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

FORM 10-Q

(Mark One)

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

For the Quarterly Period Ended June 30, 2019

or

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

For the Transition Period from _____ to _____

Commission file number: 001-36019

TONIX PHARMACEUTICALS HOLDING CORP.

(Exact name of registrant as specified in its charter)

Nevada	**26-1434750**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)

509 Madison Avenue, Suite 1608
New York, New York 10022
(Address of principal executive offices) (zip code)

(212) 980-9155
(Registrant's telephone number, including area code)

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock	TNXP	The NASDAQ Global Market

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

Indicate by check mark whether the registrant has submitted electronically 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 ☐

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

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☒	Smaller reporting company	☒
		Emerging growth company	☐

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

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

As of August 8, 2019, there were 15,362,112 shares of registrant's common stock outstanding.

TONIX PHARMACEUTICALS HOLDING CORP.

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PART I – FINANCIAL INFORMATION

ITEM 1. FINANCIAL STATEMENTS

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED BALANCE SHEETS
(In Thousands, Except Par Value and Share Amounts)

	June 30, 2019 (unaudited)	December 31, 2018
ASSETS		
Current assets:		
Cash and cash equivalents	$ 12,150	$ 25,034
Prepaid expenses and other	2,009	1,022
Total current assets	14,159	26,056
Property and equipment, net	36	43
Operating lease right-of-use assets	580	—
Security deposit	13	
Restricted cash	100	100
Intangible asset	120	120
Total assets	$ 15,008	$ 26,319
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 1,044	$ 1,404
Accrued expenses and other current liabilities	562	1,251
Operating lease liabilities, current	441	—
Total current liabilities	2,047	2,655
Operating lease liabilities, noncurrent	139	—
Total liabilities	2,186	2,655
Commitments (See Note 10)		
Stockholders' equity:		
Preferred stock, $0.001 par value; 5,000,000 shares authorized		
Series A Convertible Preferred stock, $0.001 par value; 11,984 shares designated; 0 and 9,856 shares issued and outstanding as of June 30, 2019 and December 31, 2018, respectively	—	—
Common stock, $0.001 par value; 150,000,000 shares authorized; 6,338,320 and 3,251,970 shares issued and outstanding as of June 30, 2019 and December 31, 2018, respectively, and 23,792 and 1,758 shares to be issued as of June 30, 2019 and December 31, 2018, respectively	6	3
Additional paid in capital	213,380	212,154
Accumulated deficit	(200,525)	(188,452)
Accumulated other comprehensive loss	(39)	(41)
Total stockholders' equity	12,822	23,664
Total liabilities and stockholders' equity	$ 15,008	$ 26,319

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(In Thousands, Except Share and Per Share Amounts)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
COSTS AND EXPENSES:				
Research and development	$ 3,554	$ 4,067	$ 7,450	$ 9,237
General and administrative	2,352	2,076	4,753	3,894
	5,906	6,143	12,203	13,131
Operating loss	(5,906)	(6,143)	(12,203)	(13,131)
Interest income, net	66	56	130	109
Net loss	$ (5,840)	$ (6,087)	$ (12,073)	$ (13,022)
Net loss per common share, basic and diluted	$ (0.95)	$ (7.23)	$ (2.19)	$ (15.98)
Weighted average common shares outstanding, basic and diluted	6,167,012	842,041	5,511,249	815,120

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS
(In Thousands)
(unaudited)

	Three months ended June 30,		Six months ended June 30,	
	2019	2018	2019	2018
Net loss	$ (5,840)	$ (6,087)	$ (12,073)	$ (13,022)
Other comprehensive (loss) gain:				
Foreign currency translation (loss) gain	—	(21)	2	(22)
Comprehensive loss	$ (5,840)	$ (6,108)	$ (12,071)	$ (13,044)

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
SIX MONTHS ENDED JUNE 30, 2019
(In Thousands, Except Share and Per Share Amounts)
(unaudited)

	Series A Convertible Preferred stock		Common stock		Additional Paid in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total
	Shares	Amount	Shares	Amount				
Balance, December 31, 2018	9,856	$ —	3,251,970	$ 3	$ 212,154	$ (41)	$ (188,452)	$ 23,664
Issuance of common stock upon conversion of Series A Convertible preferred stock	(9,856)	—	2,816,000	3	(3)	—	—	—
Issuance of common stock in exchange for exercise of warrants in March 2019 ($3.50 per share)	—	—	20,000	—	70	—	—	70
Employee stock purchase plan	—	—	1,758	—	3	—	—	3
Stock-based compensation	—	—	—	—	305	—	—	305
Foreign currency transaction gain	—	—	—	—	—	2	—	2
Net loss	—	—	—	—	—	—	(6,233)	(6,233)
Balance, March 31, 2019	—	—	6,089,728	6	212,529	(39)	(194,685)	17,811
Issuance of common stock under 2018 Purchase Agreement	—	—	227,540	—	387	—	—	387
Issuance of common stock under At-the-market offering, net of transactional expenses of $1	—	—	21,052	—	33	—	—	33
Stock-based compensation	—	—	—	—	431	—	—	431
Foreign currency transaction loss	—	—	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	(5,840)	(5,840)
Balance, June 30, 2019	—	$ —	6,338,320	$ 6	$ 213,380	$ (39)	$ (200,525)	$ 12,822

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
SIX MONTHS ENDED JUNE 30, 2018
(In Thousands, Except Share and Per Share Amounts)
(unaudited)

	Series A Convertible Preferred stock		Common stock		Additional Paid in Capital	Accumulated Other Comprehensive Loss	Accumulated Deficit	Total
	Shares	Amount	Shares	Amount				
Balance, December 31, 2017	—	$ —	785,874	$ 1	$ 186,990	$ (12)	$ (162,363)	$ 24,616
Issuance of common stock related to restricted stock units	—	—	75	—	—	—	—	—
Issuance of common stock in March ($32.10 per share), net of transaction expenses of $45	—	—	18,000	—	532	—	—	532
Stock-based compensation	—	—	—	—	399	—	—	399
Foreign currency transaction loss	—	—	—	—	—	(1)	—	(1)
Net loss	—	—	—	—	—	—	(6,935)	(6,935)
Balance, March 31, 2018	—	—	803,949	1	187,921	(13)	(169,298)	18,611
Issuance of common stock in April ($32.10 per share)	—	—	45,000	—	1,315	—	—	1,315
Issuance of common stock in June 2018 under At-the-market offering, net of transaction expenses of $50	—	—	35,910	—	1,615	—	—	1,615
Stock-based compensation	—	—	—	—	409	—	—	409
Foreign currency transaction loss	—	—	—	—	—	(21)	—	(21)
Net loss	—	—	—	—	—	—	(6,087)	(6,087)
Balance, June 30, 2018	—	$ —	884,859	$ 1	$ 191,260	$ (34)	$ (175,385)	$ 15,842

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(In Thousands)
(unaudited)

	Six months ended June 30,	
	2019	2018
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (12,073)	$ (13,022)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	16	30
Stock-based compensation	736	808
Changes in operating assets and liabilities:		
Prepaid expenses	(987)	(444)
Accounts payable	(358)	342
Operating lease liabilities	2	—
Accrued expenses and other liabilities	(691)	30
Net cash used in operating activities	(13,355)	(12,256)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchase of furniture and fixtures	(10)	(4)
Net cash used by investing activities	(10)	(4)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from exercise of warrants	70	—
Proceeds, net of $1 and $95 expenses, from sale of common stock	420	3,462
Net cash provided by financing activities	490	3,462
Effect of currency rate change on cash	(9)	(19)
Net decrease in cash, cash equivalents and restricted cash	(12,884)	(8,817)
Cash, cash equivalents and restricted cash beginning of the period	25,134	25,585
Cash, cash equivalents and restricted cash end of period	$ 12,250	$ 16,768
Non-cash financing activities:		
Issuance of common stock under employee benefit plan	$ 3	$ —

See the accompanying notes to the condensed consolidated financial statements

NOTE 1 – BUSINESS

Tonix Pharmaceuticals Holding Corp., through its wholly owned subsidiary Tonix Pharmaceuticals, Inc. ("Tonix Sub"), is a clinical-stage biopharmaceutical company focused on discovering and developing small molecules and biologics to treat psychiatric, pain and addiction conditions, and biological products to improve biodefense through potential medical counter-measures. All drug product candidates are still in development.

The consolidated financial statements include the accounts of Tonix Pharmaceuticals Holding Corp. and its wholly owned subsidiaries, Tonix Sub, Krele LLC, Tonix Pharmaceuticals (Canada), Inc., Tonix Medicines, Inc., Tonix Pharma Holdings Limited and Tonix Pharma Limited (collectively hereafter referred to as the "Company" or "Tonix").

Going concern

The accompanying financial statements have been prepared on a basis which assumes that the Company will continue as a going concern and which contemplates the realization of assets and satisfaction of liabilities and commitments in the normal course of business. The Company has suffered recurring losses from operations and negative cash flows from operating activities. At June 30, 2019, the Company had working capital of approximately $12.1 million. At June 30, 2019, the Company had an accumulated deficit of approximately $200.5 million. The Company held cash and cash equivalents of approximately $12.2 million as of June 30, 2019. The Company believes that these resources will be sufficient to meet its projected operating requirements through the end of 2019, but it does not have enough resources to meet its operating requirements for the one-year period from the date of filing of this report. These factors raise substantial doubt about the Company's ability to continue as a going concern.

The Company continues to face significant challenges and uncertainties and, as a result, the Company's available capital resources may be consumed more rapidly than currently expected due to changes the Company may make in its research and development spending plans. The Company may seek to obtain additional funding through public or private financing or collaborative arrangements with strategic partners to increase the funds available to fund operations. However, the Company may not be able to raise capital with terms acceptable to the Company. Without additional funds, the Company may be forced to delay, scale back or eliminate some of its research and development activities, or other operations and potentially delay product development in an effort to provide sufficient funds to continue its operations. If any of these events occurs, the Company's ability to achieve its development and commercialization goals would be adversely affected. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

NOTE 2 – SIGNIFICANT ACCOUNTING POLICIES

Interim financial statements

The unaudited condensed consolidated interim financial statements of the Company have been prepared in accordance with accounting principles generally accepted in the United States ("GAAP") for interim financial information and the instructions to Form 10-Q and Article 8 of Regulation S-X. Accordingly, they do not include all of the information and footnotes required by GAAP for complete financial statements. In the opinion of management, all adjustments (consisting of normal recurring accruals) considered necessary for a fair presentation have been included.

The condensed consolidated balance sheet as of December 31, 2018 contained herein has been derived from audited financial statements.

Operating results for the three and six months ended June 30, 2019 are not necessarily indicative of results that may be expected for the year ending December 31, 2019. These condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes thereto for the year ended December 31, 2018 included in the Company's Annual Report on Form 10-K, filed with the Securities and Exchange Commission ("SEC") on March 18, 2019.

Recent accounting pronouncements

In February 2016, the FASB established ASC Topic 842, Leases (Topic 842), by issuing ASU No. 2016-02, which requires lessees to recognize leases on-balance sheet and disclose key information about leasing arrangements. The new standard establishes a right-of-use (ROU) model that requires a lessee to recognize a ROU asset and lease liability on the balance sheet. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the statement of operations. The Company adopted the new standard on January 1, 2019.

The new standard provides a number of optional practical expedients in transition. The Company has elected the 'package of practical expedients', which permit it not to reassess under the new standard its prior conclusions about lease identification, lease classification and initial direct costs. The Company did not elect the use-of-hindsight or the practical expedient pertaining to land easements; the latter is not applicable to the Company.

The new standard has had a material effect on the Company's financial statements. The most significant effects of adoption relate to (1) the recognition of new ROU assets and lease liabilities on its balance sheet for operating leases; and (2) providing new disclosures about its leasing activities.

The new standard also provides practical expedients for an entity's ongoing accounting. The Company elected the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, the Company will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. In connection with the adoption of this standard, the Company made changes to its disclosed lease recognition policies and practices, as well as to other related financial statement disclosures due to the adoption of this standard. The standard did not have a material impact on the Company's results of operations or liquidity.

Upon adoption, the Company recognized operating lease liabilities of approximately $0.3 million based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. The Company recognized corresponding ROU assets of approximately $0.3 million.

Risks and uncertainties

The Company's primary efforts are devoted to conducting research and development of innovative pharmaceutical and biological products to address public health challenges. The Company has experienced net losses and negative cash flows from operations since inception and expects these conditions to continue for the foreseeable future. Further, the Company does not have any commercial products available for sale and has not generated revenues, and there is no assurance that if its products are approved for sale, that the Company will be able to generate cash flow to fund operations. In addition, there can be no assurance that the Company's research and development will be successfully completed or that any product will be approved or commercially viable.

Use of estimates

The preparation of financial statements in accordance with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosures of contingent assets and liabilities at the date of the financial statements, and the reported amounts of expenses during the reporting period. Actual results could differ from those estimates. Significant estimates include the useful life of fixed assets, assumptions used in the fair value of stock-based compensation and other equity instruments, and the percent of completion of research and development contracts.

Cash, cash equivalents and restricted cash

The Company considers cash equivalents to be those investments which are highly liquid, readily convertible to cash and have an original maturity of three months or less when purchased. At June 30, 2019 and December 31, 2018, cash equivalents, which consisted of money market funds, amounted to $10.2 million and $10.1 million, respectively. Restricted cash at both June 30, 2019 and December 31, 2018 of approximately $100,000 collateralizes a letter of credit issued in connection with the lease of office space in New York City (see Note 9).

The following table provides a reconciliation of cash, cash equivalents and restricted cash reported within the condensed consolidated balance sheets that sum to the total of the same amounts shown in the condensed consolidated statement of cash flow:

	June 30, 2019	December 31, 2018
	(in thousands)	
Cash and cash equivalents	$ 12,150	$ 25,034
Restricted cash	100	100
Total	$ 12,250	$ 25,134

Property and equipment

Property and equipment are stated at cost, less accumulated depreciation. Depreciation is calculated using the straight-line method over the asset's estimated useful life, which is three years for computer assets, five years for furniture and all other equipment and term of lease for leasehold improvements. Expenditures for maintenance and repairs are expensed as incurred. Depreciation and amortization expense for the three and six months ended June 30, 2019 was $7,000 and $16,000, respectively, and $15,000 and $30,000, respectively, for the three and six months ended June 30, 2018. All property and equipment is located in the United States and Ireland.

Intangible asset with indefinite lives

During 2015, the Company purchased certain internet domain rights, which were determined to have an indefinite life. Identifiable intangibles with indefinite lives are not amortized but are tested for impairment annually or whenever events or changes in circumstances indicate that its carrying amount may be less than fair value. As of June 30, 2019, the Company believed that no impairment existed.

Leases

The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, operating lease liabilities, current and operating lease liabilities, noncurrent in the Company's condensed consolidated balance sheets. ROU assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent its obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As the Company's leases do not provide an implicit rate, the Company uses an incremental borrowing rate based on the information available at the transition date and commencement date in determining the present value of lease payments. This is the rate the Company would have to pay if borrowing on a collateralized basis over a similar term to each lease. The operating lease ROU asset also includes any lease payments made and excludes lease incentives. The Company's lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense for lease payments is recognized on a straight-line basis over the lease term.

Upon adoption, the Company recognized operating lease liabilities of approximately $0.3 million based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. The Company also recognized corresponding ROU assets of approximately $0.3 million. In January 2019, the Company entered into a new operating lease, resulting in the Company recognizing an operating lease liability of approximately $0.4 million based on the present value of the minimum rental payments. The Company also recognized corresponding ROU assets of approximately $0.4 million. In April 2019, the Company entered into a lease amendment, resulting in the Company recognizing an additional operating lease liability of approximately $0.1 million based on the present value of the minimum rental payments. The Company also recognized a corresponding increase to ROU assets of approximately $0.1 million.

Research and development costs

The Company outsources certain of its research and development efforts and expenses these costs as incurred, including the cost of manufacturing products for testing, as well as licensing fees and costs associated with planning and conducting clinical trials. The value ascribed to patents and other intellectual property acquired has been expensed as research and development costs, as such property related to particular research and development projects and had no alternative future uses.

The Company estimates its expenses resulting from its obligations under contracts with vendors, clinical research organizations and consultants and under clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations, which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided under such contracts. The Company accounts for trial expenses according to the timing of various aspects of the trial. The Company determines accrual estimates taking into account discussion with applicable personnel and outside service providers as to the progress or state of consummation of trials, or the services completed.

During the course of a clinical trial, the Company adjusts its clinical expense recognition if actual results differ from its estimates. The Company makes estimates of its accrued expenses as of each balance sheet date based on the facts and circumstances known to it at that time. The Company's clinical trial accruals are dependent upon the timely and accurate reporting of contract research organizations and other third-party vendors.

Stock-based compensation

All stock-based payments to employees and to nonemployee directors for their services as directors, including grants of restricted stock units ("RSUs"), and stock options, are measured at fair value on the grant date and recognized in the condensed consolidated statements of operations as compensation or other expense over the relevant service period.

Stock-based payments to nonemployees are recognized as an expense over the period of performance. Such payments are measured at fair value at the earlier of the date a performance commitment is reached, or the date performance is completed. In addition, for awards that vest immediately and are non-forfeitable, the measurement date is the date the award is issued.

