving entity in such Fundamental Transaction shall file a new Certificate of Designation with the same terms and conditions and issue to the Holders new preferred stock consistent with the foregoing provisions and evidencing the Holders' right to convert such preferred stock into Alternate Consideration. The Corporation shall cause any successor entity in a Fundamental Transaction in which the Corporation is not the survivor (the "Successor Entity") to assume in writing all of the obligations of the Corporation under this Certificate of Designation and the Purchase Agreement in accordance with the provisions of this Section 7(d) pursuant to written agreements and shall, at the option of a Holders, deliver to the Holders in exchange for Series B Preferred Stock a security of the Successor Entity evidenced by a written instrument substantially similar in form and substance to Series B Preferred Stock which is convertible into a corresponding number of shares of capital stock of such Successor Entity (or its parent entity) equivalent to the shares of Common Stock acquirable and receivable upon conversion of Series B Preferred Stock (without regard to any limitations on the conversion of Series B Preferred Stock) prior to such Fundamental Transaction, and

with a conversion price which applies the Conversion Price to such shares of capital stock (but taking into account the relative value of the shares of Common Stock pursuant to such Fundamental Transaction and the value of such shares of capital stock, such number of shares of capital stock and such conversion price being for the purpose of protecting the economic value of Series B Preferred Stock immediately prior to the consummation of such Fundamental Transaction), and which is reasonably satisfactory in form and substance to the Holders. Upon the occurrence of any such Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of such Fundamental Transaction, the provisions of this Certificate of Designation and the other Transaction Documents referring to the "Corporation" shall refer instead to the Successor Entity), and may exercise every right and power of the Corporation and shall assume all of the obligations of the Corporation under this Certificate of Designation and the other Transaction Documents with the same effect as if such Successor Entity had been named as the Corporation herein.

e) Calculations. All calculations under this Section 7 shall be made to the nearest cent or the nearest 11100th of a share, as the case may be. For purposes of this Section 7, the number of shares of Common Stock deemed to be issued and outstanding as of a given date shall be the number of shares of Common Stock (excluding any treasury shares of the Corporation) issued and outstanding.

f) Notice to the Holders of Adjustment to Conversion Price. Whenever the Conversion Price is adjusted pursuant to any provision of this Section 7, the Corporation shall promptly deliver to each Holder a notice setting forth the Conversion Price after such adjustment and setting forth a brief statement of the facts requiring such adjustment.

Section 8. Miscellaneous.

a) Notices. Any and all notices or other communications or deliveries to be provided by the Holders hereunder shall be in writing and delivered personally, by facsimile, or sent by a nationally recognized overnight courier service, addressed to the Corporation, at the address set forth above Attention: Secretary, or such other address as the Corporation may specify for such purposes by notice to the Holders delivered in accordance with this Section 8(a). Any and all notices or other communications or deliveries to be provided by the Corporation hereunder shall be in writing and delivered personally, by facsimile, or sent by a nationally recognized overnight courier service addressed to each Holder at the facsimile number or address of such Holder appearing on the books of the Corporation, or if no such facsimile number or address appears on the books of the Corporation, at the facsimile number or address of such Holder, as set forth in Schedule I to the Purchase Agreement. Any notice or other communication or deliveries hereunder shall be deemed given and effective on the earliest of (i) the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number set forth in this Section 8(a) prior to 5:30 p.m. (New York City time) on any date, (ii) the next Trading Day after the date of transmission, if such notice or communication is delivered via facsimile at the facsimile number set forth in this Section 8(a) on a day that is not a Trading Day or later

than 5:30 p.m. (New York City time) on any Trading Day, (iii) the second Trading Day following the date of mailing, if sent by U.S. nationally recognized overnight courier service, or (iv) upon actual receipt by the party to whom such notice is required to be given.

b) Lost or Mutilated Series B Preferred Stock Certificate. If a Holder's Series B Preferred Stock certificate shall be mutilated, lost, stolen or destroyed, the Corporation shall execute and deliver, in exchange and substitution for and upon cancellation of a mutilated certificate, or in lieu of or in substitution for a lost, stolen or destroyed certificate, a new certificate for the shares of Series B Preferred Stock so mutilated, lost, stolen or destroyed, but only upon receipt of evidence of such loss, theft or destruction of such certificate, and of the ownership hereof reasonably satisfactory to the Corporation and, if requested by the Corporation, in its reasonable discretion, the receipt of a bond in a customary amount.

c) Governing Law. All questions concerning the construction, validity, enforcement and interpretation of this Certificate of Designation shall be governed by and construed and enforced in accordance with the internal laws of the State of Delaware, without regard to the principles of conflict of laws thereof. Each party agrees that ail legal proceedings concerning the interpretation, enforcement and defense of the transactions contemplated by any of the Transaction Documents (whether brought against a party hereto or its respective Affiliates, directors, officers, shareholders, employees or agents) shall be commenced in the state and federal courts of the State of Delaware (the "Delaware Courts"). Each party hereto hereby irrevocably submits to the exclusive jurisdiction of the Delaware Courts for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein (including with respect to the enforcement of any of the Transaction Documents), and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of such Delaware Courts, or such Delaware Courts are improper or inconvenient venue for such proceeding. Each party hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof via registered or certified mail or overnight delivery (with evidence of delivery) to such party at the address in effect for notices to it under this Certificate of Designation and agrees that such service shall constitute good and sufficient service of process and notice thereof. Nothing contained herein shall be deemed to limit in any way any right to serve process in any other manner permitted by applicable law. Each party hereto hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Certificate of Designation or the transactions contemplated hereby. If any party shall commence an action or proceeding to enforce any provisions of this Certificate of Designation, then the prevailing party in such action or proceeding shall be reimbursed by the other party for its attorneys' fees and other costs and expenses incurred in the investigation, preparation and prosecution of such action or proceeding.

d) Waiver. Any waiver by the Corporation or a Holder of a breach of any provision of this Certificate of Designation shall not operate as or be construed to be a

waiver of any other breach of such provision or of any breach of any other provision of this Certificate of Designation or a waiver by any other Holders. The failure of the Corporation or a Holder to insist upon strict adherence to any term of this Certificate of Designation on one or more occasions shall not be considered a waiver or deprive that party (or any other Holder) of the right thereafter to insist upon strict adherence to that term or any other term of this Certificate of Designation on any other occasion. Any waiver by the Corporation or a Holder must be in writing.

e) Severability. If any provision of this Certificate of Designation is invalid, illegal or unenforceable, the balance of this Certificate of Designation shall remain in effect, and if any provision is inapplicable to any Person or circumstance, it shall nevertheless remain applicable to all other Persons and circumstances.

f) Next Business Day. Whenever any payment or other obligation hereunder shall be due on a day other than a Business Day, such payment shall be made on the next succeeding Business Day.

g) Headings. The headings contained herein are for convenience only, do not constitute a part of this Certificate of Designation and shall not be deemed to limit or affect any of the provisions hereof.

h) Status of Converted or Redeemed Series B Preferred Stock. Shares of Series B Preferred Stock may only be issued pursuant to the Purchase Agreement. If any shares of Series B Preferred Stock shall be converted, redeemed or reacquired by the Corporation, such shares shall resume the status of authorized but unissued shares of preferred stock and shall no longer be designated as Series B Convertible Preferred Stock.

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RESOLVED, FURTHER, that the Chairman, the president or any vice-president, and the secretary or any assistant secretary, of the Corporation be, and they hereby are, authorized and directed to prepare and file this Certificate of Designation of Preferences, Rights and Limitations in accordance with the foregoing resolution and the provisions of Delaware law.
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IN WITNESS WHEREOF, the undersigned have executed this Certificate this 22nd day of August 2014.

/s/ Joseph Shaulson	/s/ Sarah P. Cecil
Joseph Shaulson	Sarah P. Cecil
President	Secretary

CERTIFICATE OF DESIGNATIONS
OF
SERIES A JUNIOR PARTICIPATING CUMULATIVE
PREFERRED STOCK
OF
METABOLIX, INC.

METABOLIX, INC., a corporation organized and existing under the General Corporation Law of the State of Delaware (the "Corporation"), in accordance with the provisions of Section 103 thereof,

DOES HEREBY CERTIFY:

Pursuant to the authority conferred upon the Board of Directors by the Amended and Restated Certificate of Incorporation (the "Certificate of Incorporation"), and Section 151(g) of the General Corporation Law of the State of Delaware, on July 7, 2009, the Board of Directors adopted the following resolution determining it desirable and in the best interests of the Corporation and its stockholders for the Corporation to create a series of 45,000 shares of preferred stock designated as "Series A Junior Participating Cumulative Preferred Stock":

RESOLVED, that pursuant to the authority vested in the Board of Directors of this Corporation, in accordance with the provisions of the Certificate of Incorporation, a series of preferred stock, par value $0.01 per share, of the Corporation be and hereby is created, and that the designation and number of shares thereof and the voting and other powers, preferences and relative, participating, optional or other rights of the shares of such series and the qualifications, limitations and restrictions thereof are as follows:

Series A Junior Participating Cumulative Preferred Stock

Section 1. Designation and Amount. There shall be a series of preferred stock that shall be designated as "Series A Junior Participating Cumulative Preferred Stock" (the "Series A Preferred Stock"), and the number of shares initially constituting such series shall be 45,000; provided, however, that if more than a total of 45,000 shares of Series A Preferred Stock shall be issuable upon the exercise of Rights (the "Rights") issued pursuant to the Shareholder Rights Agreement dated as of July 7, 2009, between the Corporation and American Stock Transfer & Trust Company, LLC, as Rights Agent (the "Rights Agreement"), the Board of Directors of the Corporation, pursuant to Section 151(g) of the General Corporation Law of the State of Delaware, may direct by resolution or resolutions that a certificate be properly executed, acknowledged, filed and recorded, in accordance with the provisions of Section 103 thereof, providing for the total number of shares of Series A Preferred Stock authorized to be issued to be increased (to the extent that the Certificate of Incorporation then permits) to the largest number of whole shares (rounded up to the nearest whole number) issuable upon exercise of such Rights.

Section 2. Dividends and Distributions.

(A) (i) Subject to the rights of the holders of any shares of any class or series of preferred stock (or any similar stock) ranking prior and superior to the Series A Preferred Stock with respect to dividends, the holders of shares of Series A Preferred Stock, in preference to the holders of shares of common stock and of any other class or series of stock ranking junior to the Series A Preferred Stock, shall be entitled to receive, when, as and if declared by the Board of Directors out of funds legally available for the purpose, quarterly dividends payable in cash on the first day of March, June, September and December in each year (each such date being referred to herein as a "Quarterly Dividend Payment Date"), commencing on the first Quarterly Dividend Payment Date after the first issuance of a share or fraction of a share of Series A Preferred Stock, in an amount per share (rounded to the nearest cent) equal to the greater of (a) $1.00 or (b) subject to the provisions for adjustment hereinafter set forth, 10,000 times the aggregate per share amount of all cash dividends, and 10,000 times the aggregate per share amount (payable in kind) of all non-cash dividends or other distributions other than a dividend payable in shares of common stock or a subdivision of the outstanding shares of common stock (by reclassification or otherwise), declared on the common stock since the immediately preceding Quarterly Dividend Payment Date, or, with respect to the first Quarterly Dividend Payment Date, since the first issuance of any share or fraction of a share of Series A Preferred Stock. The multiple of cash and non-cash dividends declared on the common stock to which holders of the Series A Preferred Stock are entitled, which shall be 10,000 initially but which shall be adjusted from time to time as hereinafter provided, is hereinafter referred to as the "Dividend Multiple." In the event the Corporation shall at any time after July 7, 2009 (the "Rights Declaration Date") (i) declare or pay any dividend on common stock payable in shares of common stock, or (ii) effect a subdivision or combination or consolidation of the outstanding shares of common stock (by reclassification or otherwise than by payment of a dividend in shares of common stock) into a greater or lesser number of shares of common stock, then in each such case the Dividend Multiple thereafter applicable to the determination of the amount of dividends which holders of shares of Series A Preferred Stock shall be entitled to receive shall be the Dividend Multiple applicable immediately prior to such event multiplied by a fraction, the numerator of which is the number of shares of common stock outstanding immediately after such event and the denominator of which is the number of shares of common stock that were outstanding immediately prior to such event.

(ii) Notwithstanding anything else contained in this paragraph (A), the Corporation shall, out of funds legally available for that purpose, declare a dividend or distribution on the Series A Preferred Stock as provided in this paragraph (A) immediately after it declares a dividend or distribution on the common stock (other than a dividend payable in shares of common stock); provided that, in the event no dividend or distribution shall have been declared on the common stock during the period between any Quarterly Dividend Payment Date and the next subsequent Quarterly Dividend Payment Date, a dividend of $1.00 per share on the Series A Preferred Stock shall nevertheless be payable on such subsequent Quarterly Dividend Payment Date.

(B) Dividends shall begin to accrue and be cumulative on outstanding shares of Series A Preferred Stock from the Quarterly Dividend Payment Date next preceding the date of issue of such shares of Series A Preferred Stock, unless the date of issue of such shares is prior to the record date for the first Quarterly Dividend Payment Date, in which case dividends on such shares shall begin to accrue from the date of issue of such shares, or unless the date of issue is a Quarterly Dividend Payment Date or is a date after the record date for the determination of holders of shares of Series A Preferred Stock entitled to receive a quarterly dividend and before such Quarterly Dividend Payment Date, in either of which events such dividends shall begin to accrue and be cumulative from such Quarterly Dividend Payment Date. Accrued but unpaid dividends shall not bear interest. Dividends paid on the shares of Series A Preferred Stock in an amount less than the total amount of such dividends at the time accrued and payable on such shares shall be allocated pro rata on a share-by-share basis among all such shares at the time outstanding. The Board of Directors may fix in accordance with applicable law a record date for the determination of holders of shares of Series A Preferred Stock entitled to receive payment of a dividend or distribution declared thereon, which record date shall be not more than such number of days prior to the date fixed for the payment thereof as may be allowed by applicable law.

Section 3. Voting Rights. In addition to any other voting rights required by law, the holders of shares of Series A Preferred Stock shall have the following voting rights:

(A) Subject to the provision for adjustment hereinafter set forth, each share of Series A Preferred Stock shall entitle the holder thereof to 10,000 votes on all matters submitted to a vote of the stockholders of the Corporation. The number of votes which a holder of a share of Series A Preferred Stock is entitled to cast, which shall initially be 10,000 but which may be adjusted from time to time as hereinafter provided, is hereinafter referred to as the "Vote Multiple." In the event the Corporation shall at any time after the Rights Declaration Date (i) declare or pay any dividend on common stock payable in shares of common stock, or (ii) effect a subdivision or combination or consolidation of the outstanding shares of common stock (by reclassification or otherwise than by payment of a dividend in shares of common stock) into a greater or lesser number of shares of common stock, then in each such case the Vote Multiple thereafter applicable to the determination of the number of votes per share to which holders of shares of Series A Preferred Stock shall be entitled shall be the Vote Multiple immediately prior to such event multiplied by a fraction, the numerator of which is the number of shares of common stock outstanding immediately after such event and the denominator of which is the number of shares of common stock that were outstanding immediately prior to such event.

(B) Except as otherwise provided herein or by law, the holders of shares of Series A Preferred Stock and the holders of shares of common stock and the holders of shares of any other capital stock of this Corporation having general voting rights, shall vote together as one class on all matters submitted to a vote of stockholders of the Corporation.

(C) (i) Whenever, at any time or times, dividends payable on any shares of Series A Preferred Stock shall be in arrears in an amount equal to at least six full quarter dividends (whether or not declared and whether or not consecutive), the holders of record of the

outstanding shares of Series A Preferred Stock shall have the exclusive right, voting separately as a single class, to elect two directors of the Corporation at a special meeting of stockholders of the Corporation or at the Corporation's next annual meeting of stockholders, and at each subsequent annual meeting of stockholders, as provided below.

(ii) Upon the vesting of such right of the holders of shares of Series A Preferred Stock, the maximum authorized number of members of the Board of Directors shall automatically be increased by two and the two vacancies so created shall be filled by vote of the holders of the outstanding shares of Series A Preferred Stock as hereinafter set forth. A special meeting of the stockholders of the Corporation then entitled to vote shall be called by the Chairman and Chief Executive Officer or the Secretary of the Corporation, if requested in writing by the holders of record of not less than 5% of the shares of Series A Preferred Stock then outstanding. At such special meeting, or, if no such special meeting shall have been called, then at the next annual meeting of stockholders of the Corporation, the holders of the shares of Series A Preferred Stock shall elect, voting as above provided, two directors of the Corporation to fill the aforesaid vacancies created by the automatic increase in the number of members of the Board of Directors. At any and all such meetings for such election, the holders of a majority of the outstanding shares of Series A Preferred Stock shall be necessary to constitute a quorum for such election, whether present in person or proxy, and such two directors shall be elected by the vote of at least a majority of the shares of Series A Preferred Stock held by such stockholders present or represented at the meeting, the holders of Series A Preferred Stock being entitled to cast a number of votes per share of Series A Preferred Stock as is specified in paragraph (A) of this Section 3. Each such additional director shall not be a member of Class I, Class II or Class III of the Board of Directors of the Corporation, but shall serve until the next annual meeting of stockholders for the election of directors, or until his successor shall be elected and shall qualify, or until his right to hold such office terminates pursuant to the provisions of this Section 3(C). Any director elected by holders of shares of Series A Preferred Stock pursuant to this Section 3(C) may be removed at any annual or special meeting, by vote of a majority of the stockholders voting as a class who elected such director, with or without cause. In case any vacancy shall occur among the directors elected by the holders of shares of Series A Preferred Stock pursuant to this Section 3(C), such vacancy may be filled by the remaining director so elected, or his successor then in office, and the director so elected to fill such vacancy shall serve until the next meeting of stockholders for the election of directors.

(iii) The right of the holders of shares of Series A Preferred Stock, voting separately as a class, to elect two members of the Board of Directors of the Corporation as aforesaid shall continue until, and only until, such time as all arrears in dividends (whether or not declared) on the Series A Preferred Stock shall have been paid or declared and set apart for payment, at which time such right shall terminate, except as herein or by law expressly provided subject to revesting in the event of each and every subsequent default of the character above-mentioned. Upon any termination of the right of the holders of the Series A Preferred Stock as a class to vote for directors as herein provided, the term of office of all directors then in office elected by the holders of shares of Series A Preferred Stock pursuant to this Section 3(C) shall terminate immediately. Whenever the term of office of the directors elected by the holders of shares of Series A Preferred Stock pursuant to this Section 3(C) shall terminate and the special

voting powers vested in the holders of the Series A Preferred Stock pursuant to this Section 3(C) shall have expired, the maximum number of members of this Board of Directors of the

Corporation shall be such number as may be provided for in the By- laws of the Corporation,

irrespective of any increase made pursuant to the provisions of this Section 3(C). The voting rights granted by this Section 3(C) shall be in addition to any other voting rights granted to the holders of the Series A Preferred Stock in this Section 3.

(D) Except as otherwise required by applicable law or as set forth herein, holders of Series A Preferred Stock shall have no special voting rights and their consent shall not be required (except to the extent they are entitled to vote with holders of common stock as set forth herein) for taking any corporate action.

Section 4. Certain Restrictions.

(A) Whenever dividends or distributions payable on the Series A Preferred Stock as provided in Section 2 are in arrears, thereafter and until all accrued and unpaid dividends and distributions, whether or not declared, on shares of Series A Preferred Stock outstanding shall have been paid in full, the Corporation shall not:

(i) declare or pay dividends on, make any other distributions on, or redeem or purchase or otherwise acquire for consideration any shares of stock ranking junior (either as to dividends or upon liquidation, dissolution or winding up) to the Series A Preferred Stock;

(ii) declare or pay dividends on or make any other distributions on any shares of stock ranking on a parity (either as to dividends or upon liquidation, dissolution or winding up) with the Series A Preferred Stock, except dividends paid ratably on the Series A Preferred Stock and all such parity stock on which dividends are payable or in arrears in proportion to the total amounts to which the holders of all such shares are then entitled;

(iii) except as permitted in subsection 4(A)(iv) below, redeem, purchase or otherwise acquire for consideration shares of any stock ranking on a parity (either as to dividends or upon liquidation, dissolution or winding up) with the Series A Preferred Stock, provided that the Corporation may at any time redeem, purchase or otherwise acquire shares of any such parity stock in exchange for shares of any stock of the Corporation ranking junior (either as to dividends or upon dissolution, liquidation or winding up) to the Series A Preferred Stock; or

(iv) purchase or otherwise acquire for consideration any shares of Series A Preferred Stock, or any shares of any stock ranking on a parity (either as to dividends or upon liquidation, dissolution or winding up) with the Series A Preferred Stock, except in accordance with a purchase offer made in writing or by publication (as determined by the Board of Directors) to all holders of such shares upon such terms as the Board of Directors, after consideration of the respective annual dividend rates and other relative rights and preferences of the respective series and classes, shall determine in good faith will result in fair and equitable treatment among the respective series or classes.

(B) The Corporation shall not permit any subsidiary of the Corporation to purchase or

otherwise acquire for consideration any shares of stock of the Corporation unless the Corporation could, under subsection (A) of this Section 4, purchase or otherwise acquire such shares at such time and in such manner.

Section 5. Reacquired Shares. Any shares of Series A Preferred Stock purchased or otherwise acquired by the Corporation in any manner whatsoever shall be retired promptly after the acquisition thereof. All such shares shall upon their retirement become authorized but unissued shares of preferred stock and may be reissued as part of a new series of preferred stock to be created by resolution or resolutions of the Board of Directors, subject to the conditions and restrictions on issuance set forth herein.