Foreign currency translation

Operations of the Canadian subsidiary are conducted in local currency, which represents its functional currency. The U.S. dollar is the functional currency of the other foreign subsidiaries. Balance sheet accounts of the Canadian subsidiary were translated from foreign currency into U.S. dollars at the exchange rate in effect at the balance sheet date and income statement accounts were translated at the average rate of exchange prevailing during the period. Translation adjustments resulting from this process were included in accumulated other comprehensive income (loss) on the condensed consolidated balance sheets.

Comprehensive income (loss)

Comprehensive income (loss) is defined as the change in equity of a business during a period from transactions and other events and circumstances from non-owner's sources. It includes all changes in equity during a period except those resulting from investments by owners and distributions to owners. Other comprehensive income (loss) represents foreign currency translation adjustments.

Income taxes

Deferred income tax assets and liabilities are determined based on the estimated future tax effects of net operating loss and credit carryforwards and temporary differences between the tax basis of assets and liabilities and their respective financial reporting amounts measured at the current enacted tax rates. The Company records a valuation allowance on its deferred income tax assets if it is not more likely than not that these deferred income tax assets will be realized.

The Company recognizes a tax benefit from an uncertain tax position only if it is more likely than not that the tax position will be sustained on examination by taxing authorities, based on the technical merits of the position. The tax benefits recognized in the consolidated financial statements from such a position are measured based on the largest benefit that has a greater than 50% likelihood of being realized upon ultimate settlement. As of June 30, 2019, the Company has not recorded any unrecognized tax benefits.

Per share data

Basic and diluted net loss per common share is calculated by dividing net loss, by the weighted average number of outstanding shares of common stock, adjusted to give effect to the 1-for-10 reverse stock split, which was effected on November 28, 2018 (see Note 5).

As of June 30, 2019, and 2018, there were outstanding warrants to purchase an aggregate of 4,964,846 and 68,561 shares, respectively, of the Company's common stock. In addition, the Company has issued to employees, directors and consultants, options to acquire shares of the Company's common stock, of which 1,090,044 and 140,636 were outstanding at June 30, 2019 and 2018, respectively (see Note 7). In computing diluted net loss per share for the three and six months ended June 30, 2019 and 2018, no effect has been given to such options, warrants and restricted stock units as their effect would be anti-dilutive.

NOTE 3 – FAIR VALUE MEASUREMENTS

Fair value measurements affect the Company's accounting for certain of its financial assets. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date and is measured according to a hierarchy that includes:

Level 1: Observable inputs, such as quoted prices in active markets.

Level 2: Inputs, other than quoted prices in active markets, that are observable either directly or indirectly. Level 2 assets and liabilities include debt securities with quoted market prices that are traded less frequently than exchange-traded instruments. This category includes U.S. government agency-backed debt securities and corporate-debt securities.

Level 3: Unobservable inputs in which there is little or no market data.

As of June 30, 2019, and December 31, 2018, the Company had Level 1 quoted prices in active markets of $10.2 million and $10.1 million, respectively, consisting entirely of cash equivalents.

NOTE 4 – LICENSE AGREEMENT WITH COLUMBIA UNIVERSITY

On May 20, 2019, the Company entered into an exclusive License Agreement (the "License Agreement") with the Trustees of Columbia University in the City of New York ("Columbia") pursuant to which Columbia, for itself and on behalf of the University of Kentucky and the University of Michigan (collectively, the "Institutions") granted to the Company an exclusive license, with the right to sublicense, certain patents, technical information and material (collectively, the "Technology") related to a double-mutant cocaine esterase, and to develop and commercialize products thereunder (each, a "Product"). Pursuant to the terms of the License Agreement, Columbia has reserved for itself and the Institutions the right to practice the Technology for academic research and educational purposes.

The Company has agreed to pay a six-digit license fee to Columbia as consideration for entering into the License Agreement. The Company is obligated to use Commercially Reasonable Efforts, as defined in the License Agreement, to develop and commercialize the Product, and to achieve specified developmental milestones. The first 50% of the license fee was paid by June 30, 2019, while the remaining 50% license fee has been accrued for within accrued expenses and other current liabilities as of June 30, 2019.

The Company has agreed to pay Columbia single-digit royalties on net sales of (i) Products sold by the Company or a sublicensee and (ii) any other products that involve material or technical information related to the Product and transferred to the Company pursuant to the License Agreement ("Other Products") sold by the Company or a sublicensee. Royalties on each particular Product are payable on a country-by-country and Product-by-Product basis until the latest of (i) the date of expiration of the last valid claim in the last to expire of the issued patents covered by the License Agreement, (ii) a specified period of time after the first commercial sale of a Product in the country in question, or (iii) expiration of any market exclusivity period granted by a regulatory agency. Royalties on each particular Other Product are payable on a country-by-country and product-by-product basis until the later of (i) a specified period of time after the first commercial sale of such particular Other Product in such country or (ii) expiration of any market exclusivity period granted by a regulatory agency. Royalties payable on net sales of the Product and Other Products may be reduced by 50% of the royalties payable by the Company to any third party for intellectual property rights which are necessary for the practice of the rights licensed to the Company under the License Agreement, provided that the royalty payable on a Product or Other Product may not be reduced by more than 50%.

The Company is also obligated to make contingent milestone payments to Columbia totaling $3 million on a Product-by-Product basis upon the achievement of certain development, approval and sales milestones related to a Product. In addition, the Company shall pay Columbia 5% of consideration, other than royalty payments and certain other categories of consideration, payable to the Company by a sublicensee. As of June 30, 2019, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 5 – STOCKHOLDERS' EQUITY

On November 26, 2018, the Company filed a Certificate of Change with the Nevada Secretary of State, which was effective November 28, 2018. Pursuant to the Certificate of Change, the Company effected a 1-for-10 reverse stock split of its issued and outstanding shares of common stock, $0.001 par value, whereby 15,293,782 outstanding shares of the Company's common stock were exchanged for 1,529,427 shares of the Company's common stock. In connection with the reverse stock split, the Company issued an additional 2,833 shares of the Company's common stock due to rounding. Furthermore, pursuant to the Certificate of Change, the number of authorized shares of common stock was reduced from 150 million to 15 million. All per share amounts and number of shares in the condensed consolidated financial statements and related notes have been retroactively restated to reflect the reverse stock split. On May 3, 2019, the Company filed a Certificate of Amendment to its Articles of Incorporation with the Nevada Secretary of State increasing its authorized shares of common stock from 15 million to 150 million.

NOTE 6 – SALE OF COMMON STOCK

December 2018 Financing

On December 7, 2018, the Company entered into an underwriting agreement with Alliance Global Partners ("AGP") and Dawson James Securities, Inc. ("Dawson") (collectively "the Underwriters") pursuant to which the Company sold securities consisting of 861,710 Class A Units at a public offering price of $3.50 per unit, with each unit consisting of one share of Common Stock and a Warrant to purchase one share of Common Stock, and 11,984 Class B Units at a public offering price of $1,000 per unit, with each unit consisting of one share of Series A Convertible Preferred Stock, with a conversion price of $3.50 per share, and Warrants to purchase 285.7143 shares of Common Stock. The Warrants have an exercise price of $3.50, are exercisable and expire five years from the date of issuance.

The Company also granted the underwriters a 45-day option to purchase up to 642,856 shares of common stock and/or additional Warrants to purchase up to 642,856 additional shares of common stock.

The December 2018 Financing closed on December 11, 2018. The Underwriters purchased the Units at a seven-percent discount to the public offering price, for an aggregate discount of approximately $1.1 million (or $0.24 per share). The Company received net proceeds from the December 2018 Financing of approximately $13.6 million, after deducting the underwriting discount and other offering expenses of approximately $0.4 million. Additionally, the Underwriters fully exercised the over-allotment option related to the warrants and purchased additional warrants to acquire 640,000 shares of common stock for net proceeds of approximately $6,000.

On December 13, 2018, the 2018 Underwriters partially exercised the over-allotment option and purchased 250,000 shares of common stock for net proceeds of approximately $0.8 million, net of an aggregate discount of $0.1 million (or $0.24 per share).

During the first quarter of 2019, the remaining 9,856 shares of Series A convertible preferred stock were converted into 2,816,000 shares of common stock. As of March 11, 2019, all Series A convertible preferred stock has been converted into common stock.

2018 Lincoln Park Transaction

On October 18, 2018, the Company entered into a purchase agreement (the "2018 Purchase Agreement") and a registration rights agreement (the "2018 Registration Rights Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"). Pursuant to the terms of the 2018 Purchase Agreement, Lincoln Park has agreed to purchase from us up to $15,000,000 of the Company's common stock (subject to certain limitations) from time to time during the term of the 2018 Purchase Agreement. Pursuant to the terms of the 2018 Registration Rights Agreement, the Company filed with the SEC a registration statement to register for resale under the Securities Act the shares that have been or may be issued to Lincoln Park under the 2018 Purchase Agreement.

Pursuant to the terms of the 2018 Purchase Agreement, at the time the Company signed the 2018 Purchase Agreement and the 2018 Registration Rights Agreement, the Company issued 35,000 shares of common stock to Lincoln Park as consideration for its commitment to purchase shares of our common stock under the 2018 Purchase Agreement. The commitment shares were valued at $245,000 and recorded as an addition to equity for the issuance of the common stock and treated as a reduction to equity as a cost of capital to be raised under the 2018 Purchase Agreement.

During the six months ended June 30, 2019, the Company sold an aggregate of approximately 227,000 shares of common stock under the 2018 Purchase Agreement, for gross proceeds of approximately $0.4 million.

Under applicable rules of the NASDAQ Global Market, the Company could not issue or sell more than 19.99% of the shares of its common stock outstanding immediately prior to the execution of the 2018 Purchase Agreement (approximately 262,000 shares) to Lincoln Park under the 2018 Purchase Agreement without stockholder approval, unless the average price of all applicable sales of its common stock to Lincoln Park under the 2018 Purchase Agreement equals or exceeds a threshold amount. As the Company has issued approximately 262,000 shares to Lincoln Park, by June 30, 2019, under the 2018 Purchase Agreement at less than the threshold amount, the Company will not sell any additional shares under the 2018 Purchase Agreement without shareholder approval.

2018 At-the-Market Offering

On May 1, 2018, the Company entered into a sales agreement (the "Sales Agreement"), with Cowen and Company, LLC., ("Cowen"), pursuant to which the Company may issue and sell, from time to time, shares of its common stock having an aggregate offering price of up to $9.5 million in at-the-market offerings ("ATM") sales. On the same day, the Company filed a prospectus supplement under its existing shelf registration relating to the Sales Agreement. Cowen acted as sales agent and was paid a 3% commission on each sale under the Sales Agreement. The Company's common stock was sold at prevailing market prices at the time of the sale, and, as a result, prices varied.

During the six months ended June 30, 2019, the Company sold an aggregate of 21,052 shares of common stock under the ATM for net proceeds of approximately $33,000.

During the six months ended June 30, 2018, the Company sold an aggregate of 35,910 shares of common stock using the ATM, resulting in net proceeds of $1.6 million, net of expenses of approximately $50,000 of Cowen's commission.

2017 Lincoln Park Transaction

On September 28, 2017, the Company entered into a purchase agreement (the "2017 Purchase Agreement") and a registration rights agreement (the "Registration Rights Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"). Pursuant to the terms of the Purchase Agreement, Lincoln Park has agreed to purchase from the Company up to $15,000,000 of its common stock (subject to certain limitations) from time to time during the term of the 2017 Purchase Agreement. Pursuant to the terms of the Registration Rights Agreement, the Company filed with the SEC a registration statement to register for resale under the Securities Act the shares that have been or may be issued to Lincoln Park under the 2017 Purchase Agreement.

Pursuant to the terms of the 2017 Purchase Agreement, at the time the Company signed the 2017 Purchase Agreement and the Registration Rights Agreement, the Company issued 7,304 shares of common stock to Lincoln Park as consideration for its commitment to purchase shares of its common stock under the Purchase Agreement. The commitment shares were valued at $300,000, recorded as an addition to equity for the issuance of the common stock and treated as a reduction to equity as a cost of capital to be raised under the Purchase Agreement.

During the six months ended June 30, 2018, the Company sold an aggregate of approximately 63,000 shares of common stock under the 2017 Purchase Agreement, for net proceeds of approximately $1.8 million, net of expenses of approximately $45,000. The Company did not sell any shares of common stock under the 2017 Purchase Agreement during the six months ended June 30, 2019.

Under applicable rules of the NASDAQ Global Market, the Company could not issue or sell more than 19.99% of the shares of its common stock outstanding immediately prior to the execution of the 2017 Purchase Agreement (approximately 150,000 shares) to Lincoln Park under the 2017 Purchase Agreement without stockholder approval, unless the average price of all applicable sales of its common stock to Lincoln Park under the 2017 Purchase Agreement equals or exceeds a threshold amount. As the Company has issued approximately 150,000 shares to Lincoln Park, by December 31, 2018, under the 2017 Purchase Agreement at less than the threshold amount, the Company will not sell any additional shares under the 2017 Purchase Agreement without shareholder approval.

NOTE 7 – STOCK-BASED COMPENSATION

2018 Stock Incentive Plan

On June 8, 2018, the Company's stockholders approved the Tonix Pharmaceuticals Holding Corp. 2018 Stock Incentive Plan (the "2018 Plan"). The 2018 Plan provided for the issuance of up to 132,000 shares of common stock. With the adoption of the 2019 Plan (as defined below), no further grants may be made under the 2018 Plan.

2019 Stock Incentive Plan

On May 3, 2019, the Company's stockholders approved the Tonix Pharmaceuticals Holding Corp. 2019 Stock Incentive Plan (the "2019 Plan").

Under the terms of the 2019 Plan, the Company may issue (1) stock options (incentive and nonstatutory), (2) restricted stock, (3) SARs, (4) RSUs, (5) other stock-based awards, and (6) cash-based awards. The 2019 Plan provides for the issuance of up to 1,400,000 shares of common stock, which amount will be increased to the extent that awards granted under the 2019 Plan and the Plans are forfeited, expire or are settled for cash (except as otherwise provided in the 2019 Plan). The Board of Directors determines the exercise price, vesting and expiration period of the grants under the 2019 Plan. However, the exercise price of an incentive stock option may not be less than 110% of fair value of the common stock at the date of the grant for a 10% or more shareholder and 100% of fair value for a grantee who is not a 10% shareholder. The fair value of the common stock is determined based on quoted market price or in absence of such quoted market price, by the Board of Directors in good faith. Additionally, the expiration period of grants under the 2019 Plan may not more than ten years. As of June 30, 2019, 558,300 shares were available for future grants under the 2019 Plan.

General

A summary of the stock option activity and related information for the Plans for the six months ended June 30, 2019 is as follows:

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value
Outstanding at December 31, 2018	137,145	$ 143.09	8.14	$
Grants	955,100	$ 2.17		$
Exercised	—			
Forfeitures or expirations	(2,201)	35.42		
Outstanding at June 30, 2019	1,090,044	$ 19.84	9.32	$ —
Vested and expected to vest at June 30, 2019	1,090,044	$ 19.84	9.32	$ —
Exercisable at June 30, 2019	129,757	$ 131.04	5.96	$ —

The aggregate intrinsic value in the preceding table represents the total pretax intrinsic value, based on options with an exercise price less than the Company's closing stock price at the respective dates.

The weighted average fair value of options granted during the three and six months ended 2019 was $1.65 per share and $1.67 per share, respectively. The weighted average fair value of options granted during the three and six months ended 2018 was $32.93 per share and $28.07 per share, respectively.

The Company measures the fair value of stock options on the date of grant, based on the Black Scholes option pricing model using certain assumptions discussed below, and the closing market price of the Company's common stock on the date of the grant. For employees and directors, the fair value of the award is measured on the grant date and for non-employees, the fair value of the award is generally re-measured on vesting dates and interim financial reporting dates until the service period is complete. Most stock options granted pursuant to the Plans typically vest 1/3rd 12 months from the date of grant and 1/36th each month thereafter for 24 months and expire ten years from the date of grant. In addition, the Company issues options to directors which vest over a one-year period. In addition, the Company also issues performance-based options to executive officers, which options vest when the target parameters are met, and premium options which have an exercise price greater than the grant date fair value, subject in each case to a one year minimum service period prior to vesting. Stock-based compensation expense related to awards is amortized over the applicable vesting period using the straight-line method.

The assumptions used in the valuation of stock options granted during the six months ended June 30, 2019 and 2018 were as follows:

	Six Months Ended June 30, 2019	Six Months Ended June 30, 2018
Risk-free interest rate	2.15% to 2.54%	2.54% to 2.81%
Expected term of option	3.00 to 10.00 years	4.50 to 7.00 years
Expected stock price volatility	107.12% to 109.72%	99.65% to 102.00%
Expected dividend yield	0.0%	0.0%

The risk-free interest rate is based on the yield of Daily U.S. Treasury Yield Curve Rates with terms equal to the expected term of the options as of the grant date. The expected term of options is determined using the simplified method, as provided in an SEC Staff Accounting Bulletin, and the expected stock price volatility is based on the Company' historical stock price volatility.

Stock-based compensation expense relating to options granted of $0.4 million and $0.7 million was recognized for the three and six-month periods ended June 30, 2019, respectively, and $0.4 million and $0.8 million was recognized for the three and six-month periods ended June 30, 2018, respectively.

As of June 30, 2019, the Company had approximately $2.5 million of total unrecognized compensation cost related to non-vested awards granted under the Plans, which the Company expects to recognize over a weighted average period of 2.03 years.

2018 Employee Stock Purchase Plan

On June 8, 2018, the Company's stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2018 Employee Stock Purchase Plan (the "2018 ESPP"). As a result of adoption of the 2019 ESPP, as defined below, by the stockholders, no further grants may be made under the 2018 ESPP Plan.

2019 Employee Stock Purchase Plan

On May 3, 2019, the Company's stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2019 Employee Stock Purchase Plan (the "2019 ESPP").

The 2019 ESPP allows eligible employees to purchase up to an aggregate of 150,000 shares of the Company's common stock. Under the 2019 ESPP, on the first day of each offering period, each eligible employee for that offering period has the option to enroll for that offering period, which allows the eligible employees to purchase shares of the Company's common stock at the end of the offering period. Each offering period under the 2019 ESPP is for six months, which can be modified from time-to-time. Subject to limitations, each participant will be permitted to purchase a number of shares determined by dividing the employee's accumulated payroll deductions for the offering period by the applicable purchase price, which is equal to 85 percent of the fair market value of our common stock at the beginning or end of each offering period, whichever is less. A participant must designate in his or her enrollment package the percentage (if any) of compensation to be deducted during that offering period for the purchase of stock under the 2019 ESPP, subject to the statutory limit under the Code. As of June 30, 2019, 150,000 shares were available for future grants under the 2019 ESPP.

The 2019 and 2018 ESPP are considered compensatory plans with the related compensation cost written off over the six-month offering period. The compensation expense related to the 2019 ESPP for the six months ended June 30, 2019 and 2018 was $24,000 and $0, respectively. As of December 31, 2018, approximately $38,000 of employee payroll deductions, which have been withheld since July 1, 2018, the commencement of the offering period ending December 31, 2018, are included in accrued expenses in the accompanying balance sheet. In January 2019, 1,758 shares that were purchased as of December 31, 2018, were issued under the 2018 ESPP, and approximately $3,000 of employee payroll deductions accumulated at December 31, 2018, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $35,000 was returned to the employees. As of June 30, 2019, approximately $45,000 of employee payroll deductions, which have been withheld since January 1, 2019, the commencement of the offering period ending June 30, 2019, are included in accrued expenses in the accompanying balance sheet. In August 2019, 23,792 shares that were purchased as of June 30, 2019, were issued under the 2019 ESPP, and approximately $29,000 of employee payroll deductions accumulated at June 30, 2019, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $16,000 will be returned to the employees in Q3 2019.

Restricted Stock Units

In May 2017, a total of 563 RSUs vested that were granted to our non-employee directors for board services in 2016, in lieu of cash, with a one-year vesting from the grant date and a fair value of $229 at the date of grant. 488 shares of the Company's common stock were issued upon the vesting of such RSU's during the year ended December 31, 2017. The remaining 75 shares of common stock were issued during the three months ended March 31, 2018.

During the six months ended June 30, 2019 and 2018, no stock-based compensation expense related to RSU grants was expensed.

NOTE 8 – STOCK WARRANTS

The following table summarizes information with respect to outstanding warrants to purchase common stock of the Company at June 30, 2019:

Exercise Price	Number Outstanding	Expiration Date
$ 3.50	4,905,710	December 2023
$ 63.00	54,400	October 2021
$ 69.00	4,736	October 2021
	4,964,846	

During the six months ended June 30, 2019, 20,000 warrants with an exercise price of $3.50 were exercised for proceeds of approximately $70,000.

During the six months ended June 30, 2019 and June 30, 2018, 233 and 108 warrants with a per share exercise price of $2,500 and $1,200, respectively, expired.

NOTE 9 – LEASES

The Company has various operating lease agreements, which are primarily for office space. These agreements frequently include one or more renewal options and require the Company to pay for utilities, taxes, insurance and maintenance expense. No lease agreement imposes a restriction on the Company's ability to engage in financing transactions or enter into further lease agreements. At June 30, 2019, the Company has right-of-use assets of $0.6 million and a total lease liability for operating leases of $0.6 million of which $0.1 million is included in operating lease liabilities, noncurrent and $0.5 million is included in operating lease liabilities, current.

At June 30, 2019, future minimum lease payments for operating leases with non-cancelable terms of more than one year were as follows (in thousands):

Year Ending December 31,	
Remainder of 2019	$ 228
2020	360
2021	6
	$ 594

In January 2019, the Company entered into a new operating lease, resulting in the Company recognizing an operating lease liability of approximately $0.4 million based on the present value of the minimum rental payments. The Company also recognized corresponding ROU assets of approximately $0.4 million. In April 2019, the Company entered into a lease amendment, resulting in the Company recognizing an additional operating lease liability of approximately $0.1 million based on the present value of the minimum rental payments. The Company also recognized a corresponding increase to ROU assets of approximately $0.1 million. As the Company's leases do not provide an implicit rate, the Company uses an incremental borrowing rate based on the information available at the transition date and commencement date in determining the present value of lease payments. Operating lease expense was $0.1 million and $0.2 million for the three and six months ended June 30, 2019. Amortization expense was $0.1 million and $0.2 million for the three and six months ended June 30, 2019.

Other information related to leases was as follows:

	Six Months Ended June,
Cash paid for amounts included in the measurement of lease liabilities:	2019
Operating cash flow from operating leases (in thousands)	$ 221
Weighted Average Remaining Lease Term	
Operating leases	1.77 years
Weighted Average Discount Rate	
Operating leases	3.36%

NOTE 10 – COMMITMENTS

Research and development contracts

The Company has entered into contracts with various contract research organizations with outstanding commitments aggregating approximately $7.7 million at June 30, 2019 for future work to be performed.

Defined contribution plan

The Company has a qualified defined contribution plan (the "401(k) Plan") pursuant to Section 401(k) of the Code, whereby all eligible employees may participate. Participants may elect to defer a percentage of their annual pretax compensation to the 401(k) Plan, subject to defined limitations. The Company is required to make contributions to the 401(k) Plan equal to 100 percent of each participant's pretax contributions of up to six percent of his or her eligible compensation, and the Company is also required to make a contribution equal to three percent of each participant's salary, on an annual basis, subject to limitations under the Code. The Company charged operations $19,000 and $65,000 for the three and six months ended June 30, 2019, respectively, and $31,000 and $62,000 for the three and six months ended June 30, 2018, respectively, for contributions under the 401(k) Plan.

NOTE 11 – SUBSEQUENT EVENTS

July 2019 Financing

On July 16, 2019, the Company entered into an underwriting agreement with Aegis Capital Corp., as representatives of the underwriters (the "Underwriters"), relating to the issuance and sale of 9,000,000 shares of its common stock, in an underwritten public offering (the "July 2019 Financing"). The public offering price for each share of common stock was $0.60. The Company granted the Underwriters a 45-day option to purchase up to an additional 1,350,000 shares of common stock to cover over-allotments, if any.

The July 2019 Financing closed on July 18, 2019. The Underwriters purchased the shares at an eight percent discount to the then current public price, for an aggregate discount of $0.4 million. The Company incurred offering expenses to-date of approximately $0.2 million. The Company received net proceeds of approximately $4.8 million.

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

This Management's Discussion and Analysis of Financial Condition and Results of Operations includes a number of forward-looking statements that reflect Management's current views with respect to future events and financial performance. You can identify these statements by forward-looking words such as "may" "will," "expect," "anticipate," "believe," "estimate" and "continue," or similar words. Those statements include statements regarding the intent, belief or current expectations of us and members of our management team, as well as the assumptions on which such statements are based. Prospective investors are cautioned that any such forward-looking statements are not guarantees of future performance and involve risk and uncertainties, and that actual results may differ materially from those contemplated by such forward-looking statements.

The following discussion contains certain statements that may be deemed "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Readers are urged to carefully review and consider the various disclosures made by us in this report and in our other reports filed with the Securities and Exchange Commission, including our Annual Report on Form 10-K for the year ended December 31, 2018, as filed with the Securities and Exchange Commission on March 18, 2019. Important factors known to us could cause actual results to differ materially from those in forward-looking statements. We undertake no obligation to update or revise forward-looking statements to reflect changed assumptions, the occurrence of unanticipated events or changes in the future operating results over time. We believe that its assumptions are based upon reasonable data derived from and known about our business and operations. No assurances are made that actual results of operations or the results of our future activities will not differ materially from its assumptions. Factors that could cause differences include, but are not limited to: substantial competition; our possible need for additional financing; uncertainties of patent protection and litigation; uncertainties of government or third party payor reimbursement; limited research and development efforts and dependence upon third parties; and risks related to failure to obtain clearances or approvals from the United States Food and Drug Administration, or FDA, and noncompliance with FDA regulations.

Business Overview

We are a clinical-stage biopharmaceutical company focused on discovering and developing small molecules and biologics to treat psychiatric, pain and addiction conditions, to improve biodefense through potential medical counter-measures and to prevent and treat organ transplant rejection. Our most advanced drug development program is focused on delivering a safe and effective long-term treatment for posttraumatic stress disorder, or PTSD. PTSD is characterized by chronic disability, inadequate treatment options, high utilization of healthcare services, and significant economic burden. We have assembled a management team with significant industry experience to lead the development of our product candidates. We complement our management team with a network of scientific, clinical, and regulatory advisors that includes recognized experts in the fields of PTSD, other central nervous system disorders and biodefense.

Our lead product candidate, TNX-102 SL, is a proprietary low-dose cyclobenzaprine, or CBP, sublingual tablet, designed for bedtime administration. TNX-102 SL is an investigational new drug that has not been approved for any indication. TNX-102 SL is in Phase 3 development as a potential treatment for PTSD. We are currently enrolling the Phase 3 RECOVERY trial, which is a double-blind, placebo-controlled study evaluating daily bedtime administration of TNX-102 SL in individuals with PTSD from trauma within 9 years of screening. The FDA has conditionally accepted the proposed trade name Tonmya® for TNX-102 SL for the treatment of PTSD. Tonix is also developing TNX-102 SL as a bedtime treatment for fibromyalgia and agitation in Alzheimer's disease under separate Investigational New Drug applications (IND) to support potential pivotal efficacy studies. The fibromyalgia program is in Phase 3 development and the agitation in Alzheimer's program is Phase 2 ready. We plan to meet with FDA in October 2019 to discuss a new program to study TNX-102 SL as a treatment for alcohol use disorder, or AUD, which will be developed under a separate IND. Our development pipeline also includes TNX-1300 (T172R/G173Q double-mutant cocaine esterase 200 mg, i.v. solution) which is in Phase 2 development for the treatment of cocaine intoxication. TNX-1300 is a recombinant protein enzyme produced through rDNA technology in E. coli bacteria. TNX-1300 is an investigational new biologic that has not been approved for any indication. TNX-601 (tianeptine oxalate) is in the pre-IND application stage, also for the treatment of PTSD but by a different mechanism from TNX-102 SL and designed for daytime dosing. TNX-601 is also in development for the potential indication of neurocognitive dysfunction associated with corticosteroid use. Tonix's two biodefense products are TNX-801 and TNX-701. TNX-801 (live virus vaccine for percutaneous (scarification) administration) is a potential smallpox-preventing vaccine based on a synthetic version of horsepox virus and is currently in the pre-IND application stage. TNX-701 is a biodefense development program for protection from radiation injury in the pre-IND application stage. Finally, TNX-1500 is being developed to prevent and treat organ transplant rejection, as well as to treat autoimmune conditions, and is in the pre-IND application stage.

Current Operating Trends

Our current research and development efforts are focused on developing Tonmya for the treatment of PTSD and TNX-102 SL for the treatment of fibromyalgia, agitation in Alzheimer's Disease and AUD, but we also expend effort on our other pipeline programs, primarily related to TNX-1300, TNX-601, TNX-701, TNX-801 and TNX-1500. Our research and development expenses consist of manufacturing work and the cost of drug ingredients used in such work, fees paid to consultants for work related to clinical trial design and regulatory activities, fees paid to providers for conducting various clinical studies as well as for the analysis of the results of such studies, and for other medical research addressing the potential efficacy and safety of our study drugs. We believe that significant investment in product development is a competitive necessity, and we plan to continue these investments in order to be in a position to realize the potential of our product candidates and proprietary technologies.

We expect that all of our research and development expenses in the near-term future will be incurred in support of our current and future preclinical and clinical development programs rather than technology development. These expenditures are subject to numerous uncertainties relating to timing and cost to completion. We test compounds in numerous preclinical studies for safety, toxicology and efficacy. At the appropriate time, subject to the approval of regulatory authorities, we expect to conduct early-stage clinical trials for each drug candidate. We anticipate funding these trials ourselves, and possibly with the assistance of federal grants, contracts or other agreements. As we obtain results from trials, we may elect to discontinue or delay clinical trials for certain products in order to focus our resources on more promising products. Completion of clinical trials may take several years, and the length of time generally varies substantially according to the type, complexity, novelty and intended use of a product candidate.

The commencement and completion of clinical trials for our products may be delayed by many factors, including lack of efficacy during clinical trials, unforeseen safety issues, slower than expected participant recruitment, lack of funding or government delays. In addition, we may encounter regulatory delays or rejections as a result of many factors, including results that do not support the intended safety or efficacy of our product candidates, perceived defects in the design of clinical trials and changes in regulatory policy during the period of product development. As a result of these risks and uncertainties, we are unable to accurately estimate the specific timing and costs of our clinical development programs or the timing of material cash inflows, if any, from our product candidates. Our business, financial condition and results of operations may be materially adversely affected by any delays in, or termination of, our clinical trials or a determination by the FDA that the results of our trials are inadequate to justify regulatory approval, insofar as cash in-flows from the relevant drug or program would be delayed or would not occur.

Results of Operations

We anticipate that our results of operations will fluctuate for the foreseeable future due to several factors, such as the progress of our research and development efforts and the timing and outcome of regulatory submissions. Due to these uncertainties, accurate predictions of future operations are difficult or impossible to make.

Three Months Ended June 30, 2019 Compared to Three Months Ended June 30, 2018

Research and Development Expenses. Research and development expenses for the three months ended June 30, 2019 were $3.6 million, a decrease of $0.5 million, or 12%, from $4.1 million for the three months ended June 30, 2018. This decrease is predominately due to timing of development milestones related to the PTSD HONOR study in 2018, which resulted in a $0.8 million increase in clinical expenses in 2018. Offsetting this decrease, is an increase in non-clinical of $0.2 million in 2019 related to our development pipeline.

General and Administrative Expenses. General and administrative expenses for the three months ended June 30, 2019 were $2.4 million, an increase of $0.3 million, or 14%, from $2.1 million incurred in the three months ended June 30, 2018. The increase in primarily due to an increase in legal fees of $0.1 million due to increased patent prosecution costs and an increase in insurance expenses of $0.2 million due to higher premiums in 2019.

Net Loss. As a result of the forgoing, the net loss for the three months ended June 30, 2019 was $5.8 million, compared to a net loss of $6.1 million for the three months ended June 30, 2018.

Six Months Ended June 30, 2019 Compared to Six Months Ended June 30, 2018

Research and Development Expenses. Research and development expenses for the six months ended June 30, 2019 were $7.5 million, a decrease of $1.7 million, or 18%, from $9.2 million for the six months ended June 30, 2018. This decrease is predominately due to a pharmacokinetic bridging study of TNX-102 SL that was conducted in the first quarter of 2018 and due to the ramp-up of development work related to the PTSD HONOR study in 2018. Offsetting the decrease is an increase in manufacturing expenses of $0.5 million, period over period, due to TNX-601 formulation work in 2019.

General and Administrative Expenses. General and administrative expenses for the six months ended June 30, 2019 were $4.8 million, an increase of $0.9 million, or 23%, from $3.9 million incurred in the six months ended June 30, 2018. The increase in primarily due to an increase in legal fees of $0.1 million due to increased patent prosecution costs, an increase in investor and public relations expenses of $0.1 million due to increased investor meetings and an increase in insurance expenses of $0.4 million due to higher premiums in 2019.

Net Loss. As a result of the foregoing, the net loss for the six months ended June 30, 2019 was $12.1 million, compared to a net loss of $13.0 million for the six months ended June 30, 2018.

License Agreement with Columbia University

On May 20, 2019, we entered into an exclusive License Agreement (the "License Agreement") with the Trustees of Columbia University in the City of New York ("Columbia") pursuant to which Columbia, for itself and on behalf of the University of Kentucky and the University of Michigan (collectively, the "Institutions") granted us an exclusive license, with the right to sublicense, certain patents, technical information and material (collectively, the "Technology") related to a double-mutant cocaine esterase, and to develop and commercialize products thereunder (each, a "Product"). Pursuant to the terms of the License Agreement, Columbia has reserved for itself and the Institutions the right to practice the Technology for academic research and educational purposes.

We have agreed to pay a six-digit license fee to Columbia as consideration for entering into the License Agreement. We are obligated to use Commercially Reasonable Efforts, as defined in the License Agreement, to develop and commercialize the Product, and to achieve specified developmental milestones. The first 50% of the license fee was paid by June 30, 2019, while the remaining 50% license fee has been accrued for within accrued expenses and other current liabilities as of June 30, 2019.

We have agreed to pay Columbia single-digit royalties on net sales of (i) Products sold by us or a sublicensee and (ii) any other products that involve material or technical information related to the Product and transferred to us pursuant to the License Agreement ("Other Products") sold by us or a sublicensee. Royalties on each particular Product are payable on a country-by-country and Product-by-Product basis until the latest of (i) the date of expiration of the last valid claim in the last to expire of the issued patents covered by the License Agreement, (ii) a specified period of time after the first commercial sale of a Product in the country in question, or (iii) expiration of any market exclusivity period granted by a regulatory agency. Royalties on each particular Other Product are payable on a country-by-country and product-by-product basis until the later of (i) a specified period of time after the first commercial sale of such particular Other Product in such country or (ii) expiration of any market exclusivity period granted by a regulatory agency. Royalties payable on net sales of the Product and Other Products may be reduced by 50% of the royalties payable by us to any third party for intellectual property rights which are necessary for the practice of the rights licensed to us under the License Agreement, provided that the royalty payable on a Product or Other Product may not be reduced by more than 50%.