Section 6. Liquidation, Dissolution or Winding Up. Upon any liquidation, dissolution or winding up of the Corporation (voluntary or otherwise), no distribution shall be made (x) to the holders of shares of stock ranking junior (either as to dividends or upon liquidation, dissolution or winding up) to the Series A Preferred Stock unless, prior thereto, the holders of shares of Series A Preferred Stock shall have received an amount (the "Series A Liquidation Preference") equal to accrued and unpaid dividends and distributions thereon, whether or not declared, to the date of such payment, plus an amount equal to the greater of (1) $10,000.00 per share or (2) an aggregate amount per share, subject to the provision for adjustment hereinafter set forth, equal to 10,000 times the aggregate amount of all cash or other property to be distributed per share to holders of common stock upon such liquidation, dissolution or winding up of the Corporation, or (y) to the holders of stock ranking on a parity (either as to dividends or upon liquidation, dissolution or winding up) with the Series A Preferred Stock, except distributions made ratably on the Series A Preferred Stock and all other such parity stock in proportion to the total amounts to which the holders of all such shares are entitled upon such liquidation, dissolution or winding up. In the event the Corporation shall at any time after the Rights Declaration Date (i) declare or pay any dividend on common stock payable in shares of common stock, or (ii) effect a subdivision or combination or consolidation of the outstanding shares of common stock (by reclassification or otherwise than by payment of a dividend in shares of common stock) into a greater or lesser number of shares of common stock, then in each such case the aggregate amount per share to which holders of shares of Series A Preferred Stock were entitled immediately prior to such event under clause (x) of the preceding sentence shall be adjusted by multiplying such amount by a fraction, the numerator of which is the number of shares of common stock outstanding immediately after such event and the denominator of which is the number of shares of common stock that were outstanding immediately prior to such event.

In the event, however, that there are not sufficient assets available to permit payment in full of the Series A Liquidation Preference and the liquidation preferences of all other classes and series of stock of the Corporation, if any, that rank on a parity with the Series A Preferred Stock in respect thereof, then the assets available for such distribution shall be distributed ratably to the holders of the Series A Preferred Stock and the holders of such parity shares in proportion to their respective liquidation preferences.

Neither the consolidation of nor merging of the Corporation with or into any other corporation or corporations, nor the sale or other transfer of all or substantially all of the assets of the Corporation, shall be deemed to be a liquidation, dissolution or winding up of the
Corporation within the meaning of this Section 6.

Section 7. Consolidation, Merger, etc. In case the Corporation shall enter into any consolidation, merger, combination or other transaction in which the outstanding shares of common stock are exchanged for or changed into other stock or securities, cash and/or any other property, then in any such case each share of Series A Preferred Stock shall at the same time be similarly exchanged or changed in an amount per share (subject to the provision for adjustment hereinafter set forth) equal to 10,000 times the aggregate amount of stock, securities, cash and/or any other property (payable in kind), as the case may be, into which or for which each share of common stock is changed or exchanged, plus accrued and unpaid dividends, if any, payable with respect to the Series A Preferred Stock. In the event the Corporation shall at any time after the Rights Declaration Date (i) declare or pay any dividend on common stock payable in shares of common stock, or (ii) effect a subdivision or combination or consolidation of the outstanding shares of common stock (by reclassification or otherwise than by payment of a dividend in shares of common stock) into a greater or lesser number of shares of common stock, then in each such case the amount set forth in the preceding sentence with respect to the exchange or change of shares of Series A Preferred Stock shall be adjusted by multiplying such amount by a fraction, the numerator of which is the number of shares of common stock outstanding immediately after such event and the denominator of which is the number of shares of common stock that were outstanding immediately prior to such event.

Section 8. Redemption. The shares of Series A Preferred Stock shall not be redeemable; provided, however, that the foregoing shall not limit the ability of the Corporation to purchase or otherwise deal in such shares to the extent otherwise permitted hereby and by law.

Section 9. Ranking. Unless otherwise expressly provided in the Certificate of Incorporation or a Certificate of Designations relating to any other series of preferred stock of the Corporation, the Series A Preferred Stock shall rank junior to every other series of the Corporation's preferred stock previously or hereafter authorized, as to the payment of dividends and the distribution of assets on liquidation, dissolution or winding up and shall rank senior to the common stock.

Section 10. Fractional Shares. Series A Preferred Stock may be issued in whole shares or in any fraction of a share that is one ten-thousandth (1/10,000th) of a share or any integral multiple of such fraction, which shall entitle the holder, in proportion to such holder's fractional shares, to exercise voting rights, receive dividends, participate in distributions and to have the benefit of all other rights of holders of Series A Preferred Stock. In lieu of fractional shares, the Corporation may elect to make a cash payment as provided in the Rights Agreement for fractions of a share other than one ten-thousandth (1/10,000th) of a share or any integral multiple thereof.

Section 11. Amendment. At any time any shares of Series A Preferred Stock are outstanding, the Certificate of Incorporation and the foregoing Sections 1 through 10, inclusive,

and this Section 11 of the Certificate of Designations shall not be amended in any manner, including by merger, consolidation or otherwise, which would materially alter or change the powers, preferences or special rights of the Series A Preferred Stock so as to affect them adversely without the affirmative vote of the holders of two-thirds or more of the outstanding shares of Series A Preferred Stock, voting separately as a class.

IN WITNESS WHEREOF, the Corporation has caused this Certificate to be signed this 8th day of July, 2009.

METABOLIX, INC.

By: /s/ Richard P. Eno
Name: Richard P. Eno
Title: President and CEO

[Signature Page to Certificate of Designations of
Series A Junior Participating Cumulative Preferred Stock]

AMENDED AND RESTATED

CERTIFICATE OF INCORPORATION

OF

METABOLIX, INC.

Metabolix, Inc., a corporation organized and existing under the laws of the State of Delaware (the "Corporation"), hereby certifies as follows:

1. The name of the Corporation is Metabolix, Inc. The original certificate of incorporation of Metabolix, Inc. was filed with the Secretary of State of the State of Delaware on September 1, 1998.

2. This Amended and Restated Certificate of Incorporation was duly adopted in accordance with the provisions of Sections 242 and 245 of the Delaware General Corporation Law (the "DGCL").

3. The text of the Certificate of Incorporation of this corporation be hereby amended and restated in its entirety to provide as herein set forth in full.

ARTICLE I

The name of the Corporation is Metabolix, Inc.

ARTICLE II

The address of the Corporation's registered office in the State of Delaware is do The Corporation Trust Company, 1209 Orange Street in the City of Wilmington, County of New Castle. The name of its registered agent at such address is The Corporation Trust Company.

ARTICLE III

The purpose of the Corporation is to engage in any lawful act or activity for which corporations may be organized under the DGCL.

ARTICLE IV

CAPITAL STOCK

The total number of shares of capital stock which the Corporation shall have authority to issue is One Hundred Five Million (105,000,000) shares, of which (i) One Hundred Million (100,000,00) shares shall be a class designated as common stock, par value $.01 per share (the "Common Stock"), and (ii) Five Million (5,000,000) shares shall be a class designated as undesignated preferred stock, par value $.01 per share (the "Undesignated Preferred Stock").

The number of authorized shares of the class of Undesignated Preferred Stock may from time to time be increased or decreased (but not below the number of shares outstanding) by the affirmative vote of the holders of a majority of the outstanding shares of Common Stock entitled to vote, without a vote of the holders of the Undesignated Preferred Stock (except as otherwise provided in any certificate of designations of any series of Undesignated Preferred Stock).

The powers, preferences and rights of, and the qualifications, limitations and restrictions upon, each class or series of stock shall be determined in accordance with, or as set forth below in, this Article IV.

A. COMMON STOCK

Subject to all the rights, powers and preferences of the Undesignated Preferred Stock and except as provided by law or in this Article IV (or in any certificate of designations of any series of Undesignated Preferred Stock):

(a) the holders of the Common Stock shall have the exclusive right to vote for the election of directors of the Corporation (the "Directors") and on all other matters requiring stockholder action, each outstanding share entitling the holder thereof to one vote on each matter properly submitted to the stockholders of the Corporation for their vote; provided, however, that, except as otherwise required by law, holders of Common Stock, as such, shall not be entitled to vote on any amendment to this Certificate (or on any amendment to a certificate of designations of any series of Undesignated Preferred Stock) that alters or changes the powers, preferences, rights or other terms of one or more outstanding series of Undesignated Preferred Stock if the holders of such affected series are entitled to vote, either separately or together with the holders of one or more other such series, on such amendment pursuant to this Certificate (or pursuant to a certificate of designations of any series of Undesignated Preferred Stock) or pursuant to the DGCL;

(b) dividends may be declared and paid or set apart for payment upon the Common Stock out of any assets or funds of the Corporation legally available for the payment of dividends, but only when and as declared by the Board or any authorized committee thereof; and

(c) upon the voluntary or involuntary liquidation, dissolution or winding up of the Corporation, the net assets of the Corporation shall be distributed pro rata to the holders of the Common Stock.

B. UNDESIGNATED PREFERRED STOCK

The Board of Directors or any authorized committee thereof is expressly authorized, to the fullest extent permitted by law, to provide for the issuance of the shares of Undesignated Preferred Stock in one or more series of such stock, and by filing a certificate pursuant to applicable law of the State of Delaware, to establish or change from time to time the number of shares of each such series, and to fix the designations, powers, including voting

powers, full or limited, or no voting powers, preferences and the relative, participating, optional or other special rights of the shares of each series and any qualifications, limitations and restrictions thereof

ARTICLE V

STOCKHOLDER ACTION

1. Action without Meeting. Except as otherwise provided herein, any action required or permitted to be taken by the stockholders of the Corporation at any annual or special meeting of stockholders of the Corporation must be effected at a duly called annual or special meeting of stockholders and may not be taken or effected by a written consent of stockholders in lieu thereof.

2. 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.

ARTICLE VI
DIRECTORS

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

2. Election of Directors. Election of Directors need not be by written ballot unless the By-laws of the Corporation (the “By-laws”) shall so provide.

3. Number of Directors; Term of Office. 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, other than those who may be elected by the holders of any series of Undesignated Preferred Stock, shall be classified, with respect to the term for which they severally hold office, into three classes, as nearly equal in number as reasonably possible. The initial Class 1 Directors of the Corporation shall be Edward M. Muller, Matthew Strobeck, Ph.D., and Robert L. Van Nostrand; the initial Class II Directors of the Corporation shall be Jack W. Lasersohn, Jay Kouba, Ph.D., and Oliver P. Peoples, Ph.D.; and the initial Class Ill Directors of the Corporation shall be Edward M. Giles, Anthony J. Sinskey, Sc.D., and James J. Barber, Ph.D. The initial Class I Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 2007, the initial Class II Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 2008, and the initial Class III Directors shall serve for a term expiring at the annual meeting of stockholders to be held in 2009. At each annual meeting of stockholders, Directors elected to succeed those Directors whose terms expire shall be elected for a term of office to expire at the third succeeding annual

meeting of stockholders after their election. Notwithstanding the foregoing, the Directors elected to each class shall hold office until their successors are duly elected and qualified or until their earlier resignation or removal.

Notwithstanding the foregoing, whenever, pursuant to the provisions of Article IV of this Certificate, the holders of any one or more series of Undesignated Preferred Stock shall have the right, voting separately as a series or together with holders of other such series, to elect Directors at an annual or special meeting of stockholders, the election, term of office, filling of vacancies and other features of such directorships shall be governed by the terms of this Certificate and any certificate of designations applicable thereto.

4. Vacancies. Subject to the rights, if any, of the holders of any series of

Undesignated Preferred Stock to elect Directors and to fill vacancies in the Board of Directors relating thereto, any and all vacancies in the Board of Directors, however occurring, including, without limitation, by reason of an increase in size of the Board of Directors, or the death, resignation, disqualification or removal of a Director, shall be filled solely and exclusively by the affirmative vote of a majority of the remaining Directors then in office, even if less than a quorum of the Board of Directors, and not by the stockholders. Any Director appointed in accordance with the preceding sentence shall hold office for the remainder of the full term of the class of Directors in which the new directorship was created or the vacancy occurred and until such Director's successor shall have been duly elected and qualified or until his or her earlier resignation or removal. Subject to the rights, if any, of the holders of any series of Undesignated Preferred Stock to elect Directors, when the number of Directors is increased or decreased, the Board of Directors shall, subject to Article VI.3 hereof, determine the class or classes to which the increased or decreased number of Directors shall be apportioned; provided, however, that no decrease in the number of Directors shall shorten the term of any incumbent Director. In the event of a vacancy in the Board of Directors, the remaining Directors, except as otherwise provided by law, shall exercise the powers of the full Board of Directors until the vacancy is filled.

5. Removal. Subject to the rights, if any, of any series of Undesignated Preferred

Stock to elect Directors and to remove any Director whom the holders of any such stock have the right to elect, any Director (including persons elected by Directors to fill vacancies in the Board of Directors) may be removed from office (i) only with cause and (ii) only by the affirmative vote of the holders of 75% or more of the shares then entitled to vote at an election of Directors. At least forty-five (45) days prior to any meeting of stockholders at which it is proposed that any Director be removed from office, written notice of such proposed removal and the alleged grounds thereof shall be sent to the Director whose removal will be considered at the meeting.

ARTICLE VII

LIMITATION OF LIABILITY

A Director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a Director, except for liability (a) for any breach of the Director's duty of loyalty to the Corporation or its stockholders, (b) for acts or omissions not in good faith or which involve intentional misconduct or a knowing violation of law, (c) under Section 174 of the DGCL or (d) for any transaction from which the Director derived an improper personal benefit. If the DGCL is amended after the effective date of this Certificate to authorize corporate action further eliminating or limiting the personal liability of Directors, then the liability of a Director of the Corporation shall be eliminated or limited to the fullest extent permitted by the DGCL, as so amended.

Any repeal or modification of this Article VII by either of (i) the stockholders of the Corporation or (ii) an amendment to the DGCL, shall not adversely affect any right or protection existing at the time of such repeal or modification with respect to any acts or omissions occurring before such repeal or modification of a person serving as a Director at the time of such repeal or modification.

ARTICLE VIII

AMENDMENT OF BY-LAWS

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

2. Amendment by Stockholders. The By-laws of the Corporation may be amended or repealed at any annual meeting of stockholders, or special meeting of stockholders called for such purpose as provided in the By-laws, 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.

ARTICLE IX

AMENDMENT OF CERTIFICATE OF INCORPORATION

The Corporation reserves the right to amend or repeal this Certificate in the manner now or hereafter prescribed by statute and this Certificate, and all rights conferred upon stockholders herein are granted subject to this reservation. Whenever any vote of the holders of voting stock is required to amend or repeal any provision of this Certificate, and in addition to any other vote of holders of voting stock that is required by this Certificate or by law, such amendment or repeal shall require the affirmative vote of the majority of the outstanding shares entitled to vote on such amendment or repeal, and the affirmative vote of the majority of the outstanding shares of each class entitled to vote thereon as a class, at a duly constituted meeting of stockholders called expressly for such purpose; provided, however, that the affirmative vote of not less than 75% of

the outstanding shares entitled to vote on such amendment or repeal, and the affirmative vote of not less than 75% of the outstanding shares of each class entitled to vote thereon as a class, shall be required to amend or repeal any provision of Article V, Article VI, Article VII, Article VIII or Article IX of this Certificate.

[End of Text]

THIS AMENDED AND RESTATED CERTIFICATE OF INCORPORATION is executed as of this 15th day of November, 2006.

METABOLIX, INC.

By: /s/ James Barber

Name: James Barber

Title: Chief Executive Officer and President

Exhibit 10.1

YIELD10 BIOSCIENCE, INC.

2018 STOCK OPTION AND INCENTIVE PLAN

1. DEFINITIONS.

Unless otherwise specified or unless the context otherwise requires, the following terms, as used in this Yield10 Bioscience, Inc. 2018 Stock Option and Incentive Plan, have the following meanings:

Administrator means the Board of Directors, unless it has delegated power to act on its behalf to the Committee, in which case the term Administrator means the Committee.

Affiliate means a corporation which, for purposes of Section 424 of the Code, is a parent or subsidiary of the Company, direct or indirect.

Agreement means a written or electronic document setting forth the terms of a Stock Right delivered pursuant to the Plan in such form as the Administrator shall approve.

Board of Directors means the Board of Directors of the Company.

Cause means, with respect to a Participant (a) dishonesty with respect to the Company or any Affiliate, (b) insubordination, substantial malfeasance or non-feasance of duty, (c) unauthorized disclosure of confidential information, (d) breach by a Participant of any provision of any employment, consulting, advisory, nondisclosure, non-competition or similar agreement between the Participant and the Company or any Affiliate, and (e) conduct substantially prejudicial to the business of the Company or any Affiliate; provided, however, that any provision in an agreement between a Participant and the Company or an Affiliate, which contains a conflicting definition of Cause for termination and which is in effect at the time of such termination, shall supersede this definition with respect to that Participant. The determination of the Administrator as to the existence of Cause will be conclusive on the Participant and the Company.

Change of Control means the occurrence of any of the following events:

Ownership. Any “Person” (as such term is used in Sections 13(d) and 14(d) of the Exchange Act) becomes the “Beneficial Owner” (as defined in Rule 13d-3 under the Exchange Act), directly or indirectly, of securities of the Company representing 50% or more of the total voting power represented by the Company’s then outstanding voting securities (excluding for this purpose any such voting securities held by the Company or its Affiliates or by any employee benefit plan of the Company) pursuant

to a transaction or a series of related transactions which the Board of Directors does not approve; or

Merger/Sale of Assets. (A) A merger or consolidation of the Company whether or not approved by the Board of Directors, other than a merger or consolidation which would result in the voting securities of the Company outstanding immediately prior thereto continuing to represent (either by remaining outstanding or by being converted into voting securities of the surviving entity or the parent of such corporation) more than 50% of the total voting power represented by the voting securities of the Company or such surviving entity or parent of such corporation, as the case may be, outstanding immediately after such merger or consolidation; or (B) the sale or disposition by the Company of all or substantially all of the Company's assets in a transaction requiring shareholder approval; or

Change in Board Composition. A change in the composition of the Board of Directors, as a result of which fewer than a majority of the directors are Incumbent Directors. "Incumbent Directors" shall mean directors who either (A) are directors of the Company as of May 23, 2018, or (B) are elected, or nominated for election, to the Board of Directors with the affirmative votes of at least a majority of the Incumbent Directors at the time of such election or nomination (but shall not include an individual whose election or nomination is in connection with an actual or threatened proxy contest relating to the election of directors to the Company);

provided, that if any payment or benefit payable hereunder upon or following a Change of Control would be required to comply with the limitations of Section 409A(a)(2)(A)(v) of the Code in order to avoid an additional tax under Section 409A of the Code, such payment or benefit shall be made only if such Change in Control constitutes a change in ownership or control of the Company, or a change in ownership of the Company's assets in accordance with Section 409A of the Code.

Code means the United States Internal Revenue Code of 1986, as amended including any successor statute, regulation and guidance thereto.

Committee means the committee of the Board of Directors to which the Board of Directors has delegated power to act under or pursuant to the provisions of the Plan.

Common Stock means shares of the Company's common stock, $0.01 par value per share.

Company means Yield10 Bioscience, Inc., a Delaware corporation.

Consultant means any natural person who is an advisor or consultant who provides bona fide services to the Company or its Affiliates, provided that such services are not in connection with the offer or sale of securities in a capital raising transaction, and do not directly or indirectly promote or maintain a market for the Company's or its Affiliates' securities.

Disability or Disabled means permanent and total disability as defined in Section 22(e)(3) of the Code.

Employee means any employee of the Company or of an Affiliate (including, without limitation, an employee who is also serving as an officer or director of the Company or of an Affiliate), designated by the Administrator to be eligible to be granted one or more Stock Rights under the Plan.

Exchange Act means the United States Securities Exchange Act of 1934, as amended.

Fair Market Value of a Share of Common Stock means:

If the Common Stock is listed on a national securities exchange or traded in the over-the-counter market and sales prices are regularly reported for the Common Stock, the closing or, if not applicable, the last price of the Common Stock on the composite tape or other comparable reporting system for the trading day on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date;

If the Common Stock is not traded on a national securities exchange but is traded on the over-the-counter market, if sales prices are not regularly reported for the Common Stock for the trading day referred to in clause (1), and if bid and asked prices for the Common Stock are regularly reported, the mean between the bid and the asked price for the Common Stock at the close of trading in the over-the-counter market for the trading day on which Common Stock was traded on the applicable date and if such applicable date is not a trading day, the last market trading day prior to such date; and

If the Common Stock is neither listed on a national securities exchange nor traded in the over-the-counter market, such value as the Administrator, in good faith, shall determine in compliance with applicable laws.

ISO means a stock option intended to qualify as an incentive stock option under Section 422 of the Code.

Non-Qualified Option means a stock option which is not intended to qualify as an ISO.

Option means an ISO or Non-Qualified Option granted under the Plan.

Participant means an Employee, director or Consultant of the Company or an Affiliate to whom one or more Stock Rights are granted under the Plan. As used herein, “Participant” shall include “Participant’s Survivors” where the context requires.

Performance-Based Award means a Stock Grant or Stock-Based Award which vests based on the attainment of written Performance Goals as set forth in Paragraph 9 hereof.

Performance Goals means performance goals determined by the Committee in its sole discretion and set forth in an Agreement. The satisfaction of Performance Goals shall be subject to certification by the Committee. The Committee has the authority to take appropriate action with respect to the Performance Goals (including, without limitation, making adjustments to the Performance Goals or determining the satisfaction of the Performance Goals, in each case, in connection with a Corporate Transaction) provided that any such action does not otherwise violate the terms of the Plan.

Plan means this Yield10 Bioscience, Inc. 2018 Stock Option and Incentive Plan.

Securities Act means the Securities Act of 1933, as amended.

Shares means shares of the Common Stock as to which Stock Rights have been or may be granted under the Plan or any shares of capital stock into which the Shares are changed or for which they are exchanged within the provisions of Paragraph 3 of the Plan. The Shares issued under the Plan may be authorized and unissued shares or shares held by the Company in its treasury, or both.

Stock-Based Award means a grant by the Company under the Plan of an equity award or an equity based award which is not an Option or a Stock Grant.

Stock Grant means a grant by the Company of Shares under the Plan.

Stock Right means a right to Shares or the value of Shares of the Company granted pursuant to the Plan -- an ISO, a Non-Qualified Option, a Stock Grant or a Stock-Based Award.

Survivor means a deceased Participant's legal representatives and/or any person or persons who acquired the Participant's rights to a Stock Right by will or by the laws of descent and distribution.

2. PURPOSES OF THE PLAN.

The Plan is intended to encourage ownership of Shares by Employees and directors of and certain Consultants to the Company and its Affiliates in order to attract and retain such people, to induce them to work for the benefit of the Company or of an Affiliate and to provide additional incentive for them to promote the success of the Company or of an Affiliate. The Plan provides for the granting of ISOs, Non-Qualified Options, Stock Grants and Stock-Based Awards.

3. SHARES SUBJECT TO THE PLAN.

(a) The number of Shares which may be issued from time to time pursuant to this Plan shall be the sum of: (i) one million three hundred thousand (1,300,000) shares of Common Stock and (ii) any shares of Common Stock that are represented by awards granted under the Company's 2006 Stock Option and Incentive Plan and 2014 Stock Option and Incentive Plan that are forfeited,

expire or are cancelled without delivery of shares of Common Stock or which result in the forfeiture of shares of Common Stock back to the Company on or after May 23, 2018, or the equivalent of such number of Shares after the Administrator, in its sole discretion, has interpreted the effect of any stock split, stock dividend, combination, recapitalization or similar transaction in accordance with Paragraph 25 of this Plan; provided, however, that no more than 700,000 Shares shall be added to the Plan pursuant to subsection (ii).

(b) Notwithstanding Subparagraph (a) above, the number of Shares issuable pursuant to this Plan shall be increased, on the first day of each of the Company's 2019 and 2020 fiscal years, by an amount equal to the lesser of (A) five percent (5%) of the outstanding shares of the Company's Common Stock on the last day of the immediately preceding fiscal year and (B) such smaller number of Shares as determined by the Board; provided, however, no more than 3,000,000 Shares may be issued upon the exercise of Incentive Stock Options.

(c) If an Option ceases to be "outstanding", in whole or in part (other than by exercise), or if the Company shall reacquire (at not more than its original issuance price) any Shares issued pursuant to a Stock Grant or Stock-Based Award, or if any Stock Right expires or is forfeited, cancelled, or otherwise terminated or results in any Shares not being issued, the unissued or reacquired Shares which were subject to such Stock Right shall again be available for issuance from time to time pursuant to this Plan. Notwithstanding the foregoing, if a Stock Right is exercised, in whole or in part, by tender of Shares or if the Company or an Affiliate's tax withholding obligation is satisfied by withholding Shares, the number of Shares deemed to have been issued under the Plan for purposes of the limitation set forth in Paragraph 3(a) above shall be the number of Shares that were subject to the Stock Right or portion thereof, and not the net number of Shares actually issued. In addition, Shares repurchased by the Company with the proceeds of the option exercise price may not be reissued under the Plan. However, in the case of ISOs, the foregoing provisions shall be subject to any limitations under the Code.

4. ADMINISTRATION OF THE PLAN.

The Administrator of the Plan will be the Board of Directors, except to the extent the Board of Directors delegates its authority to the Committee, in which case the Committee shall be the Administrator. Subject to the provisions of the Plan, the Administrator is authorized to:

(a) Interpret the provisions of the Plan and all Stock Rights and to make all rules and determinations which it deems necessary or advisable for the administration of the Plan;

(b) Determine which Employees, directors and Consultants shall be granted Stock Rights;

(c) Determine the number of Shares for which a Stock Right or Stock Rights shall be granted, provided however that in no event shall Stock Rights to be granted to any non-employee director under the Plan in any calendar year exceed an aggregate grant date fair value of $250,000

except that the foregoing limitation shall not apply to Stock Rights made pursuant to an election by a non-employee director to receive the Stock Rights in lieu of cash for all or a portion of cash fees to be received for service on the Board or any Committee thereof;

(d) Specify the terms and conditions upon which a Stock Right or Stock Rights may be granted;

(e) Make any adjustments in the Performance Goals included in the Performance-Based Awards;

(f) Amend any term or condition of any outstanding Stock Right, other than reducing the exercise price or purchase price or extending the expiration date of an Option, provided that (i) such term or condition as amended is not prohibited by the Plan; (ii) any such amendment shall not impair the rights of a Participant under any Stock Right previously granted without such Participant's consent or in the event of death of the Participant the Participant's Survivors; and (iii) any such amendment shall be made only after the Administrator determines whether such amendment would cause any adverse tax consequences to the Participant, including, but not limited to, the annual vesting limitation contained in Section 422(d) of the Code and described in Paragraph 6(b)(iv) below with respect to ISOs and pursuant to Section 409A of the Code;

(g) Make any adjustments in the Performance Goals included in any Performance-Based Awards; and

(h) Adopt any sub-plans applicable to residents of any specified jurisdiction as it deems necessary or appropriate in order to comply with or take advantage of any tax or other laws applicable to the Company, any Affiliate or to Participants or to otherwise facilitate the administration of the Plan, which sub-plans may include additional restrictions or conditions applicable to Stock Rights or Shares issuable pursuant to a Stock Right;

provided, however, that all such interpretations, rules, determinations, terms and conditions shall be made and prescribed in the context of potential tax consequences under Section 409A of the Code and preserving the tax status under Section 422 of the Code of those Options which are designated as ISOs. Subject to the foregoing, the interpretation and construction by the Administrator of any provisions of the Plan or of any Stock Right granted under it shall be final, unless otherwise determined by the Board of Directors, if the Administrator is the Committee. In addition, if the Administrator is the Committee, the Board of Directors may take any action under the Plan that would otherwise be the responsibility of the Committee.

To the extent permitted under applicable law, the Board of Directors or the Committee may allocate all or any portion of its responsibilities and powers to any one or more of its members and may delegate all or any portion of its responsibilities and powers to any other person selected by it. The Board of Directors or the Committee may revoke any such allocation or delegation at any time. Notwithstanding the foregoing, only the Board of Directors or the Committee shall be authorized to grant a Stock Right to any director of the Company or to any "officer" of the Company as defined by Rule 16a-1 under the Exchange Act.

5. ELIGIBILITY FOR PARTICIPATION.

The Administrator will, in its sole discretion, name the Participants in the Plan; provided, however, that each Participant must be an Employee, director or Consultant of the Company or of an Affiliate at the time a Stock Right is granted. Notwithstanding the foregoing, the Administrator may authorize the grant of a Stock Right to a person not then an Employee, director or Consultant of the Company or of an Affiliate; provided, however, that the actual grant of such Stock Right shall be conditioned upon such person becoming eligible to become a Participant at or prior to the time of the execution of the Agreement evidencing such Stock Right. ISOs may be granted only to Employees who are deemed to be residents of the United States for tax purposes. Non-Qualified Options, Stock Grants and Stock-Based Awards may be granted to any Employee, director or Consultant of the Company or an Affiliate. The granting of any Stock Right to any individual shall neither entitle that individual to, nor disqualify him or her from, participation in any other grant of Stock Rights or any grant under any other benefit plan established by the Company or any Affiliate for Employees, directors or Consultants.

6. TERMS AND CONDITIONS OF OPTIONS.

Each Option shall be set forth in an Option Agreement, duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Administrator may provide that Options be granted subject to such terms and conditions, consistent with the terms and conditions specifically required under this Plan, as the Administrator may deem appropriate including, without limitation, subsequent approval by the shareholders of the Company of this Plan or any amendments thereto. The Option Agreements shall be subject to at least the following terms and conditions:

(a) Non-Qualified Options: Each Option intended to be a Non-Qualified Option shall be subject to the terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards for any such Non-Qualified Option:

(i) Exercise Price: Each Option Agreement shall state the exercise price (per share) of the Shares covered by each Option, which exercise price shall be determined by the Administrator and shall be at least equal to the Fair Market Value per share of the Common Stock on the date of grant of the Option.

(ii) Number of Shares: Each Option Agreement shall state the number of Shares to which it pertains.

(iii) Vesting: Each Option Agreement shall state the date or dates on which it first is exercisable and the date after which it may no longer be exercised, and may provide that the Option rights accrue or become exercisable in installments over a period of months or years, or upon the occurrence of certain performance conditions or the attainment of stated goals or events.

(iv) Additional Conditions: Exercise of any Option may be conditioned upon the Participant's execution of a shareholders agreement in a form satisfactory to the Administrator providing for certain protections for the Company and its other shareholders, including requirements that:

A. The Participant's or the Participant's Survivors' right to sell or transfer the Shares may be restricted; and

B. The Participant or the Participant's Survivors may be required to execute letters of investment intent and must also acknowledge that the Shares will bear legends noting any applicable restrictions.

(v) Term of Option: Each Option shall terminate not more than ten years from the date of the grant or at such earlier time as the Option Agreement may provide.

(b) ISOs: Each Option intended to be an ISO shall be issued only to an Employee who is deemed to be a resident of the United States for tax purposes, and shall be subject to the following terms and conditions, with such additional restrictions or changes as the Administrator determines are appropriate but not in conflict with Section 422 of the Code and relevant regulations and rulings of the Internal Revenue Service:

(i) Minimum standards: The ISO shall meet the minimum standards required of Non-Qualified Options, as described in Paragraph 6(a) above, except clause (i) and (v) thereunder.

(ii) Exercise Price: Immediately before the ISO is granted, if the Participant owns, directly or by reason of the applicable attribution rules in Section 424(d) of the Code:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 100% of the Fair Market Value per share of the Common Stock on the date of grant of the Option; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, the exercise price per share of the Shares covered by each ISO shall not be less than 110% of the Fair Market Value per share of the Common Stock on the date of grant of the Option.

(iii) Term of Option: For Participants who own:

A. 10% or less of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more

than ten years from the date of the grant or at such earlier time as the Option Agreement may provide; or

B. More than 10% of the total combined voting power of all classes of stock of the Company or an Affiliate, each ISO shall terminate not more than five years from the date of the grant or at such earlier time as the Option Agreement may provide.

(iv) Limitation on Yearly Exercise: The Option Agreements shall restrict the amount of ISOs which may become exercisable in any calendar year (under this or any other ISO plan of the Company or an Affiliate) so that the aggregate Fair Market Value (determined on the date each ISO is granted) of the stock with respect to which ISOs are exercisable for the first time by the Participant in any calendar year does not exceed $100,000.

7.TERMS AND CONDITIONS OF STOCK GRANTS.

Each Stock Grant to a Participant shall state the principal terms in an Agreement duly executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company, subject to the following minimum standards:

(a) Each Agreement shall state the purchase price per share, if any, of the Shares covered by each Stock Grant, which purchase price shall be determined by the Administrator but shall not be less than the minimum consideration required by the Delaware General Corporation Law, if any, on the date of the grant of the Stock Grant;

(b) Each Agreement shall state the number of Shares to which the Stock Grant pertains;

(c) Each Agreement shall include the terms of any right of the Company to restrict or reacquire the Shares subject to the Stock Grant, including the time period or attainment of Performance Goals or such other performance criteria upon which such rights shall accrue and the purchase price therefor, if any; and

(d) Dividends (other than stock dividends to be issued pursuant to Section 25 of the Plan) may accrue but shall not be paid prior to the time, and only to the extent that, the restrictions or rights to reacquire the Shares subject to the Stock Grant lapse.

8.TERMS AND CONDITIONS OF OTHER STOCK-BASED AWARDS.

The Administrator shall have the right to grant other Stock-Based Awards based upon the Common Stock having such terms and conditions as the Administrator may determine, including, without limitation, the grant of Shares based upon certain conditions, the grant of securities convertible into Shares and the grant of stock appreciation rights, phantom stock awards or stock units. The principal terms of each Stock-Based Award shall be set forth in an Agreement, duly

executed by the Company and, to the extent required by law or requested by the Company, by the Participant. The Agreement shall be in a form approved by the Administrator and shall contain terms and conditions which the Administrator determines to be appropriate and in the best interest of the Company. Each Agreement shall include the terms of any right of the Company including the right to terminate the Stock-Based Award without the issuance of Shares, the terms of any vesting conditions, Performance Goals or events upon which Shares shall be issued provided that dividends (other than stock dividends to be issued pursuant to Section 25 of the Plan) or dividend equivalents may accrue but shall not be paid prior to and only to the extent that, the Shares subject to the Stock-Based Award vest. Under no circumstances may the Agreement covering stock appreciation rights (a) have a base price (per share) that is less than the Fair Market Value per share of Common Stock on the date of grant or (b) expire more than ten years following the date of grant.

The Company intends that the Plan and any Stock-Based Awards granted hereunder be exempt from the application of Section 409A of the Code or meet the requirements of paragraphs (2), (3) and (4) of subsection (a) of Section 409A of the Code, to the extent applicable, and be operated in accordance with Section 409A so that any compensation deferred under any Stock-Based Award (and applicable investment earnings) shall not be included in income under Section 409A of the Code. Any ambiguities in the Plan shall be construed to effect the intent as described in this Paragraph 8.

9.PERFORMANCE-BASED AWARDS.

The Committee shall determine whether, with respect to a performance period, the applicable Performance Goals have been met with respect to a given Participant and, if they have, to so certify and ascertain the amount of the applicable Performance-Based Award. No Performance-Based Awards will be issued for such performance period until such certification is made by the Committee. The number of Shares issued in respect of a Performance-Based Award determined by the Committee for a performance period shall be paid to the Participant at such time as determined by the Committee in its sole discretion after the end of such performance period and any dividends (other than stock dividends to be issued pursuant to Section 25 of the Plan) or dividend equivalents that accrue shall only be paid in respect of the number of Shares earned in respect of a Performance-Based Award.

10.EXERCISE OF OPTIONS AND ISSUE OF SHARES.

An Option (or any part or installment thereof) shall be exercised by giving written notice to the Company or its designee (in a form acceptable to the Administrator, which may include electronic notice), together with provision for payment of the aggregate exercise price in accordance with this Paragraph for the Shares as to which the Option is being exercised, and upon compliance with any other condition(s) set forth in the Option Agreement. Such notice shall be signed by the person exercising the Option (which signature may be provided electronically in a form acceptable to the Administrator), shall state the number of Shares with respect to which the Option is being exercised and shall contain any representation required by the Plan or the Option Agreement. Payment of the exercise price for the Shares as to which such Option is being exercised shall be made (a) in United States dollars in cash or by check; or (b) at the discretion of the Administrator, through delivery of shares of Common Stock held for at least six months (if required to avoid negative accounting treatment) having a Fair Market Value equal as of the date of the exercise to

the aggregate cash exercise price for the number of Shares as to which the Option is being exercised; or (c) at the discretion of the Administrator, by having the Company retain from the Shares otherwise issuable upon exercise of the Option, a number of Shares having a Fair Market Value equal as of the date of exercise to the aggregate exercise price for the number of Shares as to which the Option is being exercised; or (d) at the discretion of the Administrator, in accordance with a cashless exercise program established with a securities brokerage firm, and approved by the Administrator; or (e) at the discretion of the Administrator, by any combination of (a), (b), (c) and (d) above or (f) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine. Notwithstanding the foregoing, the Administrator shall accept only such payment on exercise of an ISO as is permitted by Section 422 of the Code.

The Company shall then reasonably promptly deliver the Shares as to which such Option was exercised to the Participant (or to the Participant's Survivors, as the case may be). In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company in order to comply with any law or regulation (including, without limitation, state securities or "blue sky" laws) which requires the Company to take any action with respect to the Shares prior to their issuance. The Shares shall, upon delivery, be fully paid, non-assessable Shares.

11. PAYMENT IN CONNECTION WITH THE ISSUANCE OF STOCK GRANTS AND STOCK-BASED AWARDS AND ISSUE OF SHARES.

Any Stock Grant or Stock-Based Award requiring payment of a purchase price for the Shares as to which such Stock Grant or Stock-Based Award is being granted shall be made (a) in United States dollars in cash or by check; or (b) at the discretion of the Administrator, through delivery of shares of Common Stock held for at least six months (if required to avoid negative accounting treatment) and having a Fair Market Value equal as of the date of payment to the purchase price of the Stock Grant or Stock-Based Award; or (c) at the discretion of the Administrator, by any combination of (a) and (b) above; or (d) at the discretion of the Administrator, by payment of such other lawful consideration as the Administrator may determine.

The Company shall when required by the applicable Agreement, reasonably promptly deliver the Shares as to which such Stock Grant or Stock-Based Award was made to the Participant (or to the Participant's Survivors, as the case may be), subject to any escrow provision set forth in the applicable Agreement. In determining what constitutes "reasonably promptly," it is expressly understood that the issuance and delivery of the Shares may be delayed by the Company in order to comply with any law or regulation (including, without limitation, state securities or "blue sky" laws) which requires the Company to take any action with respect to the Shares prior to their issuance.

12. RIGHTS AS A SHAREHOLDER.

No Participant to whom a Stock Right has been granted shall have rights as a shareholder with respect to any Shares covered by such Stock Right except after due exercise of an Option or issuance of Shares as set forth in any Agreement, tender of the aggregate exercise or purchase price, if any, for the Shares being purchased and registration of the Shares in the Company's share register in the name of the Participant.

13. ASSIGNABILITY AND TRANSFERABILITY OF STOCK RIGHTS.

By its terms, a Stock Right granted to a Participant shall not be transferable by the Participant other than (i) by will or by the laws of descent and distribution, or (ii) as approved by the Administrator in its discretion and set forth in the applicable Agreement provided that no Stock Right may be transferred by a Participant for value. Notwithstanding the foregoing, an ISO transferred except in compliance with clause (i) above shall no longer qualify as an ISO. The designation of a beneficiary of a Stock Right by a Participant, with the prior approval of the Administrator and in such form as the Administrator shall prescribe, shall not be deemed a transfer prohibited by this Paragraph. Except as provided above during the Participant's lifetime a Stock Right shall only be exercisable by or issued to such Participant (or his or her legal representative) and shall not be assigned, pledged or hypothecated in any way (whether by operation of law or otherwise) and shall not be subject to execution, attachment or similar process. Any attempted transfer, assignment, pledge, hypothecation or other disposition of any Stock Right or of any rights granted thereunder contrary to the provisions of this Plan, or the levy of any attachment or similar process upon a Stock Right, shall be null and void.

14. EFFECT ON OPTIONS OF TERMINATION OF SERVICE OTHER THAN FOR CAUSE OR DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement, in the event of a termination of service (whether as an Employee, director or Consultant) with the Company or an Affiliate before the Participant has exercised an Option, the following rules apply:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate (for any reason other than termination for Cause, Disability, or death for which events there are special rules in Paragraphs 15, 16, and 17, respectively), may exercise any Option granted to him or her to the extent that the Option is exercisable on the date of such termination of service, but only within such term as the Administrator has designated in a Participant's Option Agreement.

(b) Except as provided in Subparagraph (c) below, or Paragraph 16 or 17, in no event may an Option intended to be an ISO, be exercised later than three months after the Participant's termination of employment.

(c) The provisions of this Paragraph, and not the provisions of Paragraph 16 or 17, shall apply to a Participant who subsequently becomes Disabled or dies after the termination of employment, director status or consultancy; provided, however, in the case of a Participant's Disability or death within three months after the termination of employment, director status or consultancy, the Participant or the Participant's Survivors may exercise the Option within one year after the date of the Participant's termination of service, but in no event after the date of expiration of the term of the Option.

(d) Notwithstanding anything herein to the contrary, if subsequent to a Participant's termination of employment, termination of director status or termination of consultancy, but prior to the exercise of an Option, the Administrator determines that, either prior or subsequent to the

Participant's termination, the Participant engaged in conduct which would constitute Cause, then such Participant shall forthwith cease to have any right to exercise any Option.

(e) A Participant to whom an Option has been granted under the Plan who is absent from the Company or an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during the period of any such absence, be deemed, by virtue of such absence alone, to have terminated such Participant's employment, director status or consultancy with the Company or with an Affiliate, except as the Administrator may otherwise expressly provide; provided, however, that, for ISOs, any leave of absence granted by the Administrator of greater than three months, unless pursuant to a contract or statute that guarantees the right to reemployment, shall cause such ISO to become a Non-Qualified Option on the date that is six months following the commencement of such leave of absence.

(f) Except as required by law or as set forth in a Participant's Option Agreement, Options granted under the Plan shall not be affected by any change of a Participant's status within or among the Company and any Affiliates, so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

15.EFFECT ON OPTIONS OF TERMINATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Option Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate is terminated for Cause prior to the time that all his or her outstanding Options have been exercised:

(a) All outstanding and unexercised Options as of the time the Participant is notified his or her service is terminated for Cause will immediately be forfeited.

(b) Cause is not limited to events which have occurred prior to a Participant's termination of service, nor is it necessary that the Administrator's finding of Cause occur prior to termination. If the Administrator determines, subsequent to a Participant's termination of service but prior to the exercise of an Option, that either prior or subsequent to the Participant's termination the Participant engaged in conduct which would constitute Cause, then the right to exercise any Option is forfeited.

16.EFFECT ON OPTIONS OF TERMINATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Option Agreement:

(a) A Participant who ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability may exercise any Option granted to such Participant to the extent that the Option has become exercisable but has not been exercised on the date of the Participant's termination of service due to Disability; and in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of the Participant's termination of service due to Disability of any additional vesting rights that would have accrued on the next vesting date had the Participant not become Disabled. The proration shall be based upon the number

of days accrued in the current vesting period prior to the date of the Participant's termination of service due to Disability.