We are also obligated to make contingent milestone payments to Columbia totaling $3 million on a Product-by-Product basis upon the achievement of certain development, approval and sales milestones related to a Product. In addition, we shall pay Columbia 5% of consideration, other than royalty payments and certain other categories of consideration, payable to us by a sublicensee. As of June 30, 2019, no milestone payments have been accrued or paid in relation to this agreement.

Liquidity and Capital Resources

As of June 30, 2019, we had working capital of $12.1 million, comprised primarily of cash and cash equivalents of $12.2 million and prepaid expenses and other of $2.0 million, which was offset by $1.0 million of accounts payable, $0.6 million of accrued expenses and other current liabilities and $0.4 million of current operating lease liabilities. A significant portion of the accounts payable and accrued expenses are due to work performed in relation to our ongoing Phase 3 RECOVERY study of TNX-102 SL for the treatment of PTSD. For the six months ended June 30, 2019 and 2018, we used approximately $13.4 million and $12.3 million of cash in operating activities, respectively, which represents cash outlays for research and development and general and administrative expenses in such periods. The increase in cash used in operations is due primarily to non-recurring items including close-out costs for the Phase 3 HONOR study and start-up costs related to the current Phase 3 RECOVERY study incurred during the first quarter of 2019. Additionally, the Company's annual insurance premiums also increased over the prior year, the payments for which all occur in the first quarter. For the six months ended June 30, 2019, net proceeds from financing activities were from the sale of our common stock of approximately $0.4 million and approximately $70,000 through the exercise of warrants into common stock. In the comparable 2018 period, approximately $3.5 million was raised through the sale of shares of common stock.

Cash used by investing activities for the six months ended June 30, 2019 and 2018, was $10,000 and $4,000 respectively, related to the purchase of property and equipment.

July 2019 Financing

On July 16, 2019, we entered into an underwriting agreement with Aegis Capital Corp., as representatives of the underwriters (the "Underwriters"), relating to the issuance and sale of 9,000,000 shares of our common stock, in an underwritten public offering (the "July 2019 Financing"). The public offering price for each share of common stock was $0.60. We granted the Underwriters a 45-day option to purchase up to an additional 1,350,000 shares of common stock to cover over-allotments, if any.

The July 2019 Financing closed on July 18, 2019. The Underwriters purchased the shares at an eight percent discount to the then current public price, for an aggregate discount of $0.4 million (or $0.048 per share). We incurred offering expenses to-date of approximately $0.2 million. We received net proceeds of approximately $4.8 million.

2018 At-the-Market Offering

On May 1, 2018, we entered into a sales agreement (the "Sales Agreement"), with Cowen and Company, LLC., ("Cowen"), pursuant to which we may issue and sell, from time to time, shares of our common stock having an aggregate offering price of up to $9.5 million in at-the-market offerings ("ATM") sales. On the same day, we filed a prospectus supplement under its existing shelf registration relating to the Sales Agreement. Cowen acted as sales agent and was paid a 3% commission on each sale under the Sales Agreement. Our common stock was sold at prevailing market prices at the time of the sale, and, as a result, prices varied.

During the six months ended June 30, 2019, we sold an aggregate of 21,052 shares of common stock under the ATM for net proceeds of approximately $33,000.

During the quarter ended June 30, 2018, we sold an aggregate of 35,910 shares of common stock using the ATM, resulting in net proceeds of $1.6 million, net of expenses of approximately $50,000 of Cowen's commission.

2018 Lincoln Park Transaction

On October 18, 2018, we entered into a purchase agreement (the "2018 Purchase Agreement") and a registration rights agreement (the "2018 Registration Rights Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"). Pursuant to the terms of the 2018 Purchase Agreement, Lincoln Park has agreed to purchase from us up to $15,000,000 of our common stock (subject to certain limitations) from time to time during the term of the 2018 Purchase Agreement. Pursuant to the terms of the 2018 Registration Rights Agreement, we filed with the SEC a registration statement to register for resale under the Securities Act the shares that have been or may be issued to Lincoln Park under the 2018 Purchase Agreement.

Pursuant to the terms of the 2018 Purchase Agreement, at the time we signed the 2018 Purchase Agreement and the 2018 Registration Rights Agreement, we issued 35,000 shares of common stock to Lincoln Park as consideration for its commitment to purchase shares of our common stock under the 2018 Purchase Agreement. The commitment shares were valued at $245,000 and recorded as an addition to equity for the issuance of the common stock and treated as a reduction to equity as a cost of capital to be raised under the 2018 Purchase Agreement.

During the six months ended June 30, 2019, we sold an aggregate of approximately 227,000 shares of common stock under the 2018 Purchase Agreement, for gross proceeds of approximately $0.4 million.

Under applicable rules of the NASDAQ Global Market, we could not issue or sell more than 19.99% of the shares of our common stock outstanding immediately prior to the execution of the 2018 Purchase Agreement (approximately 262,000 shares) to Lincoln Park under the 2018 Purchase Agreement without stockholder approval, unless the average price of all applicable sales of our common stock to Lincoln Park under the 2018 Purchase Agreement equals or exceeds a threshold amount. As we have issued approximately 262,000 shares to Lincoln Park, by June 30, 2019, under the 2018 Purchase Agreement at less than the threshold amount, we will not sell any additional shares under the 2018 Purchase Agreement without shareholder approval.

2017 Lincoln Park Transaction

On September 28, 2017, the Company entered into a purchase agreement (the "2017 Purchase Agreement") and a registration rights agreement (the "Registration Rights Agreement") with Lincoln Park Capital Fund, LLC ("Lincoln Park"). Pursuant to the terms of the 2017 Purchase Agreement, Lincoln Park has agreed to purchase from the Company up to $15,000,000 of its common stock (subject to certain limitations) from time to time during the term of the 2017 Purchase Agreement. Pursuant to the terms of the Registration Rights Agreement, the Company filed with the SEC a registration statement to register for resale under the Securities Act the shares that have been or may be issued to Lincoln Park under the 2017 Purchase Agreement.

Pursuant to the terms of the 2017 Purchase Agreement, at the time the Company signed the 2017 Purchase Agreement and the Registration Rights Agreement, the Company issued 7,304 shares of common stock to Lincoln Park as consideration for its commitment to purchase shares of its common stock under the 2017 Purchase Agreement. The commitment shares were valued at $300,000, recorded as an addition to equity for the issuance of the common stock and treated as a reduction to equity as a cost of capital to be raised under the 2017 Purchase Agreement.

During the six months ended June 30, 2018, we sold an aggregate of approximately 63,000 shares of common stock under the 2017 Purchase Agreement, for net proceeds of approximately $1.8 million, net of expenses of approximately $45,000.

Under applicable rules of the NASDAQ Global Market, we could not issue or sell more than 19.99% of the shares of our common stock outstanding immediately prior to the execution of the 2017 Purchase Agreement (approximately 150,000 shares) to Lincoln Park under the 2017 Purchase Agreement without stockholder approval, unless the average price of all applicable sales of our common stock to Lincoln Park under the 2017 Purchase Agreement equals or exceeds a threshold amount. As we had issued approximately 150,000 shares to Lincoln Park, by December 31, 2018, under the 2017 Purchase Agreement at less than the threshold amount, we will not sell any additional shares under the 2017 Purchase Agreement without shareholder approval.

Future Liquidity Requirements

We expect to incur losses from operations for the near future. We expect to incur increasing research and development expenses, including expenses related to additional clinical trials. We will not have enough resources to meet our operating requirements for the one-year period from filing date of this report.

Our future capital requirements will depend on a number of factors, including the progress of our research and development of product candidates, the timing and outcome of regulatory approvals, the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims and other intellectual property rights, the status of competitive products, the availability of financing and our success in developing markets for our product candidates.

We will need to obtain additional capital in order to fund future research and development activities. Future financing may include the issuance of equity or debt securities, obtaining credit facilities, or other financing mechanisms. Even if we are able to raise the funds required, it is possible that we could incur unexpected costs and expenses, fail to collect significant amounts owed to us, or experience unexpected cash requirements that would force us to seek alternative financing. Furthermore, if we issue additional equity or debt securities, shareholders may experience additional dilution or the new equity securities may have rights, preferences or privileges senior to those of existing holders of our common stock.

If additional financing is not available or is not available on acceptable terms, we may be required to delay, reduce the scope of or eliminate our research and development programs, reduce our commercialization efforts or obtain funds through arrangements with collaborative partners or others that may require us to relinquish rights to certain product candidates that we might otherwise seek to develop or commercialize independently.

Stock Compensation

Stock Options

On June 8, 2018, our stockholders approved the Tonix Pharmaceuticals Holding Corp. 2018 Stock Incentive Plan (the "2018 Plan"). The 2018 Plan provided for the issuance of up to 132,000 shares of common stock. With the adoption of the 2019 Plan (as defined below), no further grants may be made under the 2018 Plan.

On May 3, 2019, our stockholders approved the Tonix Pharmaceuticals Holding Corp. 2019 Stock Incentive Plan (the "2019 Plan").

Under the terms of the 2019 Plan, we may issue (1) stock options (incentive and nonstatutory), (2) restricted stock, (3) SARs, (4) RSUs, (5) other stock-based awards, and (6) cash-based awards. The 2018 Plan provides for the issuance of up to 1,400,000 shares of common stock, which amount will be increased to the extent that awards granted under the 2019 Plan and the Plans are forfeited, expire or are settled for cash (except as otherwise provided in the 2019 Plan). The Board of Directors determines the exercise price, vesting and expiration period of the grants under the 2019 Plan. However, the exercise price of an incentive stock option may not be less than 110% of fair value of the common stock at the date of the grant for a 10% or more shareholder and 100% of fair value for a grantee who is not a 10% shareholder. The fair value of the common stock is determined based on quoted market price or in absence of such quoted market price, by the Board of Directors in good faith. Additionally, the expiration period of grants under the 2019 Plan may not more than ten years. As of June 30, 2019, 558,300 shares were available for future grants under the 2019 Plan.

The weighted average fair value of options granted during the three and six months ended 2019 was $1.65 per share and $1.67 per share, respectively. The weighted average fair value of options granted during the three and six months ended 2018 was $32.93 per share and $28.07 per share, respectively.

We measure the fair value of stock options on the date of grant, based on the Black Scholes option pricing model using certain assumptions discussed in the following paragraph, and the closing market price of our common stock on the date of the grant. For employees and directors, the fair value of the award is measured on the grant date and for non-employees, the fair value of the award is generally re-measured on vesting dates and interim financial reporting dates until the service period is complete. Most stock options granted pursuant to the Plans typically vest 1/3rd 12 months from the date of grant and 1/36th each month thereafter for 24 months and expire ten years from the date of grant. In addition, we issue options to directors which vest over a one-year period. In addition, we also issue performance-based options to executive officers, which options vest when the target parameters are met, subject to a one year minimum service period prior to vesting. Stock-based compensation expense related to awards is amortized over the applicable vesting period using the straight-line method.

Stock-based compensation expense relating to options granted of $0.4 million and $0.7 million was recognized for the three and six-month periods ended June 30, 2019, respectively, and $0.4 million and $0.8 million was recognized for the three and six-month periods ended June 30, 2018, respectively.

As of June 30, 2019, we had approximately $2.5 million of total unrecognized compensation cost related to non-vested awards granted under the Plans, which we expect to recognize over a weighted average period of 2.03 years.

Employee Stock Purchase Plan

On May 3, 2019, the Company's stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2019 Employee Stock Purchase Plan (the "2019 ESPP"). As a result of adoption of the 2019 ESPP by the stockholders, no further grants may be made under the Tonix Pharmaceuticals Holdings Corp. 2018 Employee Stock Purchase Plan ("2018 ESPP").

The 2019 ESPP allows eligible employees to purchase up to an aggregate of 150,000 shares of the Company's common stock. Under the 2019 ESPP, on the first day of each offering period, each eligible employee for that offering period has the option to enroll for that offering period, which allows the eligible employees to purchase shares of the Company's common stock at the end of the offering period. Each offering period under the 2019 ESPP is for six months, which can be modified from time-to-time. Subject to limitations, each participant will be permitted to purchase a number of shares determined by dividing the employee's accumulated payroll deductions for the offering period by the applicable purchase price, which is equal to 85 percent of the fair market value of our common stock at the beginning or end of each offering period, whichever is less. A participant must designate in his or her enrollment package the percentage (if any) of compensation to be deducted during that offering period for the purchase of stock under the 2019 ESPP, subject to the statutory limit under the Code. As of June 30, 2019, 150,000 shares were available for future grants under the 2019 ESPP.

The 2019 ESPP and 2018 ESPP are considered compensatory plans with the related compensation cost written off over the six-month offering period. The compensation expense related to the 2019 ESPP for the six months ended June 30, 2019 and 2018 was $24,000 and $0, respectively. As of December 31, 2018, approximately $38,000 of employee payroll deductions, which have been withheld since July 1, 2018, the commencement of the offering period ending December 31, 2018, are included in accrued expenses in the accompanying balance sheet. In January 2019, 1,758 shares that were purchased as of December 31, 2018, were issued under the 2018 ESPP, and approximately $3,000 of employee payroll deductions accumulated at December 31, 2018, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $35,000 was returned to the employees. As of June 30, 2019, approximately $45,000 of employee payroll deductions, which have been withheld since January 1, 2019, the commencement of the offering period ending June 30, 2019, are included in accrued expenses in the accompanying balance sheet. In August 2019, 23,792 shares that were purchased as of June 30, 2019, were issued under the 2019 ESPP, and approximately $29,000 of employee payroll deductions accumulated at June 30, 2019, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $16,000 will be returned to the employees in Q3 2019.

Restricted Stock Units

In May 2017, a total of 563 RSUs vested that were granted to our non-employee directors for board services in 2016, in lieu of cash, with a one-year vesting from the grant date and a fair value of $229 at the date of grant. 488 shares of the Company's common stock were issued upon the vesting of such RSU's during the year ended December 31, 2017. The remaining 75 shares of common stock were issued during the three months ended March 31, 2018.

During the six months ended June 30, 2019 and 2018, no stock-based compensation expense related to RSU grants was expensed.

Commitments

Research and development contracts

We have entered into contracts with various contract research organizations with outstanding commitments aggregating approximately $7.7 million at June 30, 2019 for future work to be performed.

Operating leases

As of June 30, 2019, future minimum lease payments are as follows (in thousands):

Year Ending December 31,	
2019	$ 228
2020	360
2021	6
	$ 594

Critical Accounting Policies and Estimates

Our discussion and analysis of our financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities and expenses. We evaluate our estimates and judgments on an ongoing basis. We base our estimates on historical experience and on assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

We believe the following critical accounting policies affect our more significant judgments and estimates used in the preparation of our consolidated financial statements.

Leases. The Company determines if an arrangement is a lease at inception. Operating leases are included in operating lease right-of-use ("ROU") assets, other current liabilities and operating lease liabilities in the Company's consolidated balance sheets. ROU assets represent the Company's right to use an underlying asset for the lease term and lease liabilities represent its obligation to make lease payments arising from the lease. Operating lease ROU assets and liabilities are recognized at commencement date based on the present value of lease payments over the lease term. As the Company's leases do not provide an implicit rate, the Company uses an incremental borrowing rate based on the information available at commencement date in determining the present value of lease payments. This is the rate the Company would have to pay if borrowing on a collateralized basis over a similar term to each lease. The operating lease ROU asset also includes any lease payments made and excludes lease incentives. The Company's lease terms may include options to extend or terminate the lease when it is reasonably certain that the Company will exercise that option. Lease expense for lease payments is recognized on a straight-line basis over the lease term.

Research and Development. We outsource our research and development efforts and expense the related costs as incurred, including the cost of manufacturing product for testing, licensing fees and costs associated with planning and conducting clinical trials. The value ascribed to patents and other intellectual property acquired was expensed as research and development costs, as it related to particular research and development projects and had no alternative future uses.

We estimate our accrued expenses. Our clinical trial accrual process is designed to account for expenses resulting from our obligations under contracts with vendors, consultants and clinical research organizations and clinical site agreements in connection with conducting clinical trials. The financial terms of these contracts are subject to negotiations, which vary from contract to contract and may result in payment flows that do not match the periods over which materials or services are provided to us under such contracts. We account for trial expenses according to the progress of the trial as measured by participant progression and the timing of various aspects of the trial. We determine accrual estimates that take into account discussions with applicable personnel and outside service providers as to the progress or state of completion of trials, or the services completed. During the course of a clinical trial, we adjust our clinical expense recognition if actual results differ from our estimates. We make estimates of our accrued expenses as of each balance sheet date based on the facts and circumstances known to us at that time. Our clinical trial accruals and prepaid assets are dependent upon the timely and accurate reporting of contract research organizations and other third-party vendors.

Stock-Based Compensation. All stock-based payments to employees and to nonemployee directors for their services as directors consisted of grants of restricted stock and stock options, which are measured at fair value on the grant date and recognized in the condensed consolidated statements of operations as compensation expense over the relevant vesting period. Restricted stock payments to nonemployees are recognized as an expense over the period of performance. Such payments are measured at fair value at the earlier of the date a performance commitment is reached or the date performance is completed. In addition, for awards that vest immediately and are nonforfeitable, the measurement date is the date the award is issued.

Recent Accounting Pronouncements

In February 2016, the FASB established ASC Topic 842, Leases (Topic 842), by issuing ASU No. 2016-02, which requires lessees to recognize leases on-balance sheet and disclose key information about leasing arrangements. The new standard establishes a right-of-use (ROU) model that requires a lessee to recognize a ROU asset and lease liability on the balance sheet. Leases will be classified as finance or operating, with classification affecting the pattern and classification of expense recognition in the statement of operations. We adopted the new standard on January 1, 2019.

The new standard provides a number of optional practical expedients in transition. We have elected the 'package of practical expedients', which permit us not to reassess under the new standard its prior conclusions about lease identification, lease classification and initial direct costs. We did not elect the use-of-hindsight or the practical expedient pertaining to land easements; the latter is not applicable to us.

The new standard has had a material effect on our financial statements. The most significant effects of adoption relate to (1) the recognition of new ROU assets and lease liabilities on its balance sheet for real estate operating leases; and (2) providing significant new disclosures about its leasing activities.

The new standard also provides practical expedients for an entity's ongoing accounting. We elected the short-term lease recognition exemption for all leases that qualify. This means, for those leases that qualify, we will not recognize ROU assets or lease liabilities, and this includes not recognizing ROU assets or lease liabilities for existing short-term leases of those assets in transition. Beginning in 2019, we expect changes to our disclosed lease recognition policies and practices, as well as to other related financial statement disclosures due to the adoption of this standard. The standard did not have a material impact on the Company's results of operations or liquidity.

Upon adoption, we recognized operating lease liabilities of approximately $0.3 million based on the present value of the remaining minimum rental payments under current leasing standards for existing operating leases. We recognized corresponding ROU assets of approximately $0.3 million.

Off-Balance Sheet Arrangements

Other than contractual obligations incurred in the normal course of business, we do not have any off-balance sheet financing arrangements or liabilities, guarantee contracts, retain or contingent interests in transferred assets or any obligation arising out of a material variable interest in an unconsolidated entity.

ITEM 3 – QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Not required under Regulation S-K for "smaller reporting companies."

ITEM 4 - CONTROLS AND PROCEDURES

Evaluation of disclosure controls and procedures.

Our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures pursuant to Rule 13a-15 under the Securities Exchange Act of 1934 as of the end of the period covered by this Quarterly Report on Form 10-Q. In designing and evaluating the disclosure controls and procedures, management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving the desired control objectives. In addition, the design of disclosure controls and procedures must reflect the fact that there are resource constraints and that management is required to apply its judgment in evaluating the benefits of possible controls and procedures relative to their costs.

Based on our evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of June 30, 2019, our disclosure controls and procedures are designed at a reasonable assurance level and are effective to provide reasonable assurance that information we are required to disclose in reports that we file or submit under the Exchange Act is recorded, processed, summarized, and reported within the time periods specified in SEC rules and forms, and that such information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure.

Changes in internal control over financial reporting.

There were no changes in our internal control over financial reporting that occurred during the quarter ended June 30, 2019 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

We are currently not a party to any material legal proceedings or claims.

Item 1A. Risk Factors

Not required under Regulation S-K for "smaller reporting companies."

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

None.

Item 3. Defaults Upon Senior Securities

None.

Item 4. Mine Safety Disclosures

None.

Item 5. Other Information

None.

Item 6. Exhibits

1.01	License Agreement, dated May 20, 2019, between Tonix Pharmaceuticals Holding Corp. and The Trustees of Columbia University in the City of New York†
31.01	Certification of Chief Executive Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.02	Certification of Chief Financial Officer pursuant to Exchange Act Rules 13a-14(a) and 15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.01	Certifications of Chief Executive Officer and Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
101 INS	XBRL Instance Document
101 SCH	XBRL Taxonomy Extension Schema Document
101 CAL	XBRL Taxonomy Calculation Linkbase Document
101 LAB	XBRL Taxonomy Labels Linkbase Document
101 PRE	XBRL Taxonomy Presentation Linkbase Document
101 DEF	XBRL Taxonomy Extension Definition Linkbase Document

† Certain portions of this exhibit, that are not material and would likely cause competitive harm to the registrant if publicly disclosed, have been redacted pursuant to Item 601(b)(10) of Regulation S-K.

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.

TONIX PHARMACEUTICALS HOLDING CORP.

Date: August 12, 2019

By: /s/ SETH LEDERMAN
Seth Lederman
Chief Executive Officer (Principal Executive Officer)

Date: August 12, 2019

By: /s/ BRADLEY SAENGER
Bradley Saenger
Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)

EXHIBIT 1.01

CERTAIN IDENTIFIED INFORMATION HAS BEEN EXCLUDED FROM THIS EXHIBIT BECAUSE IT IS NOT MATERIAL AND WOULD LIKELY CAUSE COMPETITIVE HARM TO THE REGISTRANT IF PUBLICLY DISCLOSED. THE OMISSIONS HAVE BEEN INDICATED BY "[***]."

EXCLUSIVE LICENSE AGREEMENT

This **Agreement** is dated May 20, 2019 (the "**Effective Date**"), and is between THE TRUSTEES OF COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK, a New York corporation ("**Columbia**"), and TONIX PHARMACEUTICALS HOLDING CORP., a Nevada corporation ("**Company**" or "**Tonix**").

WHEREAS, Columbia along with Regents of The University of Michigan ("Michigan") and The University of Kentucky Research Foundation ("Kentucky" and collectively, the "Institutions") have filed certain Patents (as defined below);

WHEREAS, pursuant to an Inter-Institutional Agreement entered into by and between Columbia and Institutions effective June 18, 2008 (the "IIA"), Institutions granted Columbia the right to negotiate and execute licenses to the Patents on their behalf; and

WHEREAS, Company wishes to obtain, and Columbia is willing to grant, an exclusive license in and to the Patents.

NOW, THEREFORE, in consideration of the mutual covenants herein contained, the parties hereby agree as follows:

1. Definitions. In this Agreement, the following definitions apply:

a. "**Affiliate**" means any corporation or other entity that directly or indirectly controls, is controlled by, or is under common control with, another corporation or entity. Control means direct or indirect ownership of, or other beneficial interest in, fifty percent (50%) or more of the voting stock, other voting interest, or income of a corporation or other entity.

b. "**Cover**" or "**Covered By**" means (i) infringes, in the case of a claim in an issued patent, or (ii) would infringe the claim if it existed in an issued patent, in the case of a claim in a pending application.

c. "**Designee**" means a corporation or other entity that is employed by, under contract to, or in partnership with (i) Company, (ii) a Sublicensee, (iii) an Affiliate of Company or (iv) an Affiliate of a Sublicensee, wherein such corporation or other entity is granted the right to make, use, sell, promote, distribute, market, import, or export Products.

d. "**Field**" means treatment in humans of cocaine overdose and any other approved acute indications.

e. "**Institutional Technical Information**" means any know-how, technical information and/or research, technical, test or development data (including, but not limited to, pre-clinical and clinical data), along with all formulations, processes, protocols, regulatory files and the like, in each case developed by Columbia and/or Institutions to the extent such know-how, technical information or data are necessary or useful for the discovery, development, manufacture, use, sale, offering for sale, importation, exportation, distribution, rental or lease of a Product, including, without limitation, (i) any know-how, technical information and data disclosed in any Patent or (ii) any reports or disclosures concerning research or inventions developed by or provided or disclosed to, or otherwise received by, Columbia and/or Institutions. Institutional Technical Information will include, but is not limited to, the information in Exhibit B hereto.

f. "**License Year**" means the one-year period from the Effective Date of this Agreement or an anniversary thereof to the next anniversary of the Effective Date.

g. "**Materials**" means the tangible physical material delivered to Company hereunder by or on behalf of Columbia, and any progeny or derivatives thereof developed by Company, its Affiliates or Sublicensees. Any Materials delivered to Company hereunder shall be listed in Exhibit B hereto.

h. "**Net Sales**" means the greater of the gross invoice or contract price charged to Third Party customers for the Product or the actual consideration paid by Third Party customers for the Product less the following deductions, in each case to the extent actually allowed and/or taken by such Third Party customer in connection with such Product ("Permitted Deductions"): (i) customary trade, quantity, or cash discounts and rebates to the extent actually taken or paid, as the case may be and administrative or other bona fide service fees related to a Product paid to any pharmacy benefit manager, group purchasing organization, distributor, wholesaler or other Third Party; (ii) amounts repaid or credited by reason of rejection or return; (iii) sales, use or value added taxes or any other taxes or other governmental charges levied on the production, sale, rental, lease or other transfer, transportation, delivery, performance or use of a Product which is paid by or on behalf of Company, Sublicensees, Designees, or any Affiliate of the foregoing; (iv) outbound transportation costs prepaid or allowed, costs of packing, and costs of insurance in transit; (v) amounts written off as bad debt consistent with the requirements of GAAP, IFRS or any other applicable accounting standard in a given country in the Territory. The intent of this definition of Net Sales is to allow Columbia to derive a royalty on the end sale of a Product to the first Third Party.

In the case of transfers of Products between any of Company, Sublicensees, Designees, and Affiliates of any of the foregoing, for subsequent sale, rental, lease or other transfer of such Products to Third Parties, Net Sales will be the greater of (i) the actual amount charged for the transfer of the Product between any of Company, Sublicensees, Designees, and Affiliates of any of the foregoing and (ii) the gross invoice or contract price charged to the Third Party customer for that Product in an arm's-length transaction, subject, in each case to the Permitted Deductions.

At Columbia's option, in the case of transfers of Products between any of Company, Sublicensees, Designees, and Affiliates of any of the foregoing, for use by Company, Sublicensees, Designees, and Affiliates of any of the foregoing such that the Product is consumed or used, and is not incorporated into a product or service subsequently sold to a Third Party customer, Net Sales means the greater of the following: (i) the actual amount charged for the transfer of the Product between any of Company, Sublicensees, Designees, and Affiliates of any of the foregoing, and (ii) what the fair market value of the Product would be in an arm's-length transaction as determined by reference to the then prevailing sales price to Third Parties, subject in each case to the Permitted Deductions.

i. "**Other Consideration"** means any and all consideration of any kind (e.g., cash or in-kind consideration) received by the Company from Sublicensees, their Designees or their Affiliates as full or partial consideration for the grant of any sublicense (or any option or any right to negotiate for a sublicense) under Section 2b of this Agreement, including, without limitation, licensing fees, lump sums, development based or non-development based milestone payments, debt and/or equity securities or instruments purchased or obtained at a premium above fair market value, but excluding (i) any consideration received for royalties on Net Sales of Products by Sublicensee (for clarity, royalties on Net Sales of Products by Sublicensees will be subject to the pass through royalty set forth in Section 4(c)(i), (ii) investments in Tonix equity to the extent such equity is purchased for fair market value; (iii) funds that are paid for direct research and development expenses on Products incurred by Tonix after the actual date of execution of the sublicense agreement and required to be incurred by Tonix under the sublicense; (iv) debt incurred by Tonix on arm's length terms; (v) fees payable to Tonix in connection with bona-fide services provided by Tonix to a Sublicensee, Designee or an Affiliate at fair market value and (v) reimbursement of out-of-pocket patent prosecution or maintenance expenses for the Patents. With respect to securities received by Tonix that would be considered "Other Consideration," the value of such securities will be set at the value of such securities on the date of the receipt by Tonix of the subject securities and Tonix has the option to pay Columbia in cash or transfer the value in the form of shares the securities.

j. "**Other Product**" means any product or service (or component thereof), other than a Patent Product, the discovery, development, manufacture, use, sale, offering for sale, importation, exportation, distribution, rental or lease of which involves the use of or incorporation, in whole or in part, of Materials or Technical Information.

k. "**Patent" or "Patents**" means the following: (i) the United States and foreign patents and/or patent applications listed in Exhibit A hereto; (ii) any non-provisional patent applications that claim priority to any provisional patent applications listed in Exhibit A hereto; (iii) any and all claims of continuation-in-part applications that claim priority to the United States patent applications listed in Exhibit A, but only where such claims are directed to inventions disclosed in the manner provided in the first paragraph of 35 U.S.C. Section 112 in the United States patent applications listed in Exhibit A, and such claims in any patents issuing from such continuation-in-part applications; (iv) any and all foreign patent applications, foreign patents or related foreign patent documents that claim priority to the patents and/or patent applications listed in Exhibit A; (v) any and all divisionals, continuations, reissues, re-examinations, renewals, substitutions, and extensions of the foregoing; and (vi) any and all patents issuing from the foregoing. Notwithstanding the preceding definition, Patent and Patents will not include any patent applications or issued patents based on research conducted after the Effective Date, except as otherwise agreed in a separate writing.

l. "**Patent Product**" means any product or service (or component thereof) the discovery, development, manufacture, use, sale, offering for sale, importation, exportation, distribution, rental or lease of which is Covered By a claim of a Patent.

m. "**Prior Licensee Technical Information**" means any know-how, technical information and/or research, technical, test or development data (including, but not limited to, pre-clinical and clinical data), along with all formulations, processes, protocols, regulatory files and the like, developed by former Third Party licensees (the "**Prior Licensees**") of the Patents in connection with Third Party license agreements ("**Third Party License Agreements**"), to the extent such know-how, technical information or data are necessary or useful for the discovery, development, manufacture, use, sale, offering for sale, importation, exportation, distribution, rental or lease of a Product, including, without limitation, (i) any know-how, technical information and data disclosed in any Patent or (ii) any reports or disclosures concerning research or inventions developed by or provided or disclosed to, or otherwise received by, Columbia and/or Institutions. Prior Licensee Technical Information will include, but is not limited to, the information in Exhibit B hereto.

n. "**Product**" or "**Products**" means a Patent Product and/or an Other Product.

o. "**Regulatory Documentation**" means all regulatory applications, registrations, licenses, authorizations and approvals (including all INDs), all correspondence submitted to or received from regulatory authorities (including minutes and official contact reports relating to any communications with any regulatory authority), and all reports and documentation in connection with pre-clinical or clinical studies and tests (including study reports and study protocols, and copies of all interim study analyses), and all data contained in any of the foregoing, including all manufacturing data, drug master files, clinical data, adverse event files and complaint files, in each case, related to a Product. A list of the Regulatory Documentation is provided on Exhibit B hereto.

p. "**Sublicensee**" means any third party to whom Company has granted a sublicense under this Agreement. An Affiliate of Company exercising rights hereunder shall not be considered a Sublicensee.

q. "**Technical Information**" means Institutional Technical Information and Prior Licensee Technical Information.

r. "**Territory**" means worldwide.

s. "**Third Party**" means any entity or person other than Company, Sublicensees, Designees, or their Affiliates.

2. License Grant.

a. Columbia grants to the Company and each Affiliate thereof, upon and subject to all the terms of this Agreement (including Section 3), the following:

(i) an exclusive license under the Patents to discover, develop, manufacture, have made, use, sell, offer to sell, have sold, import, export, distribute, rent or lease Products in the Field and throughout the Territory;

(ii) an exclusive license to use Institutional Technical Information, Prior Licensee Technical Information and Regulatory Documentation to discover, develop, manufacture, have made, use, sell, offer to sell, have sold, import, export, distribute, rent or lease Products in the Field and throughout the Territory, until such time as Institutional Technical Information is published or otherwise publicly distributed and thereafter, the license granted hereunder for such Institutional Technical Information which is published or otherwise publicly distributed and thereafter shall automatically convert to a non-exclusive license, provided however, that Columbia and its faculty and employees shall have the right to publish, disseminate or otherwise disclose the Institutional Technical Information; and

(iii) an exclusive license to use Materials to discover, develop, manufacture, have made, use, sell, offer to sell, have sold, import, export, distribute, rent or lease Products in the Field and throughout the Territory.

b. Columbia grants to Company the right to grant sublicenses on the following conditions: (i) the Sublicensee agrees to abide by and be subject to all the terms and provisions of this Agreement applicable to the Company; (ii) the Sublicensee has no further right to grant sublicenses under this Agreement; (iii) if any Sublicensee (or any entity or person acting on its behalf) initiates any proceeding or otherwise asserts any claim challenging the validity or enforceability of any Patent in any court, administrative agency or other forum, Company shall, upon written request by Columbia and to the extent permitted by applicable law, forthwith terminate the sublicense agreement with such Sublicensee, and the sublicense agreement provides for such right of termination by Company; (iv) the sublicense agreement provides that, in the event of any inconsistency between the sublicense agreement and this Agreement, this Agreement controls; (v) the Sublicensee submits quarterly reports to Company consistent with the reporting provision of Section 5a herein; (vi) Company remains fully liable for the performance of its and its Sublicensee's obligations hereunder; (vii) Company notifies Columbia of any proposed grant of a sublicense and provides to Columbia, upon request, an unredacted copy of any proposed sublicense agreement at least seven (7) business days before execution of the sublicense in the form such sublicense agreement exists at such time, which for clarity, may be updated due to negotiation between Company and the relevant third party in the intervening period; (viii) no such sublicense or attempt to obtain a sublicensee relieves Company of its obligations under Section 6 to exercise its own commercially reasonable efforts, directly or through a sublicense, to discover, develop and market Products, nor relieve Company of its obligations to pay Columbia any and all license fees, royalties and other payments due under the Agreement, including but not limited to under Sections 4, 5 and 11 of the Agreement; (ix) Columbia is a third-party beneficiary of such sublicense, entitled to enforce it in accordance with its terms; and (x) Columbia has no liability of any kind or manner to such sublicensee except as may be set forth in Section 16(e).

c. All rights and licenses granted by Columbia to Company under this Agreement are subject to (i) any limitations imposed by the terms of any government grant, government contract or government cooperative agreement applicable to the technology that is the subject of this Agreement, and (ii) applicable requirements of 35 U.S.C. Sections 200 et seq., as amended, and implementing regulations and policies. Without limitation of the foregoing, the Company agrees that, to the extent required under 35 U.S.C. Section 204, any Product used, sold, distributed, rented or leased by Company, Sublicensees, Designees, and their Affiliates in the United States will be manufactured substantially in the United States. In addition, the Company agrees that, to the extent required under 35 U.S.C. Section 202(c)(4), the United States government is granted a non-exclusive, non-transferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States any Patent throughout the world.

d. All rights not granted to Tonix herein are reserved to Columbia and Institutions. Except as expressly provided under this Section 2, no right or license is granted (expressly or by implication or estoppel) by Columbia and Institutions to Company or its Affiliates or Sublicensees under any tangible or intellectual property, materials, patent, patent application, trademark, copyright, trade secret, know-how, technical information, data or other proprietary rights.

e. During the term of this Agreement, Columbia and Company agree to take into consideration the principle of "Global Social Responsibility" in performing the various activities contemplated under this Agreement. "**Global Social Responsibility**" means facilitating the availability of (Licensed) Products in "Developing Countries" at locally affordable prices, under reasonable circumstances and terms to improve access to such Products in such countries. "**Developing Countries**" means those countries listed by the World Bank as "**Low-Income Economies**," as such list may change from time to time. Solely by way of example, the Parties may mutually agree to revise royalty rates, adjust fair market value, consider non-monetary consideration, and/or develop patent strategies in support of each party's dedication to Global Social Responsibility.

f. [***]

g. Within ten (10) business days after the Effective Date, Columbia will execute, or cause to be executed and delivered to the FDA, an FDA transfer letter in form and substance reasonably acceptable to Company with respect to the IND included in the Regulatory Documentation and will deliver to the Company all data, files, documents or other information included within the Regulatory Documentation and/or the Technical Information.

h. Within ten (10) business days of the Effective Date, Columbia will transfer or cause to be transferred to Company the Technical Information and the Regulatory Documentation.

h. Within thirty (30) calendar days of the Effective Date, Columbia will transfer or cause to be transferred to Company, or its designee. Certain of the Materials will be generated by Columbia for Company, at Company's request. With respect to Materials stored at CROs, Columbia will provide such CROs with a letter transferring ownership or access to the Materials to Tonix.