(b) A Disabled Participant may exercise the Option only within the period ending one year after the date of the Participant's termination of service due to Disability, notwithstanding that the Participant might have been able to exercise the Option as to some or all of the Shares on a later date if the Participant had not been terminated due to Disability and had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

(c) The Administrator shall make the determination both of whether Disability has occurred and the date of its occurrence (unless a procedure for such determination is set forth in another agreement between the Company and such Participant, in which case such procedure shall be used for such determination). If requested, the Participant shall be examined by a physician selected or approved by the Administrator, the cost of which examination shall be paid for by the Company.

17. EFFECT ON OPTIONS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Option Agreement:

(a) In the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate, such Option may be exercised by the Participant's Survivors to the extent that the Option has become exercisable but has not been exercised on the date of death; and in the event rights to exercise the Option accrue periodically, to the extent of a pro rata portion through the date of death of any additional vesting rights that would have accrued on the next vesting date had the Participant not died. The proration shall be based upon the number of days accrued in the current vesting period prior to the Participant's date of death.

(b) If the Participant's Survivors wish to exercise the Option, they must take all necessary steps to exercise the Option within one year after the date of death of such Participant, notwithstanding that the decedent might have been able to exercise the Option as to some or all of the Shares on a later date if he or she had not died and had continued to be an Employee, director or Consultant or, if earlier, within the originally prescribed term of the Option.

18. EFFECT OF TERMINATION OF SERVICE ON UNACCEPTED STOCK GRANTS AND STOCK-BASED AWARDS.

In the event of a termination of service (whether as an Employee, director or Consultant) with the Company or an Affiliate for any reason before the Participant has accepted a Stock Grant or a Stock-Based Award and paid the purchase price, if required, such grant shall terminate.

For purposes of this Paragraph 18 and Paragraph 19 below, a Participant to whom a Stock Grant or a Stock-Based Award has been issued under the Plan who is absent from work with the Company or with an Affiliate because of temporary disability (any disability other than a Disability as defined in Paragraph 1 hereof), or who is on leave of absence for any purpose, shall not, during

the period of any such absence, be deemed, by virtue of such absence alone, to have terminated such Participant's employment, director status or consultancy with the Company or with an Affiliate, except as the Administrator may otherwise expressly provide.

In addition, for purposes of this Paragraph 18 and Paragraph 19 below, any change of employment or other service within or among the Company and any Affiliates shall not be treated as a termination of employment, director status or consultancy so long as the Participant continues to be an Employee, director or Consultant of the Company or any Affiliate.

19. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF TERMINATION OF SERVICE OTHER THAN FOR CAUSE, DEATH OR DISABILITY.

Except as otherwise provided in a Participant's Agreement, in the event of a termination of service for any reason (whether as an Employee, director or Consultant), other than termination for Cause, death or Disability for which there are special rules in Paragraphs 20, 21, and 22 below, before all forfeiture provisions or Company rights of repurchase shall have lapsed, then the Company shall have the right to cancel or repurchase that number of Shares subject to a Stock Grant or Stock-Based Award as to which the Company's forfeiture or repurchase rights have not lapsed.

20. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF TERMINATION OF SERVICE FOR CAUSE.

Except as otherwise provided in a Participant's Agreement, the following rules apply if the Participant's service (whether as an Employee, director or Consultant) with the Company or an Affiliate is terminated for Cause:

(a) All Shares subject to any Stock Grant or Stock-Based Award that remain subject to forfeiture provisions or as to which the Company shall have a repurchase right shall be immediately forfeited to the Company as of the time the Participant is notified his or her service is terminated for Cause.

(b) Cause is not limited to events which have occurred prior to a Participant's termination of service, nor is it necessary that the Administrator's finding of Cause occur prior to termination. If the Administrator determines, subsequent to a Participant's termination of service, that either prior or subsequent to the Participant's termination the Participant engaged in conduct which would constitute Cause, then all Shares subject to any Stock Grant or Stock-Based Award that remained subject to forfeiture provisions or as to which the Company had a repurchase right on the date of termination shall be immediately forfeited to the Company.

21. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF TERMINATION OF SERVICE FOR DISABILITY.

Except as otherwise provided in a Participant's Agreement, the following rules apply if a Participant ceases to be an Employee, director or Consultant of the Company or of an Affiliate by reason of Disability: to the extent the forfeiture provisions or the Company's rights of repurchase

have not lapsed on the date of Disability, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant or Stock-Based Award through the date of Disability as would have lapsed had the Participant not become Disabled. The proration shall be based upon the number of days accrued prior to the date of Disability.

The Administrator shall make the determination both as to whether Disability has occurred and the date of its occurrence (unless a procedure for such determination is set forth in another agreement between the Company and such Participant, in which case such procedure shall be used for such determination). If requested, the Participant shall be examined by a physician selected or approved by the Administrator, the cost of which examination shall be paid for by the Company.

22. EFFECT ON STOCK GRANTS AND STOCK-BASED AWARDS OF DEATH WHILE AN EMPLOYEE, DIRECTOR OR CONSULTANT.

Except as otherwise provided in a Participant's Agreement, the following rules apply in the event of the death of a Participant while the Participant is an Employee, director or Consultant of the Company or of an Affiliate: to the extent the forfeiture provisions or the Company's rights of repurchase have not lapsed on the date of death, they shall be exercisable; provided, however, that in the event such forfeiture provisions or rights of repurchase lapse periodically, such provisions or rights shall lapse to the extent of a pro rata portion of the Shares subject to such Stock Grant or Stock-Based Award through the date of death as would have lapsed had the Participant not died. The proration shall be based upon the number of days accrued prior to the Participant's date of death.

23. PURCHASE FOR INVESTMENT.

Unless the offering and sale of the Shares shall have been effectively registered under the Securities Act, the Company shall be under no obligation to issue Shares under the Plan unless and until the following conditions have been fulfilled:

(a) The person who receives a Stock Right shall warrant to the Company, prior to the receipt of Shares, that such person is acquiring such Shares for his or her own account, for investment, and not with a view to, or for sale in connection with, the distribution of any such Shares, in which event the person acquiring such Shares shall be bound by the provisions of the following legend (or a legend in substantially similar form) which shall be endorsed upon the certificate evidencing the Shares issued pursuant to such exercise or such grant of a Stock Right:

> "The shares represented by this certificate have been taken for investment and they may not be sold or otherwise transferred by any person, including a pledgee, unless (1) either (a) a Registration Statement with respect to such shares shall be effective under the Securities Act of 1933, as amended, or (b) the Company shall have received an opinion of counsel satisfactory to it that an exemption from registration under such Act is then available, and (2) there shall have been compliance with all applicable state securities laws."

(b) At the discretion of the Administrator, the Company shall have received an opinion of its counsel that the Shares may be issued in compliance with the Securities Act without registration thereunder.

24.DISSOLUTION OR LIQUIDATION OF THE COMPANY.

Upon the dissolution or liquidation of the Company, all Options granted under this Plan which as of such date shall not have been exercised and all Stock Grants and Stock-Based Awards which have not been accepted, to the extent required under the applicable Agreement, will terminate and become null and void; provided, however, that if the rights of a Participant or a Participant's Survivors have not otherwise terminated and expired, the Participant or the Participant's Survivors will have the right immediately prior to such dissolution or liquidation to exercise or accept any Stock Right to the extent that the Stock Right is exercisable or subject to acceptance as of the date immediately prior to such dissolution or liquidation. Upon the dissolution or liquidation of the Company, any outstanding Stock-Based Awards shall immediately terminate unless otherwise determined by the Administrator or specifically provided in the applicable Agreement.

25.ADJUSTMENTS.

Upon the occurrence of any of the following events, a Participant's rights with respect to any Stock Right granted to him or her hereunder shall be adjusted as hereinafter provided, unless otherwise specifically provided in a Participant's Agreement.

(a) Stock Dividends and Stock Splits. If (i) the shares of Common Stock shall be subdivided or combined into a greater or smaller number of shares or if the Company shall issue any shares of Common Stock as a stock dividend on its outstanding Common Stock, or (ii) additional shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such shares of Common Stock, each Stock Right and the number of shares of Common Stock deliverable thereunder shall be appropriately increased or decreased proportionately, and appropriate adjustments shall be made including, in the exercise, base or purchase price per share, and the Performance Goals applicable to outstanding Performance-Based Awards to reflect such events. The number of Shares subject to the limitations in Paragraph 3(a), 3(b) and 4(c) shall also be proportionately adjusted upon the occurrence of such events.

(b) Corporate Transactions. If the Company is to be consolidated with or acquired by another entity in a merger, consolidation, or sale of all or substantially all of the Company's assets or the acquisition of all of the outstanding voting stock of the Company in a single transaction or a series of related transactions by a single entity other than a transaction to merely change the state of incorporation (a "Corporate Transaction"), the Administrator or the board of directors of any entity assuming the obligations of the Company hereunder (the "Successor Board"), shall, as to outstanding Options, either (i) make appropriate provision for the continuation of such Options by substituting on an equitable basis for the Shares then subject to such Options either the consideration payable with respect to the outstanding shares of Common Stock in connection with the Corporate Transaction or securities of any successor or acquiring entity; or (ii) upon written notice to the Participants, provide that such Options must be exercised (either (A) to the extent then exercisable or, (B) at the discretion of the Administrator, any such Options being made partially or fully

exercisable for purposes of this Subparagraph), within a specified number of days of the date of such notice, at the end of which period such Options which have not been exercised shall terminate; or (iii) terminate such Options in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Stock into which such Option would have been exercisable (either (A) to the extent then exercisable or, (B) at the discretion of the Administrator, any such Options being made partially or fully exercisable for purposes of this Subparagraph) less the aggregate exercise price thereof. For purposes of determining the payments to be made pursuant to Subclause (iii) above, in the case of a Corporate Transaction the consideration for which, in whole or in part, is other than cash, the consideration other than cash shall be valued at the fair value thereof as determined in good faith by the Board of Directors.

Notwithstanding the foregoing, in the event the Corporate Transaction also constitutes a Change of Control, and the Change of Control does not provide for the continuation of such Options as set forth in clause (i) above, then on the date of the Corporate Transaction all Options outstanding shall become fully exercisable as of the effective time of the Corporate Transaction, all other Stock Rights with time-based vesting, conditions or restrictions shall become fully vested and nonforfeitable as of the effective time of the Corporate Transaction, and all Performance-Based Awards may become vested and nonforfeitable in connection with the Corporate Transaction in the Administrator's discretion or to the extent specified in the relevant Agreement.

With respect to outstanding Stock Grants, the Administrator or the Successor Board, shall make appropriate provision for the continuation of such Stock Grants on the same terms and conditions by substituting on an equitable basis for the Shares then subject to such Stock Grants either the consideration payable with respect to the outstanding Shares of Common Stock in connection with the Corporate Transaction or securities of any successor or acquiring entity. In lieu of the foregoing, in connection with any Corporate Transaction, the Administrator may provide that, upon consummation of the Corporate Transaction, each outstanding Stock Grant shall be terminated in exchange for payment of an amount equal to the consideration payable upon consummation of such Corporate Transaction to a holder of the number of shares of Common Stock comprising such Stock Grant (to the extent such Stock Grant is no longer subject to any forfeiture or repurchase rights then in effect or, at the discretion of the Administrator, all forfeiture and repurchase rights being waived upon such Corporate Transaction).

In taking any of the actions permitted under this Paragraph 25(b), the Administrator shall not be obligated by the Plan to treat all Stock Rights, all Stock Rights held by a Participant, or all Stock Rights of the same type, identically.

(c) Recapitalization or Reorganization. In the event of a recapitalization or reorganization of the Company other than a Corporate Transaction pursuant to which securities of the Company or of another corporation are issued with respect to the outstanding shares of Common Stock, a Participant upon exercising an Option or accepting a Stock Grant after the recapitalization or reorganization shall be entitled to receive for the price paid upon such exercise or acceptance if any, the number of replacement securities which would have been received if such Option had been exercised or Stock Grant accepted prior to such recapitalization or reorganization.

(d) Adjustments to Stock-Based Awards. Upon the happening of any of the events described in Subparagraphs (a), (b) or (c) above, any outstanding Stock-Based Award shall be appropriately adjusted to reflect the events described in such Subparagraphs. The Administrator or the Successor Board shall determine the specific adjustments to be made under this Paragraph 25, including, but not limited to the effect of any, Corporate Transaction and Change of Control and, subject to Paragraph 4, its determination shall be conclusive.

(e) Modification of Options. Notwithstanding the foregoing, any adjustments made pursuant to Subparagraph (a), (b) or (c) above with respect to Options shall be made only after the Administrator determines whether such adjustments would (i) constitute a "modification" of any ISOs (as that term is defined in Section 424(h) of the Code) or (ii) cause any adverse tax consequences for the holders of Options, including, but not limited to, pursuant to Section 409A of the Code. If the Administrator determines that such adjustments made with respect to Options would constitute a modification or other adverse tax consequence, it may in its discretion refrain from making such adjustments, unless the holder of an Option specifically agrees in writing that such adjustment be made and such writing indicates that the holder has full knowledge of the consequences of such "modification" on his or her income tax treatment with respect to the Option. This paragraph shall not apply to the acceleration of the vesting of any ISO that would cause any portion of the ISO to violate the annual vesting limitation contained in Section 422(d) of the Code, as described in Paragraph 6(b)(iv).

26. ISSUANCES OF SECURITIES.

Except as expressly provided herein, no issuance by the Company of shares of stock of any class, or securities convertible into shares of stock of any class, shall affect, and no adjustment by reason thereof shall be made with respect to, the number or price of shares subject to Stock Rights. Except as expressly provided herein, no adjustments shall be made for dividends paid in cash or in property (including without limitation, securities) of the Company prior to any issuance of Shares pursuant to a Stock Right.

27.FRACTIONAL SHARES.

No fractional shares shall be issued under the Plan and the person exercising a Stock Right shall receive from the Company cash in lieu of such fractional shares equal to the Fair Market Value thereof.

28.WITHHOLDING.

In the event that any federal, state, or local income taxes, employment taxes, Federal Insurance Contributions Act withholdings or other amounts are required by applicable law or governmental regulation to be withheld from the Participant's salary, wages or other remuneration in connection with the issuance of a Stock Right or Shares under the Plan or for any other reason required by law, the Company may withhold from the Participant's compensation, if any, or may require that the Participant advance in cash to the Company, or to any Affiliate of the Company which employs or employed the Participant, the statutory minimum amount of such withholdings

unless a different withholding arrangement, including the use of shares of the Company's Common Stock or a promissory note, is authorized by the Administrator (and permitted by law). For purposes hereof, the fair market value of the shares withheld for purposes of payroll withholding shall be determined in the manner set forth under the definition of Fair Market Value provided in Paragraph 1 above, as of the most recent practicable date prior to the date of exercise. If the Fair Market Value of the shares withheld is less than the amount of payroll withholdings required, the Participant may be required to advance the difference in cash to the Company or the Affiliate employer.

29.NOTICE TO COMPANY OF DISQUALIFYING DISPOSITION.

Each Employee who receives an ISO must agree to notify the Company in writing immediately after the Employee makes a Disqualifying Disposition of any Shares acquired pursuant to the exercise of an ISO. A Disqualifying Disposition is defined in Section 424(c) of the Code and includes any disposition (including any sale or gift) of such Shares before the later of (a) two years after the date the Employee was granted the ISO, or (b) one year after the date the Employee acquired Shares by exercising the ISO, except as otherwise provided in Section 424(c) of the Code. If the Employee has died before such Shares are sold, these holding period requirements do not apply and no Disqualifying Disposition can occur thereafter.

30.TERMINATION OF THE PLAN.

The Plan will terminate on April 4, 2028, the date which is ten years from the earlier of the date of its adoption by the Board of Directors and the date of its approval by the shareholders of the Company. The Plan may be terminated at an earlier date by vote of the shareholders or the Board of Directors of the Company; provided, however, that any such earlier termination shall not affect any Agreements executed prior to the effective date of such termination. Termination of the Plan shall not affect any Stock Rights theretofore granted.

31.AMENDMENT OF THE PLAN AND AGREEMENTS.

The Plan may be amended by the shareholders of the Company. The Plan may also be amended by the Administrator; provided that any amendment approved by the Administrator which the Administrator determines is of a scope that requires shareholder approval shall be subject to obtaining such shareholder approval including, without limitation, to the extent necessary to qualify any or all outstanding Stock Rights granted under the Plan or Stock Rights to be granted under the Plan for favorable federal income tax treatment as may be afforded ISOs under Section 422 of the Code and to the extent necessary to qualify the Shares issuable under the Plan for listing on any national securities exchange or quotation in any national automated quotation system of securities dealers. Other than as set forth in Paragraph 25 of the Plan, the Administrator may not without shareholder approval reduce the exercise price of an Option or cancel any outstanding Option in exchange for a replacement option having a lower exercise price, any Stock Grant, any other Stock-Based Award or for cash. In addition, the Administrator not take any other action that is considered a direct or indirect "repricing" for purposes of the shareholder approval rules of the applicable securities exchange or inter-dealer quotation system on which the Shares are listed, including any other action that is treated as a repricing under generally accepted accounting principles. Any modification or amendment of the Plan shall not, without the consent of a Participant, adversely

affect his or her rights under a Stock Right previously granted to him or her, unless such amendment is required by applicable law or necessary to preserve the economic value of such Stock Right. With the consent of the Participant affected, the Administrator may amend outstanding Agreements in a manner which may be adverse to the Participant but which is not inconsistent with the Plan. In the discretion of the Administrator, outstanding Agreements may be amended by the Administrator in a manner which is not adverse to the Participant. Nothing in this Paragraph 31 shall limit the Administrator's authority to take any action permitted pursuant to Paragraph 25.

32.EMPLOYMENT OR OTHER RELATIONSHIP.

Nothing in this Plan or any Agreement shall be deemed to prevent the Company or an Affiliate from terminating the employment, consultancy or director status of a Participant, nor to prevent a Participant from terminating his or her own employment, consultancy or director status or to give any Participant a right to be retained in employment or other service by the Company or any Affiliate for any period of time.

33.SECTION 409A.

If a Participant is a "specified employee" as defined in Section 409A of the Code (and as applied according to procedures of the Company and its Affiliates) as of his separation from service, to the extent any payment under this Plan or pursuant to the grant of a Stock-Based Award constitutes deferred compensation (after taking into account any applicable exemptions from Section 409A of the Code), and to the extent required by Section 409A of the Code, no payments due under this Plan or pursuant to a Stock-Based Award may be made until the earlier of: (i) the first day of the seventh month following the Participant's separation from service, or (ii) the Participant's date of death; provided, however, that any payments delayed during this six-month period shall be paid in the aggregate in a lump sum, without interest, on the first day of the seventh month following the Participant's separation from service.

The Administrator shall administer the Plan with a view toward ensuring that Stock Rights under the Plan that are subject to Section 409A of the Code comply with the requirements thereof and that Options under the Plan be exempt from the requirements of Section 409A of the Code, but neither the Administrator nor any member of the Board, nor the Company nor any of its Affiliates, nor any other person acting hereunder on behalf of the Company, the Administrator or the Board shall be liable to a Participant or any Survivor by reason of the acceleration of any income, or the imposition of any additional tax or penalty, with respect to a Stock Right, whether by reason of a failure to satisfy the requirements of Section 409A of the Code or otherwise.

34.INDEMNITY.

Neither the Board nor the Administrator, nor any members of either, nor any employees of the Company or any parent, subsidiary, or other Affiliate, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with their responsibilities with respect to this Plan, and the Company hereby agrees to indemnify the members of the Board, the members of the Committee, and the employees of the Company and its parent or subsidiaries in respect of any claim, loss, damage, or expense (including reasonable counsel fees)

arising from any such act, omission, interpretation, construction or determination to the full extent permitted by law.

35.CLAWBACK.

Notwithstanding anything to the contrary contained in this Plan, the Company may recover from a Participant any compensation received from any Stock Right (whether or not settled) or cause a Participant to forfeit any Stock Right (whether or not vested) in the event that the Company's Clawback Policy then in effect is triggered.

36.GOVERNING LAW.

This Plan shall be construed and enforced in accordance with the law of the State of Delaware.

CONFIDENTIAL TREATMENT REQUESTED

EXCLUSIVE LICENSE AGREEMENT

THE CURATORS OF THE UNIVERSITY OF MISSOURI

THIS EXCLUSIVE LICENSE AGREEMENT ("AGREEMENT') is made and entered into on the date of the last PARTY to sign and date in the signature area ("EFFECTIVE DATE"), by and between THE CURATORS OF THE UNIVERSITY OF MISSOURI, a public corporation of the State of Missouri ("UNIVERSITY") and YIELD10 BIOSCIENCE INC., a corporation of the State of Delaware having offices at 19 Presidential Way, Woburn, MA 01801 ("LICENSEE"). UNIVERSITY and LICENSEE may sometimes be referred to herein as a "PARTY" or "PARTIES" as the case may be.

WHEREAS, UNIVERSITY has an ownership interest in the inventions described in the following: (1) UM Disclosure No. 15UMCO23 dated December 19, 2014 and titled "Increasing plant oil by altering negative regulation of acetyl CoA carboxylase" and (2) UM Disclosure No. 17UMC003 dated July 15, 2016 and titled "Increasing seed oil content by improving activity of acetyl-CoA carboxylase" and related PATENT RIGHTS as define herein (hereafter "INVENTIONS").

WHEREAS, the PATENT RIGHTS were developed under a research program sponsored by the National Science Foundation, Project No. 1339385. Therefore, this AGREEMENT is subject to the terms and conditions of the Bayh-Dole Act, Public Law 96-517 and 98-620 as amended; and

WHEREAS, LICENSEE is desirous of obtaining a license to practice the PATENT RIGHTS under the terms and conditions of this AGREEMENT; and

WHEREAS, UNIVERSITY is desirous of granting such a license to LICENSEE in accordance with the terms and conditions of this AGREEMENT.