3. Reservation of Rights for Research Purposes; Freedom of Publication.

a. Columbia and Institutions reserve the right to practice the Patents and to use Materials, to the extent Patents and Materials are exclusively licensed hereunder, for academic research and educational purposes in the Field and to permit other entities or individuals to practice and use such Patents and Materials for academic research and educational purposes in the Field. Columbia shall obtain from all entities or individuals who are given permission to practice and use such Patents and Materials an agreement in writing to limit such use to academic research and educational purposes. Nothing in this Agreement will be interpreted to limit in any way the right of Columbia and Institutions and their faculty or employees to practice and use such Patents and Materials for any purpose outside the Field or to license or permit such use outside the Field by Third Parties.

b. Company acknowledges that Columbia and Institutions are dedicated to free scholarly exchange and to public dissemination of the results of its scholarly activities. Columbia, Institutions and their faculty and employees may publish, disseminate or otherwise disclose any information relating to its research activities, including Institutional Technical Information.

4. Fees, Royalties and Payment.

a. **Importance of Technical Information and Materials.** Company has requested, and Columbia has agreed, to grant certain rights to Technical Information and Materials. Company requires these rights to develop and commercialize the technology licensed hereunder. Because of the importance of Technical Information and Materials, Company has agreed to pay certain royalties to Columbia on Other Products, as specified below, even if such Other Product is not Covered By a Patent, to obtain rights to Technical Information and Materials. Company has agreed to these payments because of the commercial value of Technical Information and Materials, separate and distinct from the commercial value of the Patents. Company acknowledges that it would not have entered into this Agreement without receiving the rights to the Technical Information and Materials specified in Section 2. Company further acknowledges that licenses to Technical Information, Materials, and each patent and application within the definition of Patents were separately available from a license to the Patents and that, for convenience and because of the preference of Company, the parties executed a combined license to the Patents, Technical Information, and Materials.

b. In consideration of the licenses granted under Section 2a of this Agreement, the Company shall pay to Columbia as follows:

(i) **License Fee:** A nonrefundable, non-recoverable and non-creditable license fee in the sum of $[***], payable as follows: (1) $[***] within 30 days of execution of this Agreement, and (2) $[***] on the first (1st) anniversary of the Effective Date; and

(ii) **Royalties:**

(A) With respect to sales of Products by Company, its Designees or their Affiliates (but not Sublicensees or their Designees, which are contemplated by (c) below), in the Territory, a nonrefundable and non-recoverable royalty of the following:

(1) [***]% of Net Sales of Patent Products; and

(2) [***]% of Net Sales of Other Products.

(B) In the event Company or its Affiliate enters into a license agreement with a Third Party for intellectual property rights which are necessary for the practice of the intellectual property licensed to Tonix hereunder, including but not limited to, in connection with the manufacture or sale of Products (the "Third Party Licensed Rights"), then Company may deduct from the royalties due to Columbia on Products, fifty percent (50%) of royalties actually paid to such Third Parties during a given calendar quarter as consideration solely for any such Third Party Licensed Rights, provided that in no event shall the royalties for Products due to Columbia for a given calendar quarter be reduced to less than [***]% of Net Sales on Patent Products and [***]% of Net Sales on Other Products.

c. In consideration of Company's right to sublicense to Third Parties granted under Section 2b of this Agreement, Company shall pay to Columbia the following nonrefundable, non-recoverable and non-creditable amounts:

(i) **Royalties:** With respect to sales of Products by Sublicensees, their Designees or their Affiliates, in the Territory, a nonrefundable and non-recoverable royalty of (A) [***]% on Net Sales of Patent Products and (B) [***]% on Net Sales of Other Products.

(ii) **Other Payments:** [***]% of Other Consideration.

d. **Development Milestone Payments.** If the Company, Sublicensees, or their Affiliates (collectively "**Developer**") develops a Product for potential commercial sale in the Territory, Company shall pay Columbia within ninety (90) days of the occurrence of any of the following events the following nonrefundable, non-recoverable and non-creditable milestone payments with respect to each and every such Product as follows:

(i) [***];
(ii) [***]; and
(iii) [***].

Each of the following milestone payments will be payable once, on a Product-by-Product basis, in connection with the first achievement of the applicable milestone by a Product developed under this Agreement.

[***]

e. **Duration of Other Product Royalties.** Royalties on each particular Other Product are payable on a country-by-country and product-by-product basis until the later of (i) fifteen (15) years after the first bona fide commercial sale of such particular Other Product in such country or (ii) expiration of any market exclusivity period granted by a regulatory agency.

f. **Highest Royalty Due.** If a Product is covered by both the definition of Patent Product and Other Product, Company shall pay Columbia the Patent Product royalty rate on the Product. Company will not be obligated to pay Columbia more than one royalty payment on the same Product sale under Section 4. To the extent that a Product ceases being a Patent Product but is still an Other Product, Company shall pay Columbia the Other Product royalty rate on the Product, but only for such time as specified in Section 4(e). By way of example, but not by way of limitation, if the manufacture of a Product is Covered by the claim of a Patent, and the manufacture of that Product also incorporates in part Technical Information, Company must pay the royalty specified in Section 4b(ii)(A)(1). If, after some period of time (for example, five years) of paying the royalties specified in Section 4b(ii)(A)(1) on the Product, the Product ceases to be a Patent Product, Company shall continue to pay royalties on the Product under Section 4b(ii)(A)(2) for the duration specified in Section 4(e) measured from the first bona fide commercial sale of the Patent Product on a country-by-country and product-by-product basis.

g. **No Non-Monetary Consideration.** Without Columbia's prior written consent, Company, Sublicensees, Designees, and Affiliates of the foregoing, shall not solicit or accept any consideration for the sale of any Product other than as will be accurately reflected in Net Sales. Furthermore, Company shall not enter into any transaction with any Affiliate that would circumvent its monetary or other obligations under this Agreement.

h. **Rate Adjustment on Challenge; Payment of Costs and Expenses.**

(i) If Company (or any entity or person acting on its behalf or at its direction) initiates any proceeding or otherwise asserts any claim challenging the validity or enforceability of any Patent in any court, administrative agency or other forum ("**Challenge**"), all royalty rates, minimum royalties, and other payment rates in Sections 4b(iii) and 4c are automatically doubled on and after the date of such challenge for the remaining term of this Agreement.

(ii) Company shall pay all costs and expenses incurred by Columbia (including actual attorneys' fees) in connection with defending a Challenge. Columbia may bill Company on a quarterly basis with respect to such costs and expenses, and Company shall make payment no later than thirty (30) days after receiving an invoice from Columbia.

(iii) If at least one claim of a Patent that is subject to a Challenge survives the Challenge by not being found invalid or unenforceable, regardless of whether the claim is amended as part of the Challenge, all royalty rates, minimum royalties, and other payment rates in Sections 4b(iii) and 4c are automatically trebled on and after the date of such finding for the remaining term of this Agreement.

Company acknowledges and agrees that the provisions in this Section 4h reasonably reflect the value derived from the Agreement by Company in the event of a Challenge. In addition, Company acknowledges and agrees that any payments made under this Section 4h are nonrefundable and non-recoverable for any reason whatsoever.

i. **Sale Below Fair Market Value.** If Company, Sublicensees, Designees or their Affiliates sell Product to a Third Party to whom it also sells other products, the Company shall not sell the Product such that Net Sales is below fair market value with the intent of increasing market share for other products sold by Company, Sublicensees, Designees or their Affiliates to such Third Party for the purpose of reducing the amount of royalties payable on the Net Sales of Product. If the sale of Product under such circumstances results in Net Sales below the fair market value of Product, then the Net Sales of Product in such transaction is deemed to be the fair market value (as determined in accordance with the last paragraph of the definition of "Net Sales") for purposes of calculating payments owed to Columbia under this Agreement.

5. Reports and Payments.

a. No later than thirty (30) days after the first business day of each calendar quarter of each License Year of this Agreement after the first commercial sale of a Product and/or an Other Product, as applicable, Company shall submit to Columbia a written report with respect to the preceding calendar quarter (the "**Payment Report**") that includes the following:

(i) Gross and Net Sales of Products by Company, Sublicensees, Designees and their Affiliates during such quarter, together with detailed information sufficient to permit Columbia to verify the accuracy of reported Net Sales, including Product names, country where manufactured, country where sold, actual selling price, units sold, an identification of all Patent claims that any Patent Product is Covered By, and an identification of Materials and Technical Information used or incorporated in the discovery, development, manufacture, use, sale, offering for sale, importation, exportation, distribution, rental or lease of any Other Product;

(ii) Amounts accruing to, and amounts received by, Company from its Sublicensees during such quarter together with the respective payment reports received by Company from any Sublicensees;

(iii) A calculation under Section 4 of the amounts due to Columbia, making reference to the applicable subsection thereof;

(iv) The exact date of the first commercial sale of a Product in the first Payment Report for such Product; and

(v) An unredacted copy of each report any Sublicensee has sent to Company that is pertinent to any royalties or other sums owing to Company for the preceding quarter.

b. Simultaneously with the submission of each Payment Report, Company shall make payments to Columbia of the amounts due for the calendar quarter covered by the Payment Report. Company shall pay by check payable to The Trustees of Columbia University in the City of New York and sent to the following address:

The Trustees of Columbia University in the City of New York
Columbia Technology Ventures
P.O. Box 1394
New York, NY 10008-1394

or to such other address as Columbia may specify by notice hereunder, or if requested by Columbia, by wire transfer of immediately available funds by Company to:

Wells Fargo
375 Park Avenue, 6th Floor
MAC J0127-063
New York, NY 10152
(This is the bank's address, not Columbia University's.
Do not use this address for correspondence to Columbia University.)
Routing #: [***]
Swift #: WFBIUS6S
Columbia Account #: [***]
Beneficiary: Columbia University FBO Tech Ventures, Finance
Other identifying info: include invoice #, contract #

or to such other bank and account identified by notice to Company by Columbia. Company shall pay for all bank charges for the wire transfer of funds for payments to Columbia and shall not the deduct bank charges from the total amount due to Columbia. Company shall send the quarterly royalty statement whether or not royalty payments are due.

c. No later than ninety (90) days after the date of termination or expiration of this Agreement, Company shall pay Columbia any and all amounts that are due under this Agreement as of the date of such termination or expiration, together with a Payment Report for such payment in accordance with Section 5, except that such Payment Report will cover the period from the end of the last calendar quarter before termination or expiration to the date of termination or expiration. Nothing in the foregoing is deemed to satisfy any of Company's other obligations under this Agreement upon termination or expiration.

d. Intentionally Omitted.

e. With respect to revenues obtained by Company in foreign countries, Company shall make royalty payments to Columbia in the United States in United States Dollars. For royalty payments for transactions outside the United States, Company shall first determine the royalties in the currency of the country in which they are earned, and then converted that currency to United States dollars using the buying rates of exchange quoted by The Wall Street Journal (or its successor) in New York, New York for the last business day of the calendar quarter in which the royalties were earned. Company shall pay any and all loss of exchange value, taxes, or other expenses incurred in the transfer or conversion of foreign currency into U.S. dollars, and any income, remittance, or other taxes on such royalties required to be withheld at the source, and shall not decrease the amount of royalties due to Columbia thereby. Royalty statements will show sales both in the local currency and US dollars, with the exchange rate used clearly stated.

f. Company shall maintain at its principal office usual books of account and records showing its actions under this Agreement, and sufficient to determine the Company's compliance with its obligations hereunder. Upon reasonable notice, but not more than once per calendar year during regular business hours, Columbia may have a certified public accountant or auditor, and an attorney (each as to whom Company has no reasonable objection and each of which has executed a non-disclosure agreement in a form reasonably acceptable to Company) inspect and copy such books and records for purposes of verifying the accuracy of the amounts paid under this Agreement. The review may cover a period of not more than three (3) years before the first day of the calendar quarter in which the review is requested. Any year that has been audited under this Section cannot subsequently be re-audited. If such a review shows the Company has underpaid by five percent (5%) or more concerning any calendar quarter then the Company shall pay, no later than ten days after a demand by Columbia, the reasonable and documented costs and expenses of such review (including the reasonable and documented fees charged by Columbia's accountant and attorney involved in the review), in addition to the amount of any underpayment and any interest thereon. The Company agrees to reasonably cooperate with Columbia's accountant or auditor and attorney in connection with any such review. During the review, the Company shall provide Columbia's accountant or auditor and attorney with all information reasonably requested to allow the accountant or auditor and attorney to audit and test for compliance with Company's obligations, including without limitation, information relating to sales, inventory, manufacturing, purchasing, transfer records, customer lists, invoices, purchase orders, sales orders, shipping documentation, third-party royalty reports, cost information, pricing policies, and agreements with third parties (including to the extent in Company's possession and control, the Sublicensees, the Designees, the Affiliates of the Company, the Sublicensees and the Designees, and the customers). Notwithstanding anything to the contrary in this Agreement (including Section 15b), and without limiting any of Columbia's rights and remedies hereunder, if any payment required hereunder that is made late (including unpaid portions of amounts due), it bears interest, compounded monthly, either at the rate of 6% per year, or in Columbia's sole discretion, at the U.S. prime rate plus 2% as published by the Wall Street Journal on the last day of the applicable billing period. If any interest charged or paid in excess of the maximum rate permitted by applicable New York State Law, the excess is hereby deemed the result of a mistake and Columbia shall credit or refund (at the Company's option) to the company the interest paid in excess of the maximum rate.

g. Company shall reimburse Columbia for any costs and expenses incurred in connection with collecting on any arrears of Company with respect to its payment and reimbursement obligations under this Agreement (such as Section 11b of this Agreement), including the costs of engaging any collection agency for such purpose.

h. Company shall submit to Columbia annual non-binding forecasts on the first business day following January 1 for annual sales of Products by Company, Sublicensees, Designees and their Affiliates to Columbia for its internal budget purposes.

6. Diligence.

a. Company shall use its Commercially Reasonable Efforts to research, discover, develop and market Products for commercial sale and distribution in the Territory. Company shall be deemed to meet such "Commercially Reasonable Efforts" in the event it achieves all of the due diligence milestones set forth in this Article 6. Company shall achieve the following due diligence milestones ("**Milestones")** by the dates (**Achievement Dates"**) as set forth below

(i) **Due Diligence Milestones**

Milestone	Achievement Date
[***]	[***]
[***]	[***]

(ii) The applicable Achievement Date for each Milestone set forth above will be tolled in the event that, despite Company's commercially reasonable efforts to achieve such Milestone by the applicable Achievement Date, there is a regulatory, scientific or other technical delay in achieving such Milestone that is beyond the reasonable control of Company (a "**Tolling Event**"); provided that, Company will provide Columbia with notice of any such anticipated delay as soon as reasonably practicable after becoming aware that such a delay is likely and that Company uses its commercially reasonable efforts to overcome such delay during its pendency. Company will not be deemed to have failed to meet a required Achievement Date during the pendency of any delay contemplated by the prior sentence. Following resolution of any Tolling Event or in the event a Tolling Event does not occur, if Licensee believes that it will be unable to achieve a particular Milestone by the relevant Achievement Date, Licensee may extend such Achievement Date by a period of up to twelve (12) months upon the payment of a fee (the "**Extension Fee**") equal to $10,000, which extension Company must exercise no later than thirty (30) days before such Achievement Date. Licensee may extend each Milestone as set forth above only once. For clarity, in the event that the FDA requires Company to redo development work on the Product that was previously performed by a third party due to a change in formulation or for any other reason, such requirement will be deemed to be a Tolling Event and Company's obligation to meet the requirements of this Section 6 will be adjusted accordingly.

(iii) For purposes of this Agreement, "**Commercially Reasonable Efforts**" means, with respect to the efforts to be expended by Tonix with respect to any objective, the level of reasonable, diligent, good faith efforts that similarly situated Pharmaceutical Companies typically devote to products owned by them that are at a similar stage in their development or product life and are of similar market potential taking into account efficacy, safety, approved labeling, the competitiveness of alternative products in the marketplace, the patent and other proprietary position of the product, the likelihood of regulatory approval, the profitability of the product, and other relevant factors. As used in this definition, "**Pharmaceutical Companies**" means companies in the pharmaceutical industry of a size and stage of development similar to that of Tonix, including having human pharmaceutical product candidates or products in a similar stage of development to the Products and having access to similar funding.

Commercially Reasonable Efforts will be determined on a market-by-market and Product-by-Product basis, and it is anticipated that the level of effort will be different for different markets, and will change over time, reflecting changes in the status of the Product and the market(s) involved.

Notwithstanding any other provisions of this Agreement, if Company fails to use Commercially Reasonably Efforts as required by this Section 6, Columbia may terminate all of the licenses granted under Section 2 in accordance with Section 16 of this Agreement, or Columbia may convert any or all of such exclusive licenses to non-exclusive licenses with no further right to sublicense and no right to initiate legal proceedings under Section 11.

b. No less often than every twelve (12) months during the period beginning on the Effective Date of this Agreement and ending on the earlier of the date on which (i) the first Payment Report is provided to Columbia or (ii) this Agreement terminates or expires, Company shall report in writing to Columbia on progress made toward approval of a Product for sale in the United States, using Exhibit C to this Agreement or an equivalent to Exhibit C to make the report.

7. Confidentiality.

a. Except in accordance with Section 7c or 7d or to the extent reasonably necessary or beneficial to discover, develop, manufacture, use, sell, have sold, distribute, rent or lease Products in the Field, Company shall treat as confidential the Patents, Materials and Technical Information disclosed hereunder, and shall not disclose or distribute them to any third party without Columbia's written permission. Except in accordance with Section 7c and 7d, Columbia will keep confidential all information related to the development, manufacturing, commercialization or other exploitation of Products received from the Company or from anyone providing information on behalf of the Company, including, but not limited to, in accordance with the Company's reporting obligations and/or Columbia's audit rights under this Agreement.

b. The Parties shall keep confidential the business terms of this Agreement and any financial information disclosed by one Party to the other under this Agreement ("**Confidential Financial Information**").

c. Notwithstanding the above, the following are exceptions to keeping information confidential:

i) the Company may disclose confidential information (including, but not limited to this Agreement, or the terms of this Agreement) to actual or potential investors, partners, acquirers (of the Product or the Company), sublicensees, in connection with regulatory requirements of agencies like the FDA and SEC or the rules of any exchange on which Company's shares are traded, and to the extent reasonably necessary to meet its obligations under this Agreement, to its Affiliates, agents, representatives and employees;

ii) Columbia may disclose Confidential Financial Information to regulatory agencies such as the NIH and to U.S. or foreign courts or administrative tribunals, and to recipients that share in the license revenue generated under this Agreement, and, to the extent the following parties have an obligation to maintain the confidentiality of the subject information substantially in accordance with the terms hereof, to (A) Institutions, (B) third-party supporters of the research that led to the development of the intellectual property licensed hereunder to the Company, and (C) to potential investors in the equity or royalty stream due to Columbia under this Agreement, and

iii) Columbia may publicly disclose Confidential Financial Information on the condition that such disclosure is done in a manner so that a third party would not be able to attribute such Confidential Financial Information to the Company or this Agreement.

d. The obligations of confidentiality under this Section 7 do not apply to any Patents, Materials or Technical Information that Company can demonstrate to be the following:

(i) was known to Company before receipt thereof from Columbia;

(ii) was or becomes a matter of public information or publicly available through no act or failure to act on the part of the Company;

(iii) is acquired by Company from a third party entitled to disclose it to Company;

(iv) is required or requested by a court, agency or other governmental authority (but solely with respect to disclosure to such authority); or

(v) Company discovers, develops independently without reference to or use of such Patents, Materials or Technical Information, as evidenced by contemporaneous written records.

e. Defend Trade Secrets Act. Notwithstanding the foregoing, under 18 U.S.C. §1833(b), "An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal." Nothing in this Agreement or any Columbia policy is intended to conflict with this statutory protection, and no Columbia trustee, director, officer, or member of management has the authority to impose any practice to the contrary.

8. Disclaimer of Warranty; Limitations of Liability.

a. (1) To the actual knowledge of the officers of Columbia's office of Technology Ventures, as of the Effective Date, Columbia hereby represents and warrants to Company that: (i) all of the named inventors on the Patents filed with any patent office have assigned all of their right, title and interest in and to such inventions claimed in the Patents to Columbia; (ii) it has the power and authority to grant the licenses provided for herein to Company; (iii) Columbia is not in receipt of written notification of any claim, action, case, suit, litigation, arbitration, inquiry or proceeding pending or threatened by any Third Party, that seeks to challenge Columbia's ownership of Patents or the ability of Columbia to grant the licenses hereunder; (iv) it has not entered into any agreement, and will not knowingly enter into any agreement, that materially conflicts with the rights granted to Company herein; (v) each Prior License Agreement has been terminated and no Prior Licensee retains any interest in or to the Patents, the Materials, the Technical Information or any Product or any rights under a Prior License Agreement; and (vi) to Columbia's knowledge, no sublicenses have been granted to the Patents, the Materials, the Technical Information or any Product by a Prior Licensee.

(2) Columbia acknowledges that pursuant to the IIA, as of the Effective Date: (i) it has the exclusive right to negotiate and execute licenses to the Patents and Institutional Technical Information on behalf of Institutions; (ii) the IIA is in full force and effect and Columbia has neither received nor sent any written notice alleging breach of the IIA; and (iii) Columbia will not terminate or modify the IIA in a manner inconsistent with its obligations under this Agreement.

b. **Except as specifically set forth in this Agreement, Columbia, on behalf of itself and Institutions, makes no warranties either express or implied of any kind, and hereby expressly disclaims any warranties, representations or guarantees of any kind as to the Patents, Materials, Technical Information, Products and/or anything discovered, developed, manufactured, used, sold, offered for sale, imported, exported, distributed, rented, leased or otherwise disposed of under any license granted hereunder, including but not limited to the following: any warranties of merchantability or fitness, adequacy or suitability for a particular purpose, use or result;.**

c. In no event will Columbia, Institutions or their trustees, officers, faculty members, students, employees and agents, have any liability to Company, Sublicensees, Designees, or Affiliates of the foregoing, or any Third Party arising out of the use, operation or application of the Patents, Technical Information, Products, or anything discovered, developed, manufactured, used, sold, offered for sale, imported, exported, distributed, rented, leased or otherwise disposed of under any license granted hereunder by Company, Sublicensees, Designees or Affiliates of the foregoing, or any Third Party for any reason, including but not limited to, the unmerchantability, inadequacy or unsuitability of the Patents, Technical Information, Products and/or anything discovered, developed, manufactured, used, sold, offered for sale, imported, exported, distributed, rented, leased or otherwise disposed of under any license granted hereunder for any particular purpose or to produce any particular result, or for any latent defects therein.

d. Except in connection with Company's indemnification obligations under Section 12a, in no event will (i) Columbia, Institutions, or their trustees, officers, faculty members, students, employees and agents, be liable to the Company, Sublicensees, Designees or Affiliates of the foregoing, or any Third Party, or (ii) will Company, its Affiliates, Designees, Sublicensees, employees, agents or representatives be liable to Columbia or Institutions, or their trustees, officers, faculty members, students, employees and agents, for any consequential, incidental, special or indirect damages (including, but not limited to, from any destruction to property or from any loss of use, revenue, profit, time or goodwill) based on activity arising out of or related to this Agreement, whether in accordance with a claim for breach of contract or any other claim of any type.

d. In no event will Columbia's liability (or Institutions, if any) to Company exceed the payments made to Columbia by Company under this Agreement.

e. The parties hereto acknowledge that the limitations and exclusions of liability and disclaimers of warranty in this Agreement form an essential basis of the bargain between the parties.

9. Prohibition Against Use of Columbia's and Institutions' Names.

Company shall not use the name, insignia, or symbols of Columbia, Institution, their faculties or departments, or any variation or combination thereof, or the name of any trustee, faculty member, other employee, or student of Columbia or each of Institution for any purpose whatsoever without Columbia's or each of Institution's (as applicable) prior written consent; provided that, Company may disclose Columbia and/or Institution's names in a factual manner only, without implication of endorsement or affiliation, to identify Columbia and/or Institutions as the owner of the Patents and as licensors under this Agreement, in connection with any disclosure required by a regulatory agency, such as the FDA or the SEC or the rules of any exchange on which Company's shares are traded.

10. Compliance with Governmental Obligations.

a. Notwithstanding any provision in this Agreement, Columbia and Institutions disclaim any obligation or liability arising under the license provisions of this Agreement if Company or its Affiliates is charged in a governmental action for not complying with or fails to comply with governmental regulations in the course of taking steps to bring any Product to a point of practical application.

b. Company and its Affiliates shall comply upon reasonable notice from Columbia with all governmental requests directed to either Columbia, Institutions or Company or its Affiliates and provide all information and assistance necessary to comply with the governmental requests.

c. Company and its Affiliates shall ensure that research, development, manufacturing and marketing under this Agreement complies with all government regulations in effect including, but not limited to, Federal, state, and municipal legislation.

11. Patent Prosecution and Maintenance; Litigation.

a. Columbia, by counsel it selects and which Company has approved, in consultation with Company and any counsel appointed by the Company, shall prepare, file, prosecute and maintain all Patents in Columbia's or an Institution's name or a combination thereof and in countries designated by the Company, at its sole discretion. Columbia shall instruct its patent counsel (i) to copy Company on all correspondence related to Patents (including copies of each patent application, office action, response to office action, request for terminal disclaimer, and request for reissue or reexamination of any patent or patent application) and (ii) as requested by Company, to provide an update as to the current status of all Patents. The parties intend that consultation between the parties relating to the Patents under this Section 11 will be in accordance with a common interest in the validity, enforceability and scope of the Patents. Each party shall treat such consultation, along with any information disclosed by each party in connection therewith (including any information concerning patent expenses), on a confidential basis, and shall not disclose such consultation or information to any party without the other party's prior written consent. As part of Columbia and Company's mutual interest in consultation relating to the Patents, Columbia shall use reasonable efforts to provide Company with drafts of proposed responses no less than ten (10) business days before such response is due to the relevant patent office without penalty to allow the opportunity to review and provide comment regarding communications with any patent office. If Company seeks to challenge the validity, enforceability or scope of any Patent, Columbia's consultation obligation under this Section 11a terminates; any such termination will not affect Company's confidentiality and nondisclosure obligations with respect to consultation or disclosure of information before such termination, and will not affect any other provisions of this Agreement (including Company's reimbursement obligation under Section 11b).

b. Company shall reimburse Columbia for the actual fees, costs, and expenses Columbia has incurred before, on and after the Effective Date in preparing, filing, prosecuting and maintaining the Patents (and those patents and patent applications to which Patents claim priority), including without limitation, attorneys' fees, the costs of any interference proceedings, oppositions, re-examinations, or any other ex parte or inter partes administrative proceeding before patent offices, taxes, annuities, issue fees, working fees, maintenance fees and renewal charges, plus a five percent processing fee (collectively "**Patent Expenses**"). Columbia estimates that patent expenses incurred through December 31, 2018, under Section 11a in connection with the Patents in Exhibit A are $1,006.70 ("**Past Patent Expenses")**. Columbia will issue an invoice to Company for such amount and Company shall reimburse Columbia in full no later than thirty (30) days after receipt of the subject invoice. Company will reimburse Columbia for Patent Expenses incurred by Columbia after December 31, 2018 ("**Future Patent Expenses**") no later than thirty (30) days after receiving Columbia's invoice. However, at Columbia's election, Columbia may require advance payment of a reasonable estimate of Future Patent Expenses ("**Patent Expense Estimate")**, and Columbia may require the Company to make such payment up to three months before the date Columbia has chosen for the legal work to be completed. In any event, Columbia shall give at least 30 days' notice to the Company before the date the advance payment is due. Any unused balance, if any, will be credited towards future Patent Expenses, or upon Company's written request, returned to the Company. No later than thirty (30) days after receiving an invoice from Columbia for any Patent Expenses incurred in excess of the reasonable estimate, Company shall reimburse Columbia for such excess amount. Upon failure of Company to pay Patenting Expenses for any Patent(s) as required by this Section 11b, Columbia may in its discretion and upon providing notice to the Company take any of the following actions:

(i) abandon any or all Patent(s),

(ii) convert the license for any or all Patent(s) to non-exclusive, or

(iii) continue to prosecute any or all of the Patent(s) at its own expense, in which case the Company will have no further rights to such patent(s) under this agreement.

c. Subject to Sections 11d and 11f, Columbia may initiate, control, defend and/or settle any proceedings involving the validity, enforceability or infringement of any Patents when in its judgment such action may be necessary, proper, and justified. Columbia will use its reasonable efforts to coordinate such activities with Company and provide Company with updates as it reasonably requests.

d. Upon written notice to Columbia, Company may request that Columbia take steps to stop a third party who is selling a product that does or will compete with a Product sold or being developed by Company or any of its Affiliates (but not a Sublicensee, or Sublicensee Affiliate) ("**Third-Party Infringer**") from infringing an issued patent falling within the definition of Patents by providing Columbia with written evidence demonstrating prima facie infringement of specific claims of such Patent. Company may initiate legal proceedings against any such Third-Party Infringer in its own name and at Company's sole expense, unless Columbia, not later than ninety (90) days after receipt of such notice, either (i) causes such infringement to cease or (ii) initiates legal proceedings against the Third-Party Infringer. Company shall provide all assistance reasonably requested by Columbia and shall not make any admission or assert any position in any legal or administrative proceeding that is inconsistent with or adverse to any position asserted by Columbia in any proceedings against the Third-Party Infringer, without Columbia's prior written consent. Notwithstanding the foregoing, Columbia has no obligation to assert more than one Patent in one jurisdiction against the Third-Party Infringer. Any proposed disposition or settlement of a legal proceeding filed by Company to enforce any issued patent falling within the definition of Patents against any Third-Party Infringer is subject to Columbia's prior written approval, and Columbia shall not unreasonably withhold or delay its approval. Notwithstanding the foregoing, Company's rights under this Section 11d apply only to claims of Patents that are exclusively licensed to Company under this Agreement and only in the Field and Territory that are exclusively licensed to Company under this Agreement.

e. Under a legal proceeding initiated in accordance with Section 11d, the initiating party shall first use any recovery, whether by way of settlement or judgment, from a third party to reimburse itself for its actual fees, costs and expenses incurred in connection with such proceeding. The initiating party shall divide any remaining amounts from any such settlement or judgment as follows: (i) Columbia shall retain or receive, as applicable, the royalty that it would have received under Section 4b(ii) had such activities been performed by Company, and (ii) all other remaining amounts (including any punitive or exemplary damages) shall be divided 75% to the party who initiated or carried on the proceedings and 25% to the other party.

f. If a party initiates or defends a legal proceeding concerning any Patent under this Section 11, the other party shall cooperate fully with and supply all assistance reasonably requested by the party initiating such proceeding, including without limitation, joining the proceeding as a party if requested. The party that institutes any legal proceeding concerning any Patent under this Section 11 shall have sole control of that proceeding.

12. Indemnity and Insurance.

a. Company shall indemnify, defend, and hold harmless Columbia, Institutions, and their trustees, officers, faculty, employees, students and agents, from and against any and all actions, suits, claims, demands, prosecutions, liabilities, costs, expenses, damages, deficiencies, losses or obligations (including attorneys' fees) based on, arising out of, or relating to third party claims arising in connection with this Agreement to the extent arising out of (i) Company's discovery, development, manufacture, packaging, use, sale, offering for sale, importation, exportation, distribution, rental or lease of Products, even if altered for use for a purpose not intended, (ii) the use of Patents, Materials or Technical Information by Company, Sublicensees, Designees, or their Affiliates or customers, (iii) any representation made or warranty given by Company, Sublicensees, Designees, or their Affiliates with respect to Products, Patents, Materials or Technical Information, (iv) any infringement claims relating to Products, Patents, Materials or Technical Information, and (v) any asserted violation of the Export Laws (as defined in Section 14) by Company, Sublicensees, Designees, or their Affiliates. Company shall reimburse Columbia and Institutions for the actual reasonable and documented fees, costs, and expenses (including reasonable and documented attorneys' fees) that it may incur in enforcing this provision. Notwithstanding the foregoing, Company shall have no obligation to indemnify, defend or hold harmless any person or entity, to the extent a subject claim or loss arises in connection with the negligence, fraud, or willful misconduct by Columbia or any person or entity acting (or failing to act) on its behalf, as determined by a court of competent jurisdiction.

b. Company shall maintain commercial general liability insurance (including product liability and contractual liability insurance applicable to Company's indemnity obligations under Section 12a) with reputable and financially secure insurance carriers reasonably acceptable to Columbia to cover the activities of Company, Sublicensees, Designees, and their Affiliates, for minimum limits of $5,000,000 combined single limit for bodily injury and property damage per occurrence and in the aggregate. Company shall contract for such insurance to include Columbia, Institutions, their trustees, faculty, officers, employees and agents as additional insureds. Company shall furnish a certificate of insurance evidencing such coverage, with thirty days' written notice to Columbia of cancellation or material change in coverage. The minimum amounts of insurance coverage required herein are deemed not to be construed as creating any limitation on the Company's indemnity obligation under Section 12a of this Agreement.

c. Company's insurance is primary coverage; any insurance Columbia may purchase is excess and noncontributory. The Company shall contract for its insurance to be written to cover claims incurred, discovered, manifested, or made during or after the expiration of this Agreement.

d. Company shall comply with all statutory workers' compensation and employers' liability requirements covering its employees with respect to activities performed under this Agreement.