NOW, THEREFORE, in consideration of the foregoing premises and the covenants, representations and warranties contained herein, the PARTIES agree as follows:

Article I. DEFINITIONS

Section 1.01 "AFFILIATE" means any business entity more than fifty percent (50%) owned by LICENSEE, any business entity which owns more than fifty percent (50%) of LICENSEE, or any business entity that is more than fifty percent (50%) owned by a business entity that owns more than fifty percent (50%) of LICENSEE.

Section 1.02 "COMMODITY CROP" means a crop which is a LICENSED PRODUCT that is planted on over [***] acres in each given country of the LICENSED TERRITORY in a given calendar year.

Section 1.03 "IMPROVEMENTS" shall mean any modification, enhancement, or improvement to an invention described in the PATENT RIGHTS, where such modification, enhancement, or improvement is owned by, licensed to, or otherwise controlled by LICENSEE that (a) would be infringed, either directly or indirectly, by the practice of an invention claimed in the PATENT RIGHTS; or (b) if not for the license granted under this AGREEMENT, would infringe, either directly or indirectly, one or more claims of the PATENT RIGHTS.

Section 1.04 "LICENSED FIELD" means increasing plant oil content in crops.

Section 1.05 "LICENSED PRODUCT' means any (a) product, apparatus, kit, composition, or component thereof (i) whose use, sale, offer for sale, or importation of which is covered, in whole or in part, by any issued, unexpired, or pending claim contained in the PATENT RIGHTS or (ii) which is made by any method, procedure, process, or step which is covered, in whole or in part, by any issued, unexpired, or pending claim contained in the PATENT RIGHTS; or (b) any method, procedure, process, or step which is covered, in whole or in part, by any issued, unexpired, or pending claim contained in the PATENT RIGHTS.

Section 1.06 "LICENSED TERRITORY" shall be worldwide

Section 1.07 "NET SALES" means the amount billed or invoiced and collected during any given ROYALTY PERIOD for the SALE of LICENSED PRODUCTS, less:

(a) Customary trade, quantity or cash discounts;

(b) Amounts repaid or credited by reason of rejection or return;

(c) Charges for transportation or delivery to be paid by or on behalf of LICENSEE's customer, to the extent such charges are separately stated on purchase orders, invoices or other documents of SALE; and

(d) Sales, tariff duties and/or use taxes directly imposed and with reference to particular SALES.

In calculating NET SALES, no deductions shall be made for commissions paid to individuals whether they are with independent sales agencies or regularly employed by LICENSEE and on its payroll, or for cost of collections. In the event LICENSEE SELLS a LICENSED PRODUCT to a third party in a bona fide arm's length transaction, for consideration, in whole or in part, other than cash, then the NET SALES price for such LICENSED PRODUCT shall be deemed to be the standard invoice price then being invoiced by LICENSEE in an arm's length transaction with similar entities and in the absence of such standard invoice price, then the reasonable fair market value of the LICENSED PRODUCT. For the purposes of calculating NET SALES, LICENSEE's SALES to a SUBLICENSEE or to an AFFILIATE under this AGREEMENT for end use (but not resale) by the SUBLICENSEE or the AFFILIATE shall be treated as SALES by LICENSEE at the greater of the (i) billed/invoiced price of LICENSEE, the SUBLICENSEE, or AFFILIATE or (ii) the billed/

invoiced price that LICENSEE would have charged a third party in a bona fide arm's length transaction. For the purposes of calculating NET SALES, LICENSEE's SALES to a SUBLICENSEE or to an AFFILIATE under this AGREEMENT for resale to end users by the SUBLICENSEE or an AFFILIATE shall be treated as SALES at the billed/invoiced price to the end users of SUBLICENSEE or AFFILIATE.

Section 1.08 "NICHE CROP" means a crop which is a LICENSED PRODUCT that is planted on [***] to [***] acres inclusive in each given country of the LICENSED TERRITORY in a given calendar year.

Section 1.09 "NON-COMMERCIAL RESEARCH PURPOSES" means research, teaching, educational, or academic purposes which are undertaken at UNIVERSITY or at a non-profit, academic, educational, or governmental institution. Without limiting the foregoing, NONCOMMERCIAL RESEARCH PURPOSES includes research (including sponsored research) that leads, or may lead, to patentable or unpatentable inventions that may be licensed or otherwise transferred, either directly or indirectly, to third parties.

Section 1.10 "PATENT EXPENSES" means all out-of-pocket expenses, costs, and attorneys' fees UNIVERSITY has incurred for the preparation, filing, prosecution and maintenance of the PATENT RIGHTS, including but not limited to interferences, derivation proceedings, reexaminations, reissues, oppositions, supplemental examinations, *inter parses* reviews, and post grant reviews.

Section 1.11 "PATENT RIGHTS" means UNIVERSITY'S rights in any of the following: (a) PCT patent application Serial No. PCT/US2016/041386 filed July 7, 2016 and titled "Increasing Plant Oil by Altering Negative Regulation of Acetyl Co-A Carboxylase" and PCT patent application Serial No. PCT/US2017/040851 filed July 6, 2017 and titled "Increasing Plant Oil Content by Improving Activity of Acetyl-CoA Carboxylase, ("PATENT APPLICATIONS"); and (b) any provisional, non-provisional, divisional, continuation (but not continuations-in-part), extension, renewal, re-examination, reissue, substitute, supplementary protection certificate, utility model, or similar legal protection claiming priority to or from one or more of the PATENT APPLICATIONS; and (c) any corresponding foreign applications or patents thereof. All of the foregoing will be automatically incorporated in and added to this AGREEMENT and shall periodically be added to Appendix A attached to this AGREEMENT and made part thereof.

Section 1.12 "ROYALTY PERIOD(S)" means the annual period ending on December 31 of each calendar year.

Section 1.13 "SALE", "SELL", or "SOLD" means the sale, use, transfer, distribution or disposition of a LICENSED PRODUCT for value to a third party.

Section 1.14 "SALES ROYALTY" means a running royalty equal to a percentage of NET SALES for LICENSED PRODUCTS SOLD by LICENSEE or SUBLICENSEE.

Section 1.15 "SUBLICENSEE" means any person or entity to whom LICENSEE transfers any right or interest granted to LICENSEE by UNIVERSITY under this AGREEMENT and who is not an AFFILIATE.

Article II. GRANT

Section 2.01 Grant. Subject to the terms and conditions of this AGREEMENT, UNIVERSITY hereby grants to LICENSEE and LICENSEE accepts a royalty-bearing, exclusive license under the PATENT RIGHTS to make, have made, use, offer to SELL, SELL, have SOLD, import, distribute, or otherwise transfer LICENSED PRODUCTS within the LICENSED TERRITORY for use within LICENSED FIELD for a term as set forth in Section 10.01 unless this AGREEMENT shall be sooner terminated according to the terms hereof. For the avoidance of doubt, this grant is subject to the rights retained by UNIVERSITY in Section 2.04, UNIVERSITY's publication rights in Section 2.07, and any rights of the GOVERNMENT as set forth in Section 2.08.

If UNIVERSITY receives a request from a third party accompanied by a complete commercialization plan for commercial development of the PATENT RIGHTS within LICENSEE's LICENSED FIELD but directed to any plants other than camelina, canola, and soybeans within that LICENSED FIELD or any other plant that is not otherwise specifically under development by the LICENSEE as specified in the COMMERCIALIZATION PLAN set forth in Appendix B ("NEW PLANT FIELD"), the UNIVERSITY may notify LICENSEE, in writing, of the existence of the third party's request. Upon receipt of such written notice from the UNIVERSITY, LICENSEE shall either:

(a) within [***] days, amend its COMMERCIALIZATION PLAN in a manner acceptable to UNIVERSITY to include a commercial research and development program for the proposed third party's commercial development of the PATENT RIGHTS in the NEW PLANT FIELD, including revised milestones, wherein acceptance of the amendment to the COMMERCIALIZATION PLAN by UNIVERSITY shall take into account LICENSEE's ongoing research and development efforts and progress; or

(b) within [***] days, amend its COMMERCIALIZATION PLAN in a manner acceptable to UNIVERSITY and the third party to include a joint research and development program with the third party for the proposed third party's commercial development of the PATENT RIGHTS in the NEW PLANT FIELD within the LICENSED FIELD; or

(c) within [***] days, grant a sublicense under commercially reasonable terms to the third party for the PATENT RIGHTS for the NEW PLANT FIELD; or

(d) within [***] days, complete both (b) and (c).

If LICENSEE does not complete (a), (b), (c), or (d) as specified above in a manner that is approved by the UNIVERSITY, then UNIVERSITY shall have the right to reduce the LICENSEE's LICENSED FIELD to exclude the NEW PLANT FIELD from the LICENSED FIELD. UNIVERSITY shall be free to license the PATENT RIGHTS in the NEW PLANT FIELD to the third party, and LICENSEE's LICENSED FIELD shall be limited to the remaining applicable plants within the LICENSED FIELD.

Section 2.02 Affiliates. The license granted to LICENSEE may be extended to an AFFILIATE of LICENSEE as well, on the condition that UNIVERSITY first receives written notice, signed on behalf of both LICENSEE and the AFFILIATE: (a) stating that the AFFILIATE intends to exercise such rights, and (b) agreeing that the AFFILIATE and LICENSEE shall be jointly and severally liable for all obligations to UNIVERSITY under this AGREEMENT arising from the activities of that AFFILIATE. The activities or omissions of the AFFILIATE under this AGREEMENT shall then be deemed to be the activities of LICENSEE. The rights of an AFFILIATE under this AGREEMENT shall terminate if LICENSEE's rights under this AGREEMENT terminate. An AFFILIATE may not assign or otherwise transfer any rights under this AGREEMENT, without the prior written consent of UNIVERSITY. If an entity ceases to be an AFFILIATE, then all of such entity's rights under this AGREEMENT shall terminate.

Section 2.03 Sublicenses. The license granted in Section 2.01 above shall include the right to grant written sublicenses, subject to UNIVERSITY's prior written approval which approval shall not be unreasonably withheld. SUBLICENSEE shall have no right to grant further sublicenses. In determining whether to approve a sublicense (or any amendment thereto), UNIVERSITY will consider, among other things, whether the provisions of the proposed sublicense are consistent with and similar to those required of LICENSEE by this AGREEMENT. All sublicenses must comply with the following:

(a) LICENSEE shall deliver to UNIVERSITY a true and correct copy of each fully executed sublicense granted by LICENSEE, and any modification or termination thereof, within [***] days after execution, modification, or termination.

(b) LICENSEE shall deliver to UNIVERSITY copies of all reports due to LICENSEE from SUBLICENSEE within [***] days receipt of such reports by LICENSEE.

(c) LICENSEE shall, at such times as UNIVERSITY directs and at UNIVERSITY's request, permit the inspection of SUBLICENSEE's records by UNIVERSITY's auditors or an independent certified public accountant selected by UNIVERSITY under the terms of Section 4.05.

(d) No sublicense shall relieve LICENSEE of its representations, warranties, or obligations under this AGREEMENT. LICENSEE shall be responsible to UNIVERSITY for the performance of its

SUBLICENSEES under each sublicense agreement granting rights to any PATENT RIGHTS. LICENSEE shall collect and guarantee all payments due UNIVERSITY from any SUBLICENSEE.

(e) Any sublicense granted by LICENSEE to a SUBLICENSEE shall incorporate all of the representations, warranties, terms, conditions, and obligations of this AGREEMENT, which shall be binding upon each SUBLICENSEE as if such SUBLICENSEE were a party to this AGREEMENT. LICENSEE shall require that any sublicense agreement:

(i) be consistent with the terms, conditions, covenants, warranties, representations, limitations, obligations, and duties of LICENSEE under this AGREEMENT;

(ii) prohibit the SUBLICENSEE from granting further sublicenses; and

(iii) contain express provisions under which the SUBLICENSEE expressly accepts duties and obligations at least equivalent to those accepted by the LICENSEE in the following sections of this AGREEMENT: Section 2.04 (reserved rights), Section 2.05 (license to University), Section 2.07 (publication), Section 2.08 (governmental rights), Section 3.09 (challenge to patent rights), Section 4.03 (reporting), Section 4.05 (records), Section 6.01 (indemnity), Section 6.02 (insurance), Section 6.03 (disclaimer of warranties), Section 6.04 (damages exclusion/ limitation of remedies), Section 6.06 (sublicenses) Section 7.04 (entity status), Section 10.05 (assignment of sublicenses), Section 11.01 (marking), Section 11.02 (compliance with laws / export controls), Section 11.03 (university name), and Section 11.11 (severability).

(f) If any sublicense agreement granting any rights to the PATENT RIGHTS does not comport with above requirements in Section 2.03(e), then that agreement shall be invalid, unenforceable, and void.

(g) Upon any termination of this AGREEMENT, all SUBLICENSEE's rights shall also terminate except as set forth in Section 10.05 (assignment of sublicenses).

Section 2.04 Reserved Rights. UNIVERSITY reserves the right to make, use or otherwise practice the PATENT RIGHTS solely for NON-COMMERCIAL RESEARCH PURPOSES and to grant nonexclusive licenses to non-profit, academic, educational, or governmental institutions a royalty-free right to make, use or otherwise practice the PATENT RIGHTS solely for NONCOMMERCIAL RESEARCH PURPOSES. UNIVERSITY also reserves the right to transfer tangible research materials and intangible materials incorporating the PATENT RIGHTS to other non-profit, academic, educational, or governmental institutions for such NON-COMMERCIAL RESEARCH PURPOSES. LICENSEE agrees that, notwithstanding any other provision of this AGREEMENT, that LICENSEE has no right to enforce the PATENT RIGHTS against UNIVERSITY or any non-profit, academic, educational, or governmental institution with respect to such use or practice for NON-COMMERCIAL RESEARCH PURPOSES.

Section 2.05 License to University. LICENSEE hereby grants, and shall require its SUBLICENSEE(s) to grant to UNIVERSITY, a nonexclusive, royalty-free, irrevocable, paid-up license, with the right to grant sublicenses to non-profit, academic, educational, or governmental

institutions, to practice and use IMPROVEMENTS solely for NON-COMMERCIAL RESEARCH PURPOSES.

Section 2.06 License Scope. The license granted herein shall not be construed to confer any rights upon LICENSEE by implication, estoppel or otherwise as to any technology not specifically set forth in PATENT RIGHTS. UNIVERSITY shall be free to grant commercial licenses to the PATENT RIGHTS to third parties in all fields outside the LICENSED FIELD and/or outside the LICENSED TERRITORY.

Section 2.07 Publication. LICENSEE agrees that UNIVERSITY shall have a right to publish any research results or technical data related to or arising out of the PATENT RIGHTS in accordance with UNIVERSITY's general policies and that this AGREEMENT shall not restrict, in any fashion, UNIVERSITY's right to publish. Notwithstanding the above, the UNIVERSITY shall provide the proposed publication or presentation to LICENSEE for review at least [***] days before proposed date of disclosure. LICENSEE shall have [***] days from receipt of the proposed publication or presentation in which to review the same for a disclosure of LICENSEE CONFIDENTIAL INFORMATION and for disclosure of any patentable subject matter covered by the PATENT RIGHTS. If LICENSEE reasonably believes that a disclosure of patentable subject matter covered by the PATENT RIGHTS is contained in the proposed publication or presentation, LICENSEE shall so notify the UNIVERSITY and may request that the UNIVERSITY delay submission for publication for an additional [***] days to enable the UNIVERSITY to make a decision about the preparation and filing or not of one or more patent applications by UNIVERSITY covered by the PATENT RIGHTS.

Section 2.08 Governmental Rights. LICENSEE understands that the PATENT RIGHTS were developed under a funding agreement with the Government of the United States of America ("GOVERNMENT") and that the GOVERNMENT may have certain rights relative thereto. Thus, notwithstanding anything hereunder, any and all licenses and other rights granted hereunder are limited by and subject to the rights and requirements of the GOVERNMENT which may arise out of its sponsorship of the research which led to the conception or reduction to practice of the PATENT RIGHTS. The GOVERNMENT is entitled, as a right, under the provisions of 35 U.S.C. §§ 200-212 and applicable regulations of Title 37 of the Code of Federal Regulations: (a) to a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on the behalf of the GOVERNMENT any of the PATENT RIGHTS throughout the world and (b) to exercise march in rights on PATENT RIGHTS. This AGREEMENT shall be exclusive, to the extent allowed in accordance with Public Laws 96-517 and 98-620 in the LICENSED FIELD and is explicitly made subject to the GOVERNMENT's rights under such GOVERNMENT funding agreement and any applicable law or regulation. If there is a conflict between the GOVERNMENT funding agreement, applicable law or regulation and this AGREEMENT, the terms of the GOVERNMENT funding agreement, applicable law or regulation shall prevail. LICENSEE agrees to take any actions necessary to enable UNIVERSITY to satisfy its obligations with the GOVERNMENT relating to

the PATENT RIGHTS. LICENSEE agrees, during the period of exclusivity of this license in the United States, that any LICENSED PRODUCT produced for SALE in the United States will be manufactured substantially in the United States as required by 35 U.S.C. § 204.

Article III. PAYMENTS

Section 3.01 License Payments: In consideration of rights granted by UNIVERSITY to LICENSEE under this AGREEMENT, LICENSEE will pay UNIVERSITY the following:

(a) License Execution Payment. LICENSEE shall pay to UNIVERSITY a nonrefundable license execution fee in the amount of [***] dollars ($[***]), due and payable in two (2) installments as follows:

(i) [***] dollars ($[***]) due and payable within [***] of the EFFECTIVE DATE of this AGREEMENT; and

(ii) [***] dollars ($[***]) due and payable within [***] of the EFFECTIVE DATE of this AGREEMENT.

(b) Running Royalty / Earned Royalty. LICENSEE shall pay UNIVERSITY a SALES ROYALTY equal to:

(i) [***] percent ([***]%) for a NICHE CROP; and

(ii) [***] percent ([***]%) for a COMMODITY CROP.

A SALES ROYALTY accrues when LICENSED PRODUCTS are invoiced or shipped, whichever occurs first.

(c) Minimum Annual Royalty Payment. LICENSEE shall pay to UNIVERSITY a nonrefundable minimum annual royalty of [***] dollars ($[***]) due and payable beginning on the [***] of the EFFECTIVE DATE of this AGREEMENT. Each minimum annual royalty payment is creditable against SALES ROYALTY due UNIVERSITY during the [***] month period following each date the minimum annual royalty becomes due and is subsequently paid. For the avoidance of doubt, such minimum annual royalty shall be considered a payment in advance of royalties yet to accrue.

If the LICENSEE sponsors research directed towards the INVENTIONS and PATENT RIGHTS in the laboratory of Dr. Jay Thelen at the UNIVERSITY pursuant to a fully-costed written sponsored research agreement, including facilities, administration, and other overhead costs, entered into by the PARTIES during a [***] month period preceding the date when a given minimum annual royalty would otherwise be due and payable to UNIVERSITY for an amount greater than the minimum annual royalty payment due, then the subsequent minimum annual royalty payment in the [***] will be waived by UNIVERSITY.

(d) Milestone Payments. LICENSEE shall pay UNIVERSITY a milestone payment fee within [***] days of achieving each milestone in accordance with the following schedule:

(i) Upon the first regulatory filing for each LICENSED PRODUCT in any country, LICENSEE shall pay UNIVERSITY [***] dollars ($[***]);

(ii) Upon each regulatory approval for each LICENSED PRODUCT, LICENSEE will pay UNIVERSITY [***] dollars ($[***]).

(iii) Upon the first SALE for each LICENSED PRODUCT which is determined to be a NICHE CROP within any country in the LICENSED TERRITORY at the earliest instance when the crop's planting totals are able to be determined during the given calendar year, LICENSEE will pay to UNIVERSITY:

1) [***] dollars ($[***]) if the LICENSED PRODUCT, which is a NICHE CROP, proceeded through one or more regulatory approval processes to trigger the milestone payment fees in Section 3.01(d)(i) and Section 3.01(d)(ii); or

2) [***] dollars ($[***]) if the LICENSED PRODUCT, which is a NICHE CROP, did not proceed through one or more regulatory approval processes to trigger the milestone payment fees in Section 3.01(d)(i) and Section 3.01(d)(ii).

(iv) Upon the first SALE for each LICENSED PRODUCT which is determined to be a COMMODITY CROP within any country in the LICENSED TERRITORY at the earliest instance when the crop's planting totals are able to be determined during the given calendar year, LICENSEE will pay to UNIVERSITY:

1) [***] dollars ($[***]) if the LICENSED PRODUCT, which is a COMMODITY CROP, proceeded through one or more regulatory approval processes to trigger the milestone payment fees in Section 3.01(d)(i) and Section 3.01(d)(ii); or

2) [***] dollars ($[***]) if the LICENSED PRODUCT, which is a COMMODITY CROP, did not proceed through one or more regulatory approval processes to trigger the milestone payment fees in Section 3.01(d)(i) and Section 3.01(d)(ii).

For avoidance of doubt, filing for and/or receiving non-regulated status with the United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) for any particular LICENSED PRODUCT shall not be considered a first regulatory filing and/or regulatory approval under Section 3.01(d)(i) and Section 3.01(d)(ii), respectively.

Milestone fees are non-refundable and royalty payments in a given license year shall not be creditable against any milestone fees.

Section 3.02 Sublicense Royalties and Fees

(a) Sublicensee Earned Royalty. LICENSEE shall pay to UNIVERSITY a SALES ROYALTY for NET SALES made by SUBLICENSEE equal to:

(i) [***] percent ([***]%) for each LICENSED PRODUCT which is a NICHE CROP; and

(ii) [***] percent ([***]%) for each LICENSED PRODUCT which is a COMMODITY CROP.

(b) Other Sublicensee Payments. In consideration of rights granted by UNIVERSITY to LICENSEE under this AGREEMENT, in addition to the SUBLICENSEE earned royalty of Section 3.02(a), LICENSEE further agrees to pay UNIVERSITY an additional royalty on the basis of all other revenue or consideration received from any SUBLICENSEE as follows:

(i) [***] percent ([***]%) if the LICENSEE sublicenses the PATENT RIGHTS to one or more SUBLICENSEES [***] at least one LICENSED PRODUCT which is a [***] at least one oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower;

(ii) [***] percent ([***]%) if the LICENSEE sublicenses the PATENT RIGHTS to one or more SUBLICENSEES [***] for LICENSED PRODUCT which is an oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower, but [***] as set forth in subsection (iii);

(iii) [***] percent ([***]%) if the LICENSEE sublicenses the PATENT RIGHTS to one or more SUBLICENSEES [***] of a LICENSED PRODUCT which is an oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower, but [***] at least one LICENSED PRODUCT [***] in the respective LICENSED FIELD and within the country or countries of the LICENSED TERRITORY as set forth in subsection (iv); and

(iv) [***] percent ([***]%) if the LICENSEE sublicenses the PATENT RIGHTS to one or more SUBLICENSEES [***] at least one LICENSED PRODUCT [***] in the respective LICENSED FIELD and within the country or countries of the LICENSED TERRITORY.

Such revenue or other consideration shall include, but not be limited to, all option fees, license issue fees (up-front payments), license maintenance fees, milestone payments, equity, joint marketing fees, research and development funding in excess of LICENSEE's cost of performing such research and development, and all other royalty payments (other than the earned royalty specified in Section 3.01(b)).

If a SUBLICENSEE desires to provide the LICENSEE with research and development funding as part of the sublicensing considerations for additional research and development activities that the LICENSEE and UNIVERSITY desire to be subcontracted to the UNIVERSITY, then UNIVERSITY and LICENSEE will negotiate in good faith a sponsored research agreement for the UNIVERSITY to perform these research and development activities commensurate with the goals and timelines under which the LICENSEE receives such funding from a SUBLICENSEE.

Section 3.03 Royalty Stacking. If, in order to make, use, import or SELL LICENSED PRODUCTS under the PATENT RIGHTS, it becomes reasonably necessary for LICENSEE to obtain a royalty-bearing license to other patent(s) owned or controlled by a third party ("THIRD PARTY PATENTS") to avoid infringement of the THIRD PARTY PATENTS to the extent that LICENSED PRODUCTS could not be made, used or sold without infringing the THIRD PARTY PATENTS, then the earned

royalty rate in Section 3.01(b) shall be adjusted by an amount equal to [***] percent ([***]%) of the royalty rate paid to the THIRD PARTY, provided that in no event shall the royalties otherwise due UNIVERSITY be less than [***] percent ([***]%) of the royalties that would be payable to UNIVERSITY absent the effects of this section. Thus, for clarity, the adjusted SALES ROYALTY in Section 3.01(b) shall never be reduced below [***] percent ([***]%) for each LICENSED PRODUCT which is a NICHE CROP and [***] percent ([***]%) for each LICENSED PRODUCT which is a COMMODITY CROP.

Section 3.04 Combination Products. In the event that a LICENSED PRODUCT is SOLD in combination with another product or method which themselves are not a LICENSED PRODUCT ("COMBINATION PRODUCTS"), the royalty rate payable on such COMBINATION PRODUCTS will be the royalty rate set forth in Section 3.01(b) applied to a pro rata portion (i.e., "X") of the NET SALES equivalent of COMBINATION PRODUCTS according to the following formula:
X = A/B, where
X = the pro rata portion of NET SALES attributable to the LICENSED PRODUCTS (expressed as a percentage), and
A = the average invoice price of the component in the COMBINATION PRODUCTS utilizing the LICENSED PRODUCTS sold separately, and
B = the average invoice price of the COMBINATION PRODUCTS.
In the event a substantial number of separate sales are not made of one or more component(s) of the COMBINATION PRODUCTS during relevant ROYALTY PERIOD so as to enable a reasonable calculation of average invoice prices of components, then NET SALES will be determined using the same formula shown above, where
A = the total COST of the component in the COMBINATION PRODUCTS utilizing LICENSED PRODUCT, and
B = the total COST of all of the products and components in the COMBINATION PRODUCTS. "COST" as used in this Section 3.04 means the actual cost paid by LICENSEE in an arm's length transaction, if purchased, or if not purchased but actually manufactured by any such LICENSEE, the sum of the manufacturing cost as determined by such LICENSEE's internal cost accounting system. The University shall have the right to review and approve LICENSEE's determination of A and B and the corresponding calculations in this Section XX, such approval not to be unreasonably withheld. Notwithstanding any of the foregoing, in no event shall the royalties otherwise due UNIVERSITY be less than [***] percent ([***]%) of the royalties that would be payable to UNIVERSITY absent the effects of this Section. Thus, for clarity, the adjusted SALES ROYALTY in Section 3.01(b) shall never be reduced below [***] percent ([***]%) for each LICENSED PRODUCT which is a NICHE CROP [***] percent ([***]%) for each LICENSED PRODUCT which is a COMMODITY CROP.

Section 3.05 How Payments are Made. All payments to UNIVERSITY pursuant to this AGREEMENT shall be paid in U.S. dollars. Conversion of foreign currency to U. S. dollars shall

be made at the conversion rate existing in the United States (as reported in the in the Wall Street Journal) on the last working day of each ROYALTY PERIOD. Such payments shall be without deduction of exchange, collection or other charges. Such payments shall be made payable to The Curators of the University of Missouri and shall be mailed to the Office of Technology Management and Industry Relations, Mizzou North, Room 706, 115 Business Loop 70 West, Columbia, MO 65211-8375.

Section 3.06 Payment Deadlines. Unless stipulated otherwise, all payments due UNIVERSITY hereunder shall be made within [***] days after the end of each ROYALTY PERIOD. Late payments shall be subject to an interest charge of [***] percent ([***]%) per month. LICENSEE shall also be responsible for payment of all bank transfer charges.

Section 3.07 No Taxes. Taxes and/or other governmental charges or fees shall not be levied on the payments made to UNIVERSITY under this Article III and shall not be deducted from any payments due UNIVERSITY under this Article III. LICENSEE shall be responsible for any and all taxes, fees, levies, duties, or other charges imposed by the government of any country on such payments.

Section 3.08 Default Payment. In the event of default in payment of any payment owing to UNIVERSITY under the terms of this AGREEMENT, and if it becomes necessary for UNIVERSITY to engage outside legal counsel to collect such payment, LICENSEE shall pay all reasonably documented expenses, costs and attorneys' fees incurred by UNIVERSITY in connection therewith. Further, in the event that UNIVERSITY prevails in a lawsuit against a SUBLICENSEE for failure to pay any royalties or other payments due, LICENSEE shall pay all expenses, costs and attorneys' fees incurred by UNIVERSITY in connection therewith. LICENSEE shall use its best commercial efforts to enforce any SUBLICENSEE obligation or payment if the breach of that obligation or payment would be a breach of this AGREEMENT if made by LICENSEE. To the extent that LICENSEE may as to UNIVERSITY cure such breach by its own performance, *e.g.*, by making any payments due to UNIVERSITY regardless of SUBLICENSEE's failure to pay LICENSEE, then LICENSEE shall do so at its own risk and expense.

Section 3.09 Challenge to Patent Rights. In the event that LICENSEE or one or more of its SUBLICENSEES directly or indirectly: (a) issues a press release, public announcement, news release alleging invalidity or unenforceability of any claim within the PATENT RIGHTS; or (b) asserts a claim or counterclaim in the courts or before the applicable governmental agency *(e.g.*, the United States Patent Trial and Appeal Board) seeking to attack, invalidate or render unenforceable any claim within the PATENT RIGHTS; or (c) assists a third party with either or both (a) or (b) (each of (a), (b), or (c) being a "CHALLENGE EVENT"), then LICENSEE shall provide at least [***] days written notice to UNIVERSITY prior to initiating such a CHALLENGE EVENT, along with a copy of any prior art which forms the basis for the CHALLENGE EVENT and a claim-by-claim detailed analysis of patent invalidity and/or unenforceability. Upon the occurrence of a CHALLENGE EVENT, UNIVERSITY, shall have the right, but not the obligation,

to terminate this AGREEMENT with respect to such LICENSEE and/or SUBLICENSEE by providing written notice of the same. In the event that UNIVERSITY elects not to terminate this AGREEMENT, then all payments due under Article III by LICENSEE or SUBLICNESEE as applicable shall [***]. Moreover, should the outcome of any such action or proceeding be unsuccessful, then LICENSEE and/or SUBLICENSEE challenging such claim shall pay (i) [***] all payments after the pendency of the aforementioned action and (ii) UNIVERSITY' s costs, expenses, and reasonable attorneys' fees incurred in such action. An action or proceeding shall be deemed "unsuccessful" for purposes of this Section 3.09 if: 1) the proceeding or lawsuit is terminated for any reason prior to a settlement or judgment from which no appeal can be or is taken; 2) one or more of the claims within the PATENT RIGHTS challenged by said lawsuit remain valid and enforceable after any such settlement or judgment is in effect; or 3) if LICENSEE would still require a license to any of the PATENT RIGHTS to sell any of its products after any such settlement or judgment is in effect. Any such judicial challenge by LICENSEE or SUBLICENSEE shall be brought in the courts of Missouri, and LICENSEE and SUBLICNESEE agree not to challenge personal jurisdiction in that forum. LICENSEE shall not be relieved from any payments that accrue before any decision invalidating a claim within the PATENT RIGHTS or a claim not involved in such decision. LICENSEE and SUBLICENSEE shall have no right to recoup any such payments paid before or during the period of challenge.

Article IV. REPORTING

Section 4.01 Commercialization Plan. Prior to signing this AGREEMENT, LICENSEE has provided to UNIVERSITY a written plan (hereinafter "COMMERCIALIZATION PLAN") for the LICENSED PRODUCT within the respective LICENSED FIELD and within the respective country or countries of the LICENSED TERRITORY to be introduced by LICENSEE into commercial use. The COMMERCIALIZATION PLAN shall include, without limitation: (a) planned research and development activities and (b) milestones and evidence of sufficient financial resources to successfully implement the COMMERCIALIZATION PLAN and ensure that LICENSED PRODUCT will be kept reasonably available to the public. Projections of sales and proposed marketing efforts. Such COMMERCIALIZATION PLAN is incorporated as Appendix B. Sales projections and proposed marketing efforts for LICENSED PRODUCTS will be added to an updated version of the COMMERCIALIZATION PLAN within [***] days of the completion of the first field trial for each LICENSED PRODUCT.

Section 4.02 First Sale. LICENSEE shall report to UNIVERSITY the date of first SALE of LICENSED PRODUCTS in each country of LICENSED TERRITORY within [***] days of occurrence. An exemplary report is set forth as Appendix C.

Section 4.03 Reporting. Within [***] days after each ROYALTY PERIOD following the first SALE of LICENSED PRODUCT, whether SOLD by LICENSEE or its SUBLICENSEE(s), if any exists,

LICENSEE must deliver to UNIVERSITY a true and accurate written report, even if no payments are due UNIVERSITY, giving the particulars of the business conducted by LICENSEE and its SUBLICENSEE(s) during the ROYALTY PERIOD as are pertinent to calculating payments hereunder. This report will include at least:

(a) the quantities of LICENSED PRODUCT produced or manufactured;

(b) the total NET SALES, including any deductions applicable as provided in Section 1.07;

(c) the exchange rate used;

(d) the offsets of minimum annual royalties or other offsets allowed under this AGREEMENT;

(e) the method used to calculate the royalties thereon;

(f) the total SALES ROYALTY computed and due UNIVERSITY, including a reference to the data source for determining if a particular LICENSED PRODUCT is designated a NICHE CROP or COMMODITY CROP;

(g) the royalties due UNIVERSITY on additional payments from SUBLICENSEE(s) under Section 3.02; and

(h) the names and addresses of all SUBLICENSEE (s) of LICENSEE.

If no payment is due, LICENSEE shall so report to UNIVERSITY. An exemplary report format is set forth in Appendix D. This report shall identify the issued patents and/or patent applications under PATENT RIGHTS that cover the particular LICENSED PRODUCT being reported. LICENSEE shall direct its authorized representative to certify that reports required hereunder are correct to the best of LICENSEE's knowledge and information. Failure to provide reports as required under this Article shall be a material breach of this AGREEMENT.

LICENSEE shall provide sufficient data for UNIVERSITY to verify the royalty calculations and any reasonable additional information UNIVERSITY requires to determine LICENSEE's satisfaction of the reporting requirements hereunder or to clarify the information contained in reports provided by LICENSEE. LICENSEE shall provide such additional information to UNIVERSITY within [***] days of receiving a request from UNIVERSITY. Simultaneously with the delivery of each report, LICENSEE must pay to UNIVERSITY the amount, if any, due for the period of each report.

Section 4.04 Annual Commercialization Report. On or before each anniversary of the EFFECTIVE DATE, irrespective of having a first SALE or offer for SALE, LICENSEE must deliver to UNIVERSITY a written annual report as to LICENSEE's (and any SUBLICENSEE's) efforts

and accomplishments during the preceding year in diligently commercializing LICENSED PRODUCT in the LICENSED FIELD, including but not limited to,

(a) research and development expenditures and progress,

(b) regulatory filings and approvals,

(c) manufacturing,

(d) sublicensing activities,

(e) marketing and sales,

(f) jobs created,

(g) capital raised and source of funding,

(h) LICENSEE's (and, if applicable, SUBLICENSEE's) commercialization plans for the upcoming year.

LICENSEE shall also promptly provide any reasonable additional information UNIVERSITY requested to evaluate LICENSEE'S performance under this AGREEMENT.

Section 4.05 Records. LICENSEE shall keep full, true and accurate books of account containing all particulars that may be necessary for the purpose of showing the amounts payable to UNIVERSITY. The books of account shall be kept at LICENSEE's principal place of business or the principal place of business of the appropriate division of LICENSEE to which this AGREEMENT relates. The books, ledgers, records, and the supporting data shall be open at all reasonable times for [***] years following the end of the calendar year to which they pertain, for the inspection by UNIVERSITY or its representatives for the purpose of verifying LICENSEE's royalty statements or compliance in other respects with this AGREEMENT. If the amounts due to UNIVERSITY are determined to have been underpaid, LICENSEE will pay the amount of such underpayment and interest on the amount of such underpayment with interest accumulating at the rate as set forth in Section 3.06 accruing from the date such payment was originally due to UNIVERSITY. Should such inspection lead to the discovery of a greater than [***] percent ([***]%) discrepancy or more in reporting to UNIVERSITY's detriment, LICENSEE agrees to pay the full cost of such inspection and audit.

Article V. DUE DILIGENCE

Section 5.01 LICENSEE shall use reasonable efforts to effect introduction of the LICENSED PRODUCT into the commercial market as soon as practicable, consistent with sound and reasonable business practices and judgment thereafter, until the expiration or termination of this AGREEMENT, LICENSEE shall keep LICENSED PRODUCT reasonably available to the public.

Section 5.02 UNIVERSITY shall have the right, at UNIVERSITY's sole discretion, to either terminate or render this license nonexclusive in an individual LICENSED FIELD and/or individual country or countries within the LICENSED TERRITORY if LICENSEE or its SUBLICENSEE(s) (if applicable):

(a) Has not within [***] months of the EFFECTIVE DATE presented to and obtained UNIVERSITY's approval, which approval shall not be unreasonably withheld, a revised and updated COMMERCIALIZATION PLAN for LICENSED PRODUCT within the respective LICENSED FIELD and within the respective country or countries of the LICENSED TERRITORY not previously introduced by LICENSEE into commercial use taking into account the different timelines and regulatory hurdles for both NICHE CROP and COMMODITY CROP LICENSED PRODUCT market opportunities, and the genetic engineering methods to be used in each NICHE CROP and COMMODITY CROP LICENSED PRODUCT and its implications for timelines and costs for regulatory approval for commercial use, or

(b) Has not within [***] years of the EFFECTIVE DATE created [***] for regulatory approval of at least one LICENSED PRODUCT which is an oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower, or

(c) Has not within [***] years of the EFFECTIVE DATE completed at least one multi-site field demonstration for a LICENSED PRODUCT which is an oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower, or

(d) Has not within [***] years of the EFFECTIVE DATE filed for a first regulatory approval of a LICENSED PRODUCT which is an oilseed crop species selected from canola, soybean, rapeseed, camelina, or safflower.

Article VI. INDEMNITY, INSURANCE, WARRANTIES, DAMAGES

Section 6.01 Indemnity. LICENSEE shall, and will require SUBLICENSEES to, at all times during the term of this AGREEMENT and thereafter, indemnify, defend and hold UNIVERSITY, its current or former Curators, officers, employees and affiliates, harmless from any claim, proceeding, suit, demand, expense, loss, penalty, judgment, or liability of any kind whatsoever, including costs, expenses and reasonable attorneys' fees, resulting from, related to, arising out of, or in connection with (a) the design, development, production, manufacture, shipping, use, performance, importation, SALE, advertisement, labeling, promotion, or patent marking of the LICENSED PRODUCT by LICENSEE or its SUBLICENSEES, or end users, including but not limited to (i) any infringement or misappropriation of a patent, copyright, trade secret or other intellectual property or proprietary right of any third party or (ii) any product liability claims, such as those involving the death of or injury to any person or persons or damage to property; or (b) any breach of any obligation, covenant, representation, or warranty by LICENSEE or its SUBLICENSEES hereunder; or (c) the production, use or SALE of any product, process or service identified, characterized or otherwise developed

with the aid of the PATENT RIGHTS by LICENSEE or its SUBLICENSEES; or (d) a breach or violation of applicable law by LICENSEE, or its SUBLICENSEES; or (e) the exercise of LICENSEE's rights under this AGREEMENT. If any such claims or causes of action are made, UNIVERSITY shall be defended by counsel selected by LICENSEE, subject to UNIVERSITY's approval, which shall not be unreasonably withheld. UNIVERSITY reserves the right to be represented by its own counsel at its own expense.

Section 6.02 Insurance. At such time as any LICENSED PRODUCT is being commercially SOLD (other than for the purpose of obtaining [***]) by LICENSEE, a SUBLICENSEE, or a subsidiary or agent of LICENSEE, LICENSEE shall at its sole cost and expense, procure and maintain commercial general liability insurance in amounts not less than [***] dollars ($[***]) per incident and naming UNIVERSITY, its Curators, trustees, officers, agents, employees and affiliates, as additional insureds. Such commercial general liability insurance shall provide (a) product liability coverage and (b) broad form contractual liability coverage for LICENSEE's indemnification under this AGREEMENT. Such insurance will be considered primary as to any other valid and collectible insurance, but only as to acts of the named insured. Any carrier providing coverage shall have a minimum "Best" rating of "A-XII". The minimum amounts of insurance coverage required shall not be construed to create a limit of LICENSEE's liability with respect to its indemnification under this AGREEMENT.

LICENSEE shall maintain such commercial general liability insurance beyond the expiration or termination of this AGREEMENT during (i) the period that any product, process, or service, relating to, or developed pursuant to this AGREEMENT is being commercially SOLD by LICENSEE or its SUBLICENSEE and (ii) a reasonable period after the period referred to in (i) above which in no event shall be less than [***] years.

LICENSEE shall provide Workers' Compensation coverage for any employee of LICENSEE that visits UNIVERSITY premises for matters relating to this AGREEMENT. In addition, Employers' Liability coverage shall be provided to such employee in an amount no less than [***] dollars ($[***]) per occurrence.

LICENSEE shall provide UNIVERSITY with written evidence of the insurance requirements of this Section 6.02 within [***] days after such insurance becomes necessary pursuant to this AGREEMENT. LICENSEE shall provide UNIVERSITY with written notice at least [***] days prior to the cancellation, non-renewal or material change in such insurance; if LICENSEE does not obtain replacement insurance providing comparable coverage within such [***] day period, UNIVERSITY shall have the right to terminate this AGREEMENT effective at the end of such [***] day period without notice or any additional waiting periods. It is agreed that the insurance required is required in the public interest and UNIVERSITY does not assume any liability for acts

of LICENSEE, their officers, agents, and employees or a SUBLICENSEE, their officers, agents, and employees, in connection with the granting of this AGREEMENT.

If LICENSEE elects to self-insure all or part of the limits described above, such self-insurance program must be acceptable to UNIVERSITY's Risk and Insurance Management department.

Section 6.03 Disclaimer of Warranties. THE PATENT RIGHTS ARE DELIVERED "AS IS" IN EVERY RESPECT. UNIVERSITY, ITS CURRENT OR FORMER CURATORS, OFFICERS, EMPLOYEES, AND AFFILIATES MAKE NO REPRESENTATIONS AND EXTEND NO WARRANTIES OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTIES OF COMMERCIAL UTILITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, THE ABSENCE OF LATENT OR OTHER DEFECTS, WHETHER OR NOT DISCOVERABLE, THE SCOPE, VALIDITY OR ENFORCEABILITY OF THE PATENT RIGHTS, WHETHER ISSUED OR PENDING, OR THAT THE MANUFACTURE, USE, IMPORTATION OR SALE OF THE LICENSED PRODUCT OR THAT THE PRACTICE OF THE PATENT RIGHTS WILL NOT INFRINGE OR MISAPPROPRIATE ANY PATENT, COPYRIGHT, TRADEMARK, OR OTHER RIGHTS OF ANY THIRD PARTY.

Section 6.04 Damages Exclusion / Limitation of Remedies. IN NO EVENT SHALL UNIVERSITY ITS CURRENT OR FORMER CURATORS, OFFICERS, EMPLOYEES, AND AFFILIATES BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES OF ANY KIND, REGARDLESS OF THE FORM OF ACTION, WHETHER IN CONTRACT OR IN TORT, INCLUDING NEGLIGENCE OR OTHERWISE, AND INCLUDING ECONOMIC DAMAGE OR INJURY TO PROPERTY AND LOST PROFITS, ATTORNEYS' AND EXPERTS' FEES, REGARDLESS OF WHETHER UNIVERSITY MAY BE ADVISED, MAY HAVE OTHER REASON TO KNOW, OR IN FACT SHALL KNOW OF THE POSSIBILITY.