13. Marking.

Before the issuance of patents falling within the definition of Patents, Company shall mark all Patent Products made, sold, offered for sale, imported, or otherwise disposed of by Company under the license granted in this Agreement with the words "Patent Pending," and following the issuance of one or more patents, with the numbers of such patents. The Company shall cause its Affiliates, and its Sublicensees and Designees and their Affiliates, to comply with the marking requirements of this Section 13.

14. Export Control Laws.

a. Company agrees to comply with U.S. export laws and regulations pertaining to the export of technical data, services and commodities, including the International Traffic in Arms Regulations (22 C.F.R. § 120 et seq.), the Export Administration Regulations (15 C.F.R. § 730 et seq.), the regulations administered by the Treasury Department's Office of Foreign Assets Control (31 C.F.R. § 500, et seq.), and the Anti-Boycott Regulations (15 C.F.R. § 760) (individually and collectively, "**Export Laws**"). The parties shall cooperate with each other to facilitate compliance with these laws and regulations.

b. Company understands that sharing controlled technical data with non-U.S. persons is an export to that person's country of citizenship that is subject to U.S. export laws and regulations, even if the transfer occurs in the United States. Company shall obtain any necessary U.S. government license or other authorization required under the U.S. export control laws and regulations for the export or re-export of any commodity, service or technical data covered by this Agreement, including technical data acquired from Columbia under this Agreement and products created as a result of that data.

15. Breach and Cure.

a. Either party may terminate this Agreement upon written notice of a material breach that is not cured as contemplated by subsection (b) below. Company is deemed to be in material breach of this Agreement if it should commit any of the following: (i) failure to pay fully and promptly amounts due under Section 4 (including without limitation, any payments required under subsection h thereof) and payable under Section 5; (ii) failure of Company to meet any of its obligations under Section 6 of this Agreement; (iii) failure to comply with governmental requests directed to Columbia or Company under Section 10b; (iv) failure to reimburse Columbia for or pay fully and promptly the costs of prosecuting and maintaining Patents under Section 11; (v) failure to obtain and maintain insurance in the amount and of the type provided for in Section 12; and (vi) failure to comply with the Export Laws under Section 14.

b. Either party may cure its material breach. The cure to cure shall expire if not effected within a reasonable period of time but in no event later than sixty (60) days after notice of any breach given by the non-breaching party.

c. In the event an allegedly breaching party, in good faith, disputes a breach, the dispute shall be discussed by the parties in good faith for a period of no less than thirty (30) days from the date of notification of breach. In the event such a dispute between the parties is not settled within thirty (30) days, the issue shall be escalated to the Executive Director of Columbia Technology Ventures, or his/her designee at Columbia and the Chief Executive Officer of Company, or his/her designee, to try to resolve such dispute in good faith. If the parties are unable to resolve the dispute within ninety (90) days of such escalation, then either party may initiate dispute resolution procedures pursuant to Section 25.

16. Term of Agreement.

a. This Agreement is effective as of the Effective Date and continues in full effect until its expiration or termination in accordance with this Section 16. In addition, upon any termination of this Agreement under Section 16c or 16(d)(ii), (i) Columbia will have the option, exercisable by written notice to Company within sixty (60) days of such termination, to enter into good faith negotiations for a worldwide, royalty bearing license on commercially reasonable terms with respect to (i) all know-how, technical information and data developed by Company ("**Company Technical Information**") during the term of this Agreement, and before its termination, to the extent such Company Technical Information is related to the Company's efforts to develop Products; (ii) all Company filed patent applications or Company obtained patents, solely and exclusively related to any addition, development, modification and/or improvement of Products ("**Company Patents**"); and (ii) Company will transfer to Columbia any regulatory filings or other regulatory materials made by Company (including, for clarity, any NDA) with respect to Products during the term of this Agreement.

b. Unless terminated earlier under any provision of this Agreement, the term of the licenses granted hereunder and the obligation to make royalty payments on Products extend, on a country-by-country and Product-by-Product basis, until the latest of (i) the date of expiration of the last valid claim in the last to expire of the issued patents falling within the definition of Patents, (ii) fifteen (15) years after the first bona fide commercial sale of a Product in the country in question, or (iii) expiration of any market exclusivity period granted by a regulatory agency.

c. The licenses granted under this Agreement may be terminated by Columbia or, at Columbia's option, Columbia has the right to convert any or all of such exclusive licenses granted under this Agreement to non-exclusive licenses, with no right to further sublicense and no right to initiate legal proceedings under Section 14, as follows: (i) thirty (30) days after Company's receipt of written notice of Company's breach if Columbia elects to terminate in accordance with Section 6a; (ii) upon written notice to Company for Company's material breach of the Agreement and Company's failure to cure such material breach in accordance with Section 15b; (iii) if Company files for bankruptcy protection; (iv) if Company ceases to conduct business as a going concern; and (v) if Company (or any entity or person acting on its behalf) initiates any proceeding or otherwise asserts any claim challenging the validity or enforceability of any Patent in any court, administrative agency or other forum. Termination under (ii) – (v) is effective upon the date the notice is sent under Section 17.

d. Company has the right to terminate this Agreement on a country-by-country and a Product-by-Product basis as follows: (i) upon written notice to Columbia for Columbia's material breach of the Agreement and Columbia's failure to cure such material breach in accordance with Section 15b or (ii) at its discretion, upon six (6) months' written notice to Columbia.

e. Upon any termination of this Agreement under Section 16c, all sublicenses granted by the Company under it shall survive provided that such Sublicensee is not in breach of the sublicense, and Columbia may, in its sole discretion enter into a direct license with such Sublicensee, provided that Columbia's obligations under such sublicense are consistent with and not exceed Columbia's obligations to Company under this Agreement and on the condition that such sublicense agrees in a writing sent to Columbia to assume all obligations of this Agreement for the benefit of Columbia, including the obligations to make all payments due under this Agreement, including but not limited to those specified in Section 4b, 4c, 4d, 4h and 11b.

f. Sections 4h, 5c, 5f, 5g, 7, 8, 9, 10, 12, 14, 16e, 16f, 16g, 16h, 17, 19, 22, 23, 24, and 25 will survive any termination or expiration of this Agreement for the period stated in the applicable section, and if no period is stated, such provision shall survive indefinitely.

g. Any termination of this Agreement does not adversely affect any rights or obligations that may have accrued to either party before the date of termination, including without limitation, Company's obligation to pay all amounts due and payable under Sections 4 (including any payments required under subsection h thereof), 5 and 11.

h. Upon any termination of this Agreement for any reason other than the expiration of this Agreement under Section 16b or Company's failure to cure a material breach of this Agreement under Section 16c(ii), Company, Sublicensees, Designees, and their Affiliates have the right, for one year or such longer period as the parties may reasonably agree, to dispose of Products or substantially completed Products then on hand, and to complete orders for Products then on hand (the "**Inventory")**, and shall pay royalties to Columbia with respect to such Inventory as though this Agreement had not terminated. Within 30 days after termination, the Company shall provide Columbia with an Inventory report. If this Agreement expires under Section 16b, then the Company is thereafter free to use the Technical Information and Materials without any further obligation to Columbia. For clarity, in the event of an expiration of this Agreement under Section 16(b) and after application of Section 16(i), all licenses granted under this Agreement will be deemed fully paid-up and Company, Sublicensees, Designees, and their Affiliates may continue to sell Inventory without any obligation to pay royalties to Columbia, Institutions or any Third Party.

i. Notwithstanding anything to the contrary in the Agreement, to the extent the manufacture of a Product is Covered By an issued patent within the definition of Patents and occurs before the expiration of such issued patent, the sale of that Product after the expiration date of the issued patent still constitutes a royalty-bearing sale under Section 4.

17. Notices. Any notice required or permitted to be given under this Agreement is sufficient if in writing and is considered given (i) when mailed by certified mail (return receipt requested), postage prepaid, or (ii) on the date of actual delivery by hand or overnight delivery, with receipt acknowledged, as follows:

if to Columbia, to:	Executive Director Columbia Technology Ventures Columbia University 80 Claremont Avenue, #4F, Mail Code 9606 New York, NY 10027-5712
copy to:	General Counsel Columbia University 412 Low Memorial Library 535 West 116th Street, Mail Code 4308 New York, New York 10027
if to the Company, to:	Tonix Pharmaceuticals Holding Corp. 509 Madison Avenue Suite 306 New York, NY 10022 Attn: Seth Lederman

copy to (which shall not constitute notice): Lowenstein Sandler LLP
One Lowenstein Drive
Roseland, New Jersey 07068
Attn: Michael J. Lerner, Esq.

or to such other address as a party may specify by notice hereunder.

18. Assignment. This Agreement and all rights and obligations hereunder may not be assigned by either party without the written consent of the other party; provided that, Tonix may assign this Agreement to an Affiliate or in connection with a merger, consolidation, sale, or transfer of all or substantially all its assets or all or substantially all of its assets associated with its business related to the Product. Any permitted assignee will be required to assume all obligations under this Agreement in writing in connection with the permitted assignment. Company shall provide Columbia with written notice of any such assignment. Any attempt to assign without compliance with this provision will be void.

19. Waiver and Election of Remedies. The failure of any party to insist upon strict adherence to any term of this Agreement on any occasion will not be considered a waiver or deprive that party thereafter of the right to insist upon strict adherence to that term or any other term of this Agreement. All waivers must be in writing and signed by an authorized representative of the party against which such waiver is being sought. The pursuit by either party of any remedy to which it is entitled at any time or continuation of the Agreement despite a breach by the other will not be deemed an election of remedies or waiver of the right to pursue any other remedies to which it may be entitled.

20. Binding on Successors. This Agreement is binding upon and inures to the benefit of the parties and their respective successors and assigns to the extent assignment is permitted under this Agreement.

21. Independent Contractors. It is the express intention of the parties that the relationship between Columbia and the Company is that of independent contractors and is not that of agents, partners or joint venturers. Nothing in this Agreement is intended or will be construed to permit or authorize either party to incur or represent that it has the power to incur any obligation or liability on behalf of the other party.

22. Entire Agreement; Amendment. This Agreement, together with the Exhibits, sets forth the entire agreement between the parties concerning the subject matter hereof and supersedes all previous agreements, written or oral, concerning such subject matter. This Agreement may be amended only by a written agreement duly executed by the parties.

23. Severability. If any provision of this Agreement is held by a court of competent jurisdiction to be unenforceable because it is invalid, illegal or unenforceable, the validity of the remaining provisions will not be affected, and the rights and obligations of the parties will be construed and enforced as if the Agreement did not contain the particular provisions held to be unenforceable, unless such construction would materially alter the meaning of this Agreement. By way of example, but not by way of limitation, Sections 4h(i), 4h(ii) and 4h(iii) are intended by Company and Columbia to be severable from each other, such that if one clause is found to be unenforceable, the other clauses remain operative and in effect.

24. Third-Party Beneficiaries. Institutions are not parties to this Agreement, but Institutions are intended third-party beneficiaries of the provisions of Sections 2d, 3, 8, 9, 10a, 10b, 12a and 12b, which are for the benefit of Institutions and are enforceable by Institutions in their own names. Except as expressly set forth herein, the parties hereto agree that there are no third-party beneficiaries of any kind to this Agreement.

25. Governing Law. This Agreement is be governed and construed in accordance with the internal substantive laws of the State of New York as applicable to agreements made and wholly performed within the State of New York, and without reference to the conflict or choice of laws principles of any jurisdiction. Unless otherwise separately agreed in writing, the parties agree that any and all claims arising under or related to this Agreement will be heard and determined only in either the United States District Court for the Southern District of New York or in the courts of the State of New York located in the City and County of New York, and the parties irrevocably agree to submit themselves to the exclusive and personal jurisdiction of those courts and irrevocably waive any and all rights that any such party may now or hereafter have to object to such jurisdiction or the convenience of the forum.

26. Execution in Counterparts; Facsimile or Electronic Transmission. This Agreement may be executed in counterparts, and by facsimile or electronic transmission. This Agreement is not binding on the parties until it has been signed below on behalf of each party.

IN WITNESS WHEREOF, Columbia and the Company have caused this Agreement to be executed by their duly authorized representatives as of the day and year first written above.

THE TRUSTEES OF COLUMBIA
UNIVERSITY IN THE CITY OF NEW YORK

By _____

Executive Director,
Columbia Technology Ventures

TTS # 53663

Tonix Pharmaceuticals Holding Corp.

By _____

Title _____

Exhibit A

Patents and applications

[***]

Exhibit B

Technical Information:

Know-How and Materials included those developed by Columbia and/or institutions related to the Product, those provide to the Company by Columbia and those stored at CROs, including the following:

[***]

Regulatory Documentation:

Existing IND and pre-clinical and clinical documents that Columbia developed and/or received from Columbia's previous licensee, all correspondence with the FDA, all data underlying Regulatory Documentation, all of the regulatory documentation that has been uploaded to the data room shared with Company.

EXHIBIT C

Annual Commercialization Report

As per the terms of the License Agreement between Columbia University and [name of company], Licensee is required to deliver an annual commercialization report. This report should be true and accurate, certified by an officer of the Licensee, and should describe Licensee's, Affiliates', and Sublicensees' efforts to diligently commercialize Products and Services during the past contract year and for the next contract year. For convenience, Columbia Technology Ventures (CTV) is providing the following outline to enable Licensee to report the required information.

Instructions:

- *For Yes/No questions, please place an "X" between the appropriate brackets.*

Licensee Name and Current Address:	
Name of Primary Contact:	
CTV Agreement Number:	
Effective Date of Original Agreement:	
Dates of any License Amendments:	
Report Period Beginning:	
Report Period Ending:	

1. **Sales:**

Is the Licensee currently marketing or selling one or more products which incorporated the licensed technology?

[_] NO – Please provide a progress report on commercialization efforts *(skip to Q:3)*.
[_] YES – Please provide the company's most recent sales forecasts and/or commercialization plan for each product.

2. **Accounting Methodologies:**

Have you changed the accounting methodologies used in the sales reports you currently provide to Columbia in the last year?

[_] NO – Accounting methodologies have not changed.
[_] YES – Please explain:

3. **Affiliates and Sublicensees:**

Have there been any new Affiliates or Sublicensees not previously reported?

[_] NO – No new Affiliates or Sublicensees.

[_] YES – Please list names of all Affiliates/Sublicensees:

(Attach copies of Affiliate/Sublicensee agreements)

4. Contractual Diligence or Sales Milestones:

Please complete the table below (if not applicable leave blank):

Milestone per agreement terms	**Contractual Deadline**	**Met? (Y/N)**	**Achievement Date**

Comments or notes relating to these milestones: _____

I certify that the information above is true and correct to the best of my knowledge.

By _____ Date_____
Signature of authorized representative

Printed Name:

Title:

CTV Contact Information:

Reporting:
(Electronic delivery is preferred) Stephen Lewis Business Manager, Accounts Receivable Columbia Technology Ventures 51 Audubon Avenue, 2nd Floor New York, NY 10035 Phone: 212-342-1176 E-mail: ctvfinance@columbia.edu

EXHIBIT 31.01

CERTIFICATION

I, Seth Lederman, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Tonix Pharmaceuticals Holding Corp.;

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 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 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 reasonable 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 controls over financial reporting.

Date: August 12, 2019

/s/ Seth Lederman
Seth Lederman
Chief Executive Officer

EXHIBIT 31.02

CERTIFICATION

I, Bradley Saenger, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Tonix Pharmaceuticals Holding Corp.;

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 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 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 reasonable 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 controls over financial reporting.

Date: August 12, 2019

/s/ Bradley Saenger
Bradley Saenger
Chief Financial Officer

EXHIBIT 32.01

CERTIFICATIONS OF CHIEF EXECUTIVE OFFICER AND CHIEF FINANCIAL OFFICER
PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

I, Seth Lederman, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Tonix Pharmaceuticals Holding Corp. on Form 10-Q for the fiscal quarter ended June 30, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in this Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of Tonix Pharmaceuticals Holding Corp.

By: /s/ Seth Lederman

Date: August 12, 2019

Name: Seth Lederman
Title: *Chief Executive Officer*

I, Bradley Saenger, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that the Quarterly Report of Tonix Pharmaceuticals Holding Corp. on Form 10-Q for the fiscal quarter ended June 30, 2019 fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934 and that information contained in this Quarterly Report on Form 10-Q fairly presents in all material respects the financial condition and results of operations of Tonix Pharmaceuticals Holding Corp.

By: /s/ Bradley Saenger

Date: August 12, 2019

Name: Bradley Saenger
Title: *Chief Financial Officer*