Section 6.05 For the avoidance of doubt, nothing in this AGREEMENT shall be construed as:

(a) a warranty or representation by UNIVERSITY as to the validity or scope of any PATENT RIGHTS;

(b) a warranty or representation by UNIVERSITY that anything made, used, imported, SOLD or otherwise disposed of pursuant to any license granted under this AGREEMENT is or will be free from infringement of intellectual property rights of third parties;

(c) an obligation by UNIVERSITY to bring or prosecute actions or suits against third parties for patent infringement;

(d) an obligation to furnish any know-how not provided in the PATENT RIGHTS; or

(e) conferring by implication, estoppel or otherwise any license or rights under any patents of UNIVERSITY other than PATENT RIGHTS, regardless of whether such patents are dominant or subordinate to the PATENT RIGHTS.

Section 6.06 Sublicenses. LICENSEE shall require in any sublicense in which LICENSEE grants to a third party the right to make, have made, use, import, offer to SELL or SELL any LICENSED PRODUCT, provisions that provide UNIVERSITY, its Curators, trustees, officers, agents, employees and affiliates, comparable protections as those provided UNIVERSITY in this Article VI. LICENSEE shall not, and shall require that its SUBLICENSEES do not, make any statements, representations or warranties whatsoever to any person or entity, or accept any liabilities or responsibilities whatsoever from any person or entity that are inconsistent with any disclaimer of warranties or damages exclusion / limitation of remedies included in this Article VI.

Article VII. DOMESTIC AND FOREIGN PATENT FILING AND MAINTENANCE

Section 7.01 Ownership and Control of Patents. UNIVERSITY shall have full, complete and sole ownership of any pending applications and issued patents included in PATENT RIGHTS. UNIVERSITY shall be responsible for the preparation, filing, prosecution and maintenance of the patent applications and issued patents included in the PATENT RIGHTS. UNIVERSITY, either directly or through its attorneys at UNIVERSITY's option, shall first consult with LICENSEE or its attorneys as to the preparation, filing, prosecution, and maintenance of such patent applications and issued patents and shall furnish to LICENSEE or its attorneys copies of significant documents it receives relevant to any such preparation, filing, prosecution or maintenance. LICENSEE shall cooperate with UNIVERSITY in such preparation, filing, prosecution, and maintenance. LICENSEE agrees to hold such information confidential and to use the information provided by UNIVERSITY only for the purpose of advancing the PATENT RIGHTS and shall return all such information to UNIVERSITY upon termination of LICENSEE's rights in any particular patent application or issued patent under Section 7.05 or upon termination or expiration of this AGREEMENT.

Section 7.02 Common Legal Interest.

(a) Existence of a Common Legal Interest. UNIVERSITY and LICENSEE confirm that they have had and continue to have a common legal interest in preparation, filing, prosecution and maintenance of the patent applications and issued patents included in the PATENT RIGHTS, an including any infringement/validity litigation arising therefrom (the "COMMON INTEREST").

(b) Common Interest Information. UNIVERSITY and LICENSEE agree that "COMMON INTEREST INFORMATION" shall mean any and all information shared between UNIVERSITY and LICENSEE, or their counsel, to advance their common interest and/or relating in any way to the COMMON INTEREST, including, but not limited to, information exchanged through oral, written, electronic or other means, documents, prior art, factual material, mental impressions, strategies, legal theories and analysis, memoranda, expert analysis and opinions, interviews and interview reports, witness statements and other information, analysis and conclusions belonging to either or both PARTIES and communications between the PARTIES and their counsel.

(c) Application of Privilege. UNIVERSITY and LICENSEE intend this Section 7.02 shall enable them, to the fullest extent permitted by law, to share COMMON INTEREST INFORMATION while preserving their common interest privilege, joint defense privilege, attorney-client privilege, litigation privilege, attorney work product protection or any other related or applicable privilege or protection, or other exemptions from disclosure that might attach thereto.

(d) Use, Confidentiality and Marking.

(i) Each PARTY agrees that the COMMON INTEREST INFORMATION it receives from the other PARTY or developed jointly shall be only used for the purpose of the COMMON INTEREST.

(ii) At all times, any COMMON INTEREST INFORMATION disclosed by UNIVERSITY and LICENSEE or any of their counsel shall be maintained in confidence by the other PARTY and their counsel unless and until permission is given in writing by the disclosing PARTY or except as provided in Section 7.02(e).

(iii) UNIVERSITY and LICENSEE may in their discretion label as "COMMON INTEREST INFORMATION" materials exchanged pursuant to this AGREEMENT. However, failure to so mark or label any material shall neither exclude that material from the scope of COMMON INTEREST INFORMATION nor constitute a waiver of any privilege or a waiver of any right or obligation created by this AGREEMENT.

(e) Third Party Requests. If any third party requests or demands any COMMON INTEREST INFORMATION from LICENSEE, LICENSEE will immediately notify the UNIVERSITY. All necessary steps will be taken by the LICENSEE to whom the request is made to permit the assertion of all applicable rights, privileges, doctrines and rules of protection with regard to the COMMON INTEREST INFORMATION. Without limiting the foregoing, upon receipt by a LICENSEE of a summons, subpoena, or open records request requesting access to, or production of COMMON INTEREST MATERIALS provided by UNIVERSITY, LICENSEE shall immediately: (i) notify the UNIVERSITY and provide not less than [***] business days notice before production; (ii) take all necessary steps to defend against and resist the request; and (iii) cooperate with UNIVERSITY in defending against and resisting this request. LICENSEE agrees to inform the person or entity seeking the COMMON INTEREST INFORMATION that such materials are privileged and may not be disclosed unless so ordered by the court. LICENSEE shall not be deemed to be in breach of this AGREEMENT if that LICENSEE communicates information because compelled to do so by law or a court of competent jurisdiction.

(f) Effect of Termination or Expiration on Common Interest Information. Upon termination or expiration of this AGREEMENT, any COMMON INTEREST INFORMATION made available by either UNIVERSITY or LICENSEE prior such termination or expiration shall continue to be governed by the terms of this AGREEMENT. Further, the PARTY shall return or destroy all COMMON INTEREST INFORMATION received from the other PARTY in its possession that is fixed in a tangible form of expression to the other PARTY within [***] days of any request from the other PARTY.

(g) Disqualification. This Section 7.02 is not intended nor shall it be deemed to affect the independent and separate representation of a PARTY by its counsel. Further, this AGREEMENT shall not affect the ethical, fiduciary, or other obligations inherent in those attorney-client relationship other than to extend the cloak of confidentiality and privilege to the COMMON INTEREST INFORMATION. Neither the existence of this AGREEMENT nor the exchange of COMMON INTEREST INFORMATION pursuant to it, or any claim which may arise between the PARTIES in connection with the PATENT RIGHTS shall be used as a basis for a claim that any counsel to either UNIVERSITY or LICENSEE is disqualified from representing such PARTY.

(h) Memorialization. Prior to execution of this AGREEMENT, the PARTIES may have shared information or materials with one another that would be considered COMMON INTEREST INFORMATION. The PARTIES hereby state their intention and belief, and they hereby agree that such information is subject to the same legal privileges and protections as though it had been shared after the execution of this AGREEMENT. Without limiting the foregoing, this AGREEMENT memorializes an understanding between the PARTIES that has existed since before the PARTIES shared any COMMON INTEREST INFORMATION in connection with the PATENT RIGHTS and the terms of this AGREEMENT apply to any COMMON INTEREST INFORMATION that was shared between the PARTIES and/or their counsel before the EFFECTIVE DATE.

Section 7.03 Patent Expenses. LICENSEE shall reimburse UNIVERSITY for all PATENT EXPENSES as a separate payment apart from any royalties or other revenues owed UNIVERSITY. For PATENT EXPENSES incurred prior to the EFFECTIVE DATE, such reimbursement by LICENSEE shall be due and payable when this agreement is fully executed. For all future PATENT EXPENSES incurred after the EFFECTIVE DATE, reimbursements by LICENSEE shall be due within [***] days of receipt of UNIVERSITY's invoice by LICENSEE, and shall be non-refundable and non-creditable. Late payment of invoices of PATENT EXPENSES received by LICENSEE from UNIVERSITY shall be subject to interest charges of [***] percent ([***]%) per [***].

Section 7.04 Entity Status. LICENSEE shall have a continuing obligation to keep UNIVERSITY and its patent counsel responsible for the PATENT RIGHTS informed of the entity status (large entity, small entity, and micro entity) of LICENSEE and all its SUBLICENSEES. LICENSEE agrees to give UNIVERSITY prompt notice of a change in any entity status of it or any SUBLICENSEES. A statement or future statement by LICENSEE and/or its SUBLICENSEES as to its entity status constitutes a representation that is subject to indemnity under Section 6.01.

Section 7.05 Termination of Patent Rights. By written notification to UNIVERSITY at least [***] days in advance of any filing or response deadline or fee due date (i.e., a date by which an action must be taken to avoid payment of a late fee), LICENSEE may elect not to have a particular patent application filed in a particular country or not to pay expenses associated with prosecuting or maintaining any particular patent application or issued patent, provided that LICENSEE pays for all PATENT EXPENSES associated with the particular patent application or issued patent incurred

up to UNIVERSITY's receipt of such notification. LICENSEE's failure to provide a timely notification shall be considered by UNIVERSITY to be LICENSEE's consent that it expressly wishes to support any particular issued patent(s) or patent application(s). Upon notice that LICENSEE elects not to have a particular patent application filed or prosecuted or issued patent maintained in any particular country, or not to reimburse UNIVERSITY for all PATENT EXPENSES associated with prosecuting or maintaining any patent application or patent, UNIVERSITY may at its sole discretion elect to file, prosecute, and/or maintain such particular patent applications or issued patents at its own expense and for its own benefit, and any rights or license granted under this AGREEMENT held by LICENSEE or SUBLICENSEE(s) with respect to such patent application(s) or issued patent(s) shall be irrevocably terminated, forfeited, and relinquished. For the avoidance of doubt, LICENSEE and each SUBLICENSEE shall have no right to share in any revenue derived from such particular patent application or issued patents.

Article VIII. INFRINGEMENT OF PATENT RIGHTS

Section 8.01 Notifications. LICENSEE shall promptly inform UNIVERSITY in writing of any alleged infringement of the PATENT RIGHTS by a third party and shall provide UNIVERSITY with any available evidence thereof. LICENSEE shall not notify a third party of such infringement of PATENT RIGHTS without first consulting with UNIVERSITY.

Section 8.02 Enforcement. For so long as the license granted herein is exclusive, LICENSEE, at its expense, shall have the right to enforce PATENT RIGHTS against infringement by third parties. All recovery from such enforcement, including any cash or other consideration received by way of judgment, settlement or compromise (hereinafter "RECOVERY") less direct out-of-pocket legal expenses incurred by LICENSEE for such enforcement, shall be considered NET SALES and LICENSEE shall pay UNIVERSITY a SALES ROYALTY on such NET SALES. Before LICENSEE commences a formal legal proceeding with respect to any infringement of PATENT RIGHTS, LICENSEE shall first consult with UNIVERSITY regarding the potential effects such legal proceeding may have on the public interest. UNIVERSITY shall have the right, in its sole discretion, to join such proceeding at its own expense. In the event that UNIVERSITY is involuntarily joined as a party to an infringement action brought by LICENSEE (including any counterclaim), then LICENSEE shall pay any costs, expenses, and attorneys' fees incurred by UNIVERSITY arising out of, relating to, or in connection therewith. In addition, LICENSEE agrees to consult with UNIVERSITY on any significant matters related to the litigation. LICENSEE shall be free to enter into a settlement, consent judgment, or other voluntary disposition with respect to any such action, provided that any settlement, consent judgment or other voluntary disposition thereof which (a) materially limits the scope, validity, or enforceability of patents included in the PATENT RIGHTS or (b) admits fault or wrongdoing on the part of UNIVERSITY or (c) impose a financial or other obligation upon the UNIVERSITY, must in the case of (a), (b) or (c) be pre-approved in writing by UNIVERSITY. LICENSEE shall keep UNIVERSITY informed on all actions taken by LICENSEE in its enforcement against an infringer and shall furnish to UNIVERSITY

copies of all documents related thereto. LICENSEE shall indemnify, defend, and hold harmless UNIVERSITY against any order for costs or fees that may be made against UNIVERSITY in such proceeding arising from, related to, or in connection with an act or omission made by LICENSEE.

Section 8.03 Rights of University. In the event that LICENSEE elects not to exercise its right to bring an infringement action with respect to PATENT RIGHTS pursuant to the above paragraphs, then LICENSEE shall notify UNIVERSITY in writing within [***] months of receiving notice that an infringement exists. UNIVERSITY may, at its own expense and control, following the earlier of (a) such notice from LICENSEE or (b) the expiration of such [***] month period without LICENSEE electing to take any action with respect to such alleged or actual infringement, take steps to defend or enforce any patent within the PATENT RIGHTS and retain all RECOVERY therefrom without a duty to account to LICENSEE. LICENSEE agrees to cooperate reasonably with UNIVERSITY in any validity or infringement suit or dispute involving the PATENT RIGHTS.

Article IX. CONFIDENTIALITY

Section 9.01 Confidential Information Defined. "CONFIDENTIAL INFORMATION" means any and all information not generally known to the public, whether or not patentable or susceptible to any other form of legal protection, that is identified or designated by UNIVERSITY as being confidential or which, in light of the circumstances under which it was disclosed, whether oral or written, is reasonably apparent to LICENSEE to be considered confidential or proprietary by UNIVERSITY, including but not limited to invention disclosures, non-public patent prosecution information, including but not limited to concepts, designs, processes, specifications, schematics, equipment, processing, techniques, technical information, drawings, diagrams, software (including source code), hardware, control systems, research, test results, manuals, trade secrets, commercialization studies, market studies, business plans received by LICENSEE from UNIVERSITY except to the extent LICENSEE can prove by written documentation that such information:

(a) was in the public domain at the time of disclosure;

(b) later became part of the public domain through no act or omission or breach of this AGREEMENT by LICENSEE, its employees, agents, successors or assigns;

(c) was lawfully disclosed to LICENSEE by a third party having the right to make such disclosure; or

(d) was already known by LICENSEE at the time of disclosure; or

(e) was independently developed by LICENSEE without the aid, use or application of CONFIDENTIAL INFORMATION received from UNIVERSITY and such independent development can be properly demonstrated by LICENSEE; or

(f) is otherwise required by law or regulation to be disclosed.

Specific information shall not be deemed to be within the foregoing exceptions merely because it is embraced by more general information within the exceptions. In addition, any combination of the features shall not be deemed to be within the foregoing exception merely because individual features may be within the exceptions.

Section 9.02 Restrictions on Disclosure and Use. LICENSEE agrees that (a) all CONFIDENTIAL INFORMATION shall remain the exclusive property of UNIVERSITY, (b) LICENSEE shall receive and hold the CONFIDENTIAL INFORMATION in strict confidence, (c) LICENSEE shall use the CONFIDENTIAL INFORMATION only for the purposes of this AGREEMENT, and (d) LICENSEE shall not disclose the CONFIDENTIAL INFORMATION to third parties without the prior written consent of UNIVERSITY, and (e) LICENSEE shall protect the CONFIDENTIAL INFORMATION to the same extent that it protects its own trade secrets and confidential information, but in no less than commercially reasonable care.

Section 9.03 Legally required Disclosures. In the event that LICENSEE receives a request or is required by deposition, interrogatory, request for documents, subpoena, civil investigative demand, or similar process to disclose any or part or the CONFIDENTIAL INFORMATION, LICENSEE agrees to (a) immediately notify UNIVERSITY in writing of the existence, terms, and circumstances surrounding such a request or requirement and (b) assist UNIVERSITY in seeking a protective order or other appropriate remedy satisfactory to UNIVERSITY. In the event that such a protective order or other remedy is not obtained, (i) LICENSEE may disclose that portion of the CONFIDENTIAL INFORMATION which it is legally required to disclose, (ii) LICENSEE and shall exercise reasonable efforts to obtain assurance that confidential treatment will be accorded the CONFIDENTIAL INFORMATION to be disclosed and (iii) LICENSEE shall give written notice to UNIVERSITY of the information to be disclosed as far in advance of its disclosure as practical. LICENSEE may also disclose CONFIDENTIAL INFORMATION to governmental or other regulatory agencies in order to obtain approvals to market any LICENSED PRODUCT, but such disclosure may only be to the extent reasonable necessary to obtain approvals.

Section 9.04 Disclosure to Potential Sublicensee or Assignee. Upon receiving written approval from UNIVERSITY, LICENSEE may disclose the CONFIDENTIAL INFORMATION to a potential SUBLICENSEE or assignee of LICENSEE in each case on the condition that such potential SUBLICENSEE or assignee agrees to be bound by the confidentiality obligations contained in this AGREEMENT.

Section 9.05 Sunshine Law. LICENSEE acknowledges that UNIVERSITY is subject to the Missouri Sunshine Act, 610 RSMo, and that all agreements, plans, reports, and other information marked "Confidential" shall be treated by UNIVERSITY as confidential only to the extent permitted by law.

Section 9.06 Survival. LICENSEE's obligations of confidentiality and non-use shall exist during the term of this AGREEMENT and for so long as such CONFIDENTIAL INFORMATION remains confidential in accordance with Section 9.01.

Article X. TERM AND TERMINATION

Section 10.01 Term. This AGREEMENT shall become effective upon the EFFECTIVE DATE and, unless sooner terminated in accordance with any of the provisions herein, shall remain in full force in the LICENSED TERRITORY until the expiration of the last to expire patent or last to be abandoned patent application included in the PATENT RIGHTS.

Section 10.02 Right to Terminate by Licensee. LICENSEE shall have the right to terminate this AGREEMENT at any time on ninety (90) days notice to UNIVERSITY.

Section 10.03 Breach. In the event that either PARTY defaults or breaches any of the provisions of this AGREEMENT, the other PARTY shall have the right to terminate this AGREEMENT by giving written notice to the defaulting PARTY; provided, however, that if the defaulting PARTY cures the default within thirty (30) days after the notice shall have been given, this AGREEMENT shall continue in full force and effect. The failure on the part of either of the PARTIES hereto to exercise or enforce any right conferred upon it hereunder shall not be deemed to be a waiver of any such right nor operate to bar the exercise or enforcement thereof at any time or times thereafter. In relation to Article III (payments) and Section 7.03 (patent expenses), LICENSEE's opportunity to cure a breach shall apply only to LICENSEE's first two notices of a breach properly given by UNIVERSITY. Upon occurrence of a third breach, UNIVERSITY may, at its option, terminate this AGREEMENT upon [***] days written notice without an opportunity to cure.

Section 10.04 Rights after Termination. Upon termination for any reason, LICENSEE shall:

(a) promptly pay all amounts due UNIVERSITY through the effective date of the termination (even if they would otherwise be payable at a later date, e.g. within [***] days after invoicing), including those in Article III (payments) and Section 7.03 (patent expenses);

(b) submit all final reports under Article IV;

(c) return any CONFIDENTIAL INFORMATION provided to LICENSEE by UNIVERSITY in connection with this AGREEMENT, or, with UNIVERSITY's prior approval, destroy such materials, and LICENSEE shall certify in writing that such materials have all been returned or destroyed;

(d) provide UNIVERSITY a copy of any regulatory data or information filed with any U.S. or foreign government agency with respect to the LICENSED PRODUCT; and

(e) shall refrain, and shall require its SUBLICENSEE to refrain unless such sublicense is assigned to UNIVERSITY under Section 10.05, from any further SALES or other commercial exploitation of the LICENSED PRODUCT except as provided in Section 10.09.

Nothing in this section shall be construed as limiting in any way UNIVERSITY'S rights or remedies that UNIVERSITY may otherwise have, either in law or in equity.

Section 10.05 Assignment of Sublicenses. Upon termination of this AGREEMENT, LICENSEE's interest in sublicenses granted by it under this AGREEMENT shall at UNIVERSITY's sole option, terminate or be assigned to UNIVERSITY, including the right to receive income from SUBLICENSEES. LICENSEE shall make provision for UNIVERSITY's rights under the preceding sentence to be included in all sublicenses granted by it under this AGREEMENT.

Section 10.06 Insolvency. In the event that LICENSEE (or SUBLICENSEE as applicable) dissolves, liquidates, ceases to carry on business, becomes insolvent, is unable to pay its debts as they become due, makes an assignment for the benefit of creditors, or has a petition for bankruptcy filed for or against it, this AGREEMENT (or applicable sublicense) shall automatically terminate.

Section 10.07 Upon termination (but not expiration) of this AGREEMENT by LICENSEE and provided LICENSEE has the legal right to do so, LICENSEE hereby grants to UNIVERSITY a nonexclusive, royalty-free, irrevocable, paid-up license, with the right to grant sublicenses to any IMPROVEMENTS and any intellectual property therein throughout the world, including without limitation, any and all United States and foreign patents and patent applications, industrial design, plant variety, copyrights, or other intellectual property rights relating to the IMPROVEMENTS for use in combination with the PATENT RIGHTS licensed herein.

Section 10.08 Survival. Termination of this AGREEMENT for any reason shall not release either PARTY from any obligation theretofore accrued. All provisions of this AGREEMENT that would reasonably be expected to survive the termination or expiration of this AGREEMENT shall do so, including Article III (all--payments), Article VI (all—indemnity, insurance, warranties, damages), Article IX (all--confidentiality), Section 2.04 (reserved rights), Section 2.05 (license to University), Section 2.08 (governmental rights), Section 3.09 (challenge to patent rights), Section 4.03 (reporting), Section 4.05 (records), Section 7.02(f) (effect of termination or expiration on common interest information); Section 10.04(rights after termination), Section 10.05 (assignment of sublicenses), Section 10.07 (assignment of improvements to University), Section 10.09 (inventory), Section 10.10 (ongoing payments), and Article XI (general—all) survive the termination of this AGREEMENT.

Section 10.09 Inventory. Upon termination of this AGREEMENT or upon termination in whole or in part through no fault of LICENSEE, LICENSEE shall provide UNIVERSITY with a written inventory of all LICENSED PRODUCTS in the possession or under the control of LICENSEE (including any in the process of manufacture). Except with respect to termination for uncured breach by LICENSEE, LICENSEE shall have the privilege of SELLING the inventory of such LICENSED PRODUCTS within a period of [***] days of such termination upon conditions most favorable to UNIVERSITY that LICENSEE can commercially reasonably obtain and paying any applicable royalties associated with such SALES to UNIVERSITY.

Section 10.10 Ongoing Payments. Any termination or cancellation under any provision of this AGREEMENT shall not relieve LICENSEE of its obligation to pay any royalty or other fees due to UNIVERSITY at the time of such termination or cancellation.

Article XI. GENERAL

Section 11.01 Marking. Prior to the issuance of patents under PATENT RIGHTS, LICENSEE agrees to mark LICENSED PRODUCTS (or their containers or labels) SOLD by LICENSEE or SUBLICENSEES under the license granted in this AGREEMENT with the words "Patent Pending" and following the issuance of one or more patents under PATENT RIGHTS, with the words "Patent No. __"or in such a manner as to conform with the patent laws and

practice of the country of manufacture, SALE, or importation.

Section 11.02 Compliance with Laws; Export Controls. LICENSEE agrees to comply with all applicable federal, state, and local laws and regulations. In particular, LICENSEE shall comply with all applicable U.S. laws dealing with the export and/or management of commodities, technology or information, and that LICENSEE will be responsible for any violation of such by LICENSEE or its SUBLICENSEES, and that it will defend and hold UNIVERSITY harmless in the event of any legal action of any nature occasioned by such violation. LICENSEE understands that the Arms Export Control Act (AECA), including its implementing International Traffic In Arms Regulations (ITAR,) and the Export Administration Act (EAA), including its Export Administration Regulations (EAR), are some (but not all) of the laws and regulations that comprise the U.S. export laws and regulations. LICENSEE further understands that the U.S. export laws and regulations include (but are not limited to): (a) ITAR and EAR product/service/data-specific requirements; (b) ITAR and EAR ultimate destination-specific requirements; (c) ITAR and EAR end user-specific requirements; (d) ITAR and EAR end use-specific requirements; (e) Foreign Corrupt Practices Act; and (f) anti-boycott laws and regulations. LICENSEE will comply with all then-current applicable export laws and regulations of the U.S. Government (and other applicable U.S. laws and regulations) pertaining to the LICENSED PRODUCTS (including any associated products, items, articles, computer software, media, services, technical data, and other information). LICENSEE warrants that it will

not, directly or indirectly, export (including any deemed export), nor re-export (including any deemed re-export) the LICENSED PRODUCT (including any associated products, items, articles, computer software, media, services, technical data, and other information) in violation of U.S. export laws and regulations or other applicable U.S. laws and regulations. LICENSEE will include an appropriate provision in its agreements with its authorized SUBLICENSEES to assure that these parties comply with all then-current applicable U.S. export laws and regulations and other applicable U.S. laws and regulations. LICENSEE'S OBLIGATIONS TO COMPLY WITH U.S. EXPORT CONTROL LAWS AND REGULATIONS ARE INDEPENDENT OF AND SURVIVE THE TERMINATION OF THIS AGREEMENT.

Section 11.03 University Name. LICENSEE agrees not to identify UNIVERSITY in any promotional advertising or other promotional materials to be disseminated to the public or any portion thereof or to use the name of any UNIVERSITY faculty member, employee, or student or any trademark, service mark, trade name, or symbol of UNIVERSITY, without UNIVERSITY'S prior written consent.

Section 11.04 Press. Notwithstanding Section 11.03, UNIVERSITY may disclose the existence of this AGREEMENT and non-confidential information regarding the status of LICENSEE's commercialization of LICENSED PRODUCTS in a press release, on-line, or otherwise, and on the UNIVERSITY's website.

Section 11.05 Assignment. This AGREEMENT is binding upon and shall inure to the benefit of UNIVERSITY, its successors and assigns. However, this AGREEMENT shall be personal to LICENSEE, and it is not assignable or transferrable by LICENSEE to any other person or entity without the prior written consent of UNIVERSITY, such consent to be in UNIVERSITY's sole discretion except that LICENSEE may assign this AGREEMENT in connection with the sale of all or substantially all of LICENSEE's assets to a third party, which consent shall not be unreasonably withheld. Any purported sale, transfer or assignment without UNIVERSITY's prior written consent shall be void ab initio, and this AGREEMENT shall immediately terminate. For purposes of this Section, "transfer" shall include any transfer by operation of law, merger, consolidation, dissolution, or otherwise (whether voluntary or involuntary).

Section 11.06 Sponsored Research. If LICENSEE desires UNIVERSITY participation in performing research and development activities directed towards PATENT RIGHTS, negotiation for such assistance shall be separate and apart from this AGREEMENT, and shall be performed according to UNIVERSITY'S procedures related to research grant and contract activities.

Section 11.07 Consulting. In the event LICENSEE wishes to engage the inventors as consultants, such an arrangement shall be separate and apart from this AGREEMENT, but shall be in keeping with UNIVERSITY'S policy on consulting and ownership of intellectual property developed by UNIVERSITY employees.

Section 11.08 Notices. Any payment, notice, or other communication given under this AGREEMENT (except for correspondence relating to patent preparation, filing, prosecution and/or maintenance matters under Article VII herein) shall be in writing and shall be deemed delivered when sent by certified first class mail, registered mail, or overnight courier, or by facsimile, provided that a copy of such facsimile is promptly sent by certified first class mail, registered or overnight courier, addressed to the PARTIES as follows (or at such other addresses as the PARTIES may notify each other in writing):

If to UNIVERSITY:
Office of Technology Management & Industry Relations
Mizzou North, Room 706
115 Business Loop 70 West
Columbia, MO 65211-8375
Attn: Director

If to LICENSEE:
Accounts Payable:
YIELD10 BIOSCIENCE
19 PRESIDENTIAL WAY
Wobunn, MA 01801

Section 11.09 No Other Relationship. In assuming and performing the respective obligations under this AGREEMENT, LICENSEE and UNIVERSITY are each acting as independent parties and neither shall consider itself or represent itself as a joint venture, partner, agent or employee of the other.

Section 11.10 No Waiver. None of the terms, covenants, and conditions of this AGREEMENT can be waived except by the written consent of the PARTY waiving compliance. A failure by one of the PARTIES to this AGREEMENT to assert its rights for or upon any breach or default of this AGREEMENT shall not be deemed a waiver of such rights nor shall any such waiver be implied from acceptance of any payment. No such failure or waiver in writing by any one of the PARTIES hereto with respect to any rights, shall extend to or affect any subsequent breach or impair any right consequent thereon.

Section 11.11 Severability. If any sentence, paragraph, clause or combination of the same is found by a court of competent jurisdiction to be in violation of any applicable law or regulation, or is unenforceable or void for any reason whatsoever, such sentence, paragraph, clause or combinations of the same shall be severed from the AGREEMENT and the remainder of the AGREEMENT shall remain binding upon the PARTIES.

Section 11.12 Headings. The headings of the paragraphs of this AGREEMENT are inserted for convenience only and shall not constitute a part hereof.

Section 11.13 Choice of Law and Venue. This AGREEMENT shall be construed, interpreted, and applied in accordance with the laws of the State of Missouri. Any action to enforce the provisions of the AGREEMENT shall be brought in a court of competent jurisdiction and proper venue in the State of Missouri. LICENSEE irrevocably submits to the jurisdiction of such courts in any such action or proceeding. LICENSEE further irrevocably and unconditionally waives any objection to the laying of venue of any suit, action or proceeding in such courts and irrevocably waives and agrees not to plead or claim in any court that such suit, action or proceeding brought in any such court has been brought in an inconvenient forum.

Section 11.14 Sovereign Immunity. The PARTIES agree that nothing in this AGREEMENT is intended or shall be construed as a waiver, either express or implied, of any of the immunities, rights, benefits, defenses or protections provided to UNIVERSITY or LICENSEE under governmental or sovereign immunity laws from time to time applicable to UNIVERSITY or LICENSEE.

Section 11.15 Counterparts. This AGREEMENT may be executed in two or more counterparts, each of which shall be deemed an original and all of which together shall constitute but one and the same instrument.

Section 11.16 Entire Agreement. This AGREEMENT constitutes the entire and only agreement between the PARTIES for PATENT RIGHTS and all other prior negotiations, representations, agreements, and understandings are superseded hereby. No agreements altering or supplementing the terms hereof may be made except by a written document signed by both PARTIES.

IN WITNESS WHEREOF, the PARTIES hereto have executed this AGREEMENT in duplicate originals by their duly authorized officers or representatives.

THE CURATORS OF THE UNIVERSITY OF MISSOURI		LICENSEE	
BY:	/s/ Christopher Fender	BY:	/s/ Oliver P. Peoples
NAME:	Christopher Fender	NAME:	Oliver P. Peoples
TITLE:	Director, OTMIR	TITLE:	President and CEO
DATE	May 17, 2018	DATE	May 14, 2018

APPENDIX A: INTELLECTUAL PROPERTY RIGHTS

MU Reference Number	Patent Type	Country	Application No.
15UMCO23	PCT		PCT/1JS2016/011386
15UMCO23	Provisional	United States	62/211,371
17UMC003	Provisional	United States	62/359,635
17UMC003	PCT		PCT/US2017/040851

APPENDIX B: COMMERCIALIZATION PLAN

Yield10 plans to pursue commercialization efforts using the technology in three crops. The commercialization activity will be carried out in 5 phases with each phase being dependent on the results of the previous phase. Here we will described in detail the approach and timelines for Phase 1 and provide an outline of the key issues to be addressed in each of the subsequent phases. The License Agreement provides for updating the Commercialization Plan

- Phase 1, Technical development
- Phase 2. Initial field trials of engineered oilseed lines
- Phase 3. Processing and product evaluation of seed from field trials
- Phase 4. Application for regulatory approval
- Phase 5. Commercial launch

Phase l. Technical Development

Two distinct but potentially complementary technologies are included in the license.

Technology 1: PCT Application No. US2016/011386 filed on July 7, 2016 covers the approach of reducing the activity of a key regulator of acetyl-CoA carboxylase activity in plants. Examples in the patent application described a traditional GMO approach using RNAi constructs to reduce the expression of the BadC gene resulting in increased seed oil production.

Technology 2: PCT Application No. US2016/011386 filed on July 6, 2017 used a traditional GMO approach to introduce a gene from a different plant species to increase the level of a subunit of the acetyl-CoA carboxylase enzyme which is naturally present at low concentration. By increasing the level of this subunit in the plants using a transgene, the acetyl-CoA carboxylase activity was increased resulting in a higher oil content. Although not described here in detail Yield10 plans to begin work on developing new lines of Camelina and canola with this trait [***].

Technology 1 requires the reduction or elimination of the regulatory subunit for the acetyl-CoA carboxylase enzyme encoded by the BadC gene making it an ideal target for genome editing. Genome editing is a preferred approach because it has the potential to dramatically reduce regulatory costs and time to market. Yield10 will focus on this technology first and begin work on Technology 2 once we reach the first milestones for Technology 1. We plant to deploy the BadC trait in 3 oilseed crops, Camelina an industrial oilseed, canola a major edible oil crop grown mostly in Canada and soybean. The timelines for development in each of these crops is different with Camelina being the fastest with canola second followed by soybean.

Yield10 has a robust genome editing system in place for Camelina and has produced genome edited lines, completed the documentation, filed for and received non-regulated status for genome edited lines for one of its other gene targets from USDA-APHIS. These lines which have modification to other oil related genes are being scaled up for field studies. Although we refer to the BadC gene, in fact there are a number of copies of this gene in the plant genomes being targeted and there are different numbers of genomes in each plant species.

Camelina: Camelina is the fastest way to validate the performance of the licensed technologies in field trials and has been successfully leveraged by Yield10 for the execution of field testing and optimization of its lead seed yield trait in the last two growing seasons. Genome editing of BadC in Camelina was initiated following the execution of the Exclusive Option Agreement with the University in 2017 with the initial effort focused on identifying all of the copies of the BadC gene in this plant. There are 3 different copies of the BadC gene in the Camelina, an allohexaploid (3 genomes) so 9 BadC gene targets in total. Using the CRISPR/cas9 genome editing tool we developed transgenic lines expressing the Cas9 nuclease and guide RNAs designed to inactivate 6 or 9 of the BadC gene targets at our Research facilities in Canada. We are just beginning the screening process to identify Camelina lines with edits in the BadC gene targets and expect this phase of the work to be completed by [***]. The timelines for the subsequent development of genome edited BadC Camelina lines is shown in the table below. We anticipate having stable edited lines and initial oil content data from greenhouse studies by [***] and then moving forward with field trials as outlined in Phase 2.

Camelina Project Plan and Timelines

Task Name	Timeline	Milestone
1. [***]	[***]	[***]
a. [***]	[***]	
b. [***]	[***]	[***]
c. [***]	[***]	
d. [***]	[***]	
e. [***]	[***]	[***]

Canola: Evaluation of the canola genome has identified 2 BadC genes one of which is present in two copies per genome. The canola germplasm Yield10 is using is a tetraploid making a total of 6 BadC genes to be edited. Editing of the BadC genes has been ongoing and we are now reaching the stage where we will [***]. The timelines for the subsequent development of genome edited BadC canola lines is shown in the table below.

Canola Project Plan and Timelines

Task Name	Timeline	Milestone
1. [***]	[***]	[***]
a. [***]	[***]	
b. [***]	[***]	
c. [***]	[***]	
d. [***]	[***]	
e. [***]	[***]	
f. [***]	[***]	[***]
g. [***]	[***]	[***]

Soybean: Yield10 is currently working with two diploid soybean lines. The identifications of all soybean BadC genes is currently ongoing.

Soybean Project Plan and Timelines

Task Name	Start	Milestones
1. [***]	[***]	
a. [***]	[***]	
b. [***]	[***]	
c. [***]	[***]	[***]

Phase 2. Initial field trials of engineered oilseed lines ([***]**)**

With the genome editing approach being used by Yield10, the first step will be to [***]. The genome analysis, documentation and application for non-regulated status will be carried out beginning in [***]. It is preferable to wait until non-regulated status is achieved before any field planting including for cage trails to produce clean seed for larger trials. This means that field testing of genome edited lines may not begin until the [***] growing season with data not being available until [***].

As an interim step Yield10 will explore ways to accelerate the development of field data in cooperation with Prof. Thelen, the inventor at U. Missouri [***] both of the licensed technologies that he developed during the research that led to the inventions. These discussions are expected to commence on completion of execution of the License Agreement and this section may be updated pending the outcome of those discussions.

Examples of key objectives of initial field testing are:

- Impact of BadC editing on seed emergence and stand establishment
- Impact of BadC editing on seed oil content
- Impact of BadC editing on shatter and other seed pod characteristics
- Impact of BadC editing on seed yield

It will be critical that an increased oil content due to the genome editing of the BadC gene does not create yield drag as this may severely impact the economic viability (oil yield per harvested acre) of the high oil trait.

Milestone: Field validation of the BadC technology and quantitative data on increase on seed oil content in Camelina and impact on seed yield and protein quality.

Phase 3. Processing and product evaluation of seed from field trials ([***]**)**

In order to develop data for regulatory approval and to demonstrate processing of seed produced using BadC edited lines, we plan to harvest all seed from trials and carry out pilot scale extraction studies using both the traditional solvent based and non-solvent based routes. Yieldl 0 staff are familiar with service providers for pilot extraction studies. Although it is simply too early to map these studies out in more detail there are 3 key questions that need to be addressed:

- Impact of increased oil content on recovery unit operations
- Changes to oil composition
- Impact on the increased oil on meal and in particular protein quality

Key economic drivers of the value of the high oil trait will be achieving the same oil composition and protein meal profile/value.

Milestone: Basic data enabling the development of an economic model for the high oil crops which can be used for future revenue projections.

Phase 4. Application for regulatory approval ([***])

Although we plan to apply for non-regulated status from USDA-APHIS for genome edited BadC lines of Camelina, canola and soybean, additional approvals may be needed from other government agencies (FDA and possibly EPA) prior to commercial launch depending on the target markets.

Milestone: Complete approval for commercial planting and sale.

Phase 5. Commercial launch

During the course of developing lines suitable for commercial launch, Yield10 expects to enter discussions with third parties for both Specialty and Commodity crop applications of the technology. It is simply too early to speculate what those arrangements could look like.

Milestone: First commercial sale and revenue.

Financial Resources

Yield10 is publicly traded on the NASDAQ market with the ticker symbol YTEN. In 2017, Yield10 raised a total of $17 million in tow public offerings. Proceeds from these offerings is expected to fund the company well into 2019. As part of these offerings the investors received warrants to purchase additional shares at a price of $2.25 per share. Approximately one third of the warrants have a 9 month term with the remainder being for 5 years. In the event all of these warrants get converted in the next 18 months this will result in an additional $20 million of funding. These funds would take the company [***] the key milestones. In addition the company has the ability to raise additional funds through either public or private financings and through partnerships. For example the Company recently signed an Agreement with Monsanto to allow then to test the C3003 yield trait in soybean.

APPENDIX C: NOTICE OF FIRST COMMERCIAL SALE

DATE OF LICENSE AGREEMENT:
LICENSEE NAME:
ADDRESS:
REPORT DATE:
INSTRUCTIONS: *Please fill in all boxes (write "none" if not applicable), and sign and date at bottom.*

Commercial name of the Licensed Product

Place of manufacture

Manufacturer name and address (if not licensee)

Date of first commercial sale

Country of first commercial sale

Patent application(s) and/or issued patent(s) of the University covering the Licensed Product

By signing below, I both certify that I am an authorized representative for the LICENSEE and that the information above is true and correct to the best of my knowledge.

By _____ Date _____
Signature of authorized representative

Printed Name: _____ Title: _____

Email Address:
Telephone No: Fax No:

APPENDIX D: ANNUAL REPORT TEMPLATE (AFTER FIRST COMMERCIAL SALE)

Date of License Agreement:

Licensee Name:

Reporting Period:

Report Date:

INSTRUCTIONS: *Please provide all information (write "none" if not applicable), and sign and date at bottom.*

LICENSED PRODUCT commercial name:

LICENSED PRODUCT commercial product no.:

Patent application(s) and/or issued patent(s) of
the UNIVERSITY covering the LICENSED PRODUCT:

Government Approvals *(provide details):*

Annual Summary Report of SALES by LICENSEE:

Country of Sales	
No. of Units Sold	
Unit Price ($)	
Gross Sales ($)	
Exchange Rate (if applicable)	
Allowable offsets ($) (provide details, below)	
Total Net Sales ($)	
Royalty rate (reference to the data source for determining if a particular LICENSED PRODUCT is designated a NICHE CROP or COMMODITY CROP, e.g. 1 bag of seed sold = 1 acre)	
Creditable Minimum Annual Royalties Paid	
Royalties Due ($) with this Report	

Details of allowable offsets:

By signing below, I both certify that I am an authorized representative for the LICENSEE and that the information above is true and correct to the best of my knowledge.

By _____ Date _____

Signature of authorized representative

Printed Name: _____ Title: _____

Email Address:
Telephone No: Fax No:

***Portions of the exhibit, indicated by the mark "[***],"* were omitted and have been filed separately with the Securities and Exchange Commission pursuant to the Registrant's application requesting confidential treatment pursuant to Rule 24b-2 under the Securities Exchange Act of 1934, as amended.**

APPENDIX E: ANNUAL COMMERCIALIZATION REPORT

Date of License Agreement:

Licensee Name:

Reporting Period:

Report Date:

INSTRUCTIONS: *Please provide all information (write "none" if not applicable), and sign and date at bottom.*

A. Commercialization efforts and accomplishments during the previous year: Research and development expenditures and progress:

Regulatory filings and approvals:

Manufacturing activities:

Marketing activities:

Jobs created (# of full and part-time Fits):

Capital raised and source(s) of funding:

Other efforts and accomplishments:

B. Sales during the previous year:

Country of Sales
Total No. of Units Sold
Unit Price ($)
Total Gross Sales ($)
Exchange Rate (if applicable)
Total Allowable offsets ($) (provide details, below)
Total Net Sales ($)
Royalty rate
Creditable Minimum Annual Royalties Paid ($)
Total Royalties Paid to University ($)

Commercialization plans for the upcoming year:

By signing below, I both certify that I am an authorized representative for the LICENSEE and that the information above is true and correct to the best of my knowledge.

By _____ Date _____
Signature of authorized representative

Printed Name: _____ Title: _____

Email Address:
Telephone No: Fax No:

EXHIBIT 31.1

CERTIFICATION

I, Oliver Peoples, certify that:

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

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

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

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

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

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

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

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

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

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

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

Dated: August 9, 2018

/s/ OLIVER PEOPLES

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

EXHIBIT 31.2

CERTIFICATION

I, Charles B. Haaser, certify that:

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

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

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

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

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

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

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

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

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

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

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

Dated: August 9, 2018

/s/ CHARLES B. HAASER

Name: Charles B. Haaser

Title: *Chief Accounting Officer*
(Principal Financial and Accounting Officer)

EXHIBIT 32.1

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

In connection with the Quarterly Report on Form 10-Q of Yield10 Bioscience, Inc. (the "Company") for the quarter ended June 30, 2018 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: August 9, 2018

/s/ OLIVER PEOPLES

President and Chief Executive Officer
(Principal Executive Officer)

Dated: August 9, 2018

/s/ CHARLES B. HAASER

Chief Accounting Officer
(Principal Financial and Accounting Officer)