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 March 31, 2021

or

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

For the Transition Period from _____ to _____

Commission file number: 001-36019

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.)
26 Main Street, Suite 101 Chatham, New Jersey	**07928**
(Address of principal executive offices)	(zip code)

(862) 904-8182
(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 every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer," and "smaller reporting 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 May 7, 2021, there were 326,509,139 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)

	March 31, 2021 (unaudited)	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 164,214	$ 77,068
Prepaid expenses and other	8,951	10,921
Total current assets	173,165	87,989
Property and equipment, net	9,070	8,571
Right of use assets, net	921	1,258
Security deposit	5	5
Restricted cash	240	240
Intangible asset	120	120
Total assets	$ 183,521	$ 98,183
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 2,859	$ 4,598
Accrued expenses and other current liabilities	2,783	4,626
Lease liability, current	386	595
Total current liabilities	6,028	9,819
Lease liability, net of current	577	716
Total liabilities	6,605	10,535
Commitments (See Note 15)		
Stockholders' equity:		
Preferred stock, $0.001 par value; 5,000,000 shares authorized		
Series B Convertible Preferred stock, $0.001 par value; 5,313 shares designated as of March 31, 2021 and December 31, 2020 issued and outstanding - None		
Series A Convertible Preferred stock, $0.001 par value; 7,938 shares designated as of March 31, 2021 and December 31, 2020 issued and outstanding - None	—	—
Common stock, $0.001 par value; 800,000,000 and 400,000,000 shares authorized as of March 31, 2021 and December 31, 2020, respectively; 323,917,731 and 206,008,683 shares issued and outstanding as of March 31, 2021 and December 31, 2020, respectively, and 54,447 shares to be issued as of December 31, 2020	324	206
Additional paid in capital	464,841	355,037
Accumulated deficit	(288,186)	(267,533)
Accumulated other comprehensive loss	(63)	(62)
Total stockholders' equity	176,916	87,648
Total liabilities and stockholders' equity	$ 183,521	$ 98,183

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 March 31,	
	2021	**2020**
COSTS AND EXPENSES:		
Research and development	$ 15,327	$ 4,676
General and administrative	5,409	2,621
	20,736	7,297
Operating loss	(20,736)	(7,297)
Interest and other income, net	83	24
Net loss	(20,653)	(7,273)
Warrant deemed dividend	—	451
Preferred stock deemed dividend	—	1,260
Net loss available to common stockholders	$ (20,653)	$ (8,984)
Net loss per common share, basic and diluted	$ (0.07)	$ (0.37)
Weighted average common shares outstanding, basic and diluted	290,106,510	24,028,970

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 March 31,	
	2021	**2020**
Net loss	$ (20,653)	$ (7,273)
Other comprehensive loss:		
Foreign currency translation loss	(1)	(14)
Total other comprehensive loss	(1)	(14)
Comprehensive loss	$ (20,654)	$ (7,287)

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
THREE MONTHS ENDED MARCH 31, 2021 AND 2020
(In Thousands, Except Share and Per Share Amounts)
(unaudited)

	Series B Convertible Preferred stock		Common stock		Additional Paid in	Accumulated Other Comprehensive	Accumulated	
	Shares	Amount	Shares	Amount	Capital	Gain (loss)	Deficit	Total
Balance, December 31, 2020	—	$ —	206,008,683	$ 206	$ 355,037	$ (62)	$ (267,533)	$ 87,648
Issuance of common stock upon exercise of warrants in March 2021 ($0.57 per share)	—	—	3,400	—	2	—	—	2
Issuance of common stock in January 2021 ($0.80 per share), net of transactional expenses of $3,096	—	—	50,000,000	50	36,854	—	—	36,904
Issuance of common stock in February 2021 ($1.20 per share), net of transactional expenses of $5,002	—	—	58,333,334	58	64,939	—	—	64,997
Issuance of common stock under at-the-market offering, net of transactional expenses of $230	—	—	9,517,867	10	6,769	—	—	6,779
Employee stock purchase plan	—	—	54,447	—	28	—	—	28
Stock-based compensation	—	—	—	—	1,212	—	—	1,212
Foreign currency transaction gain	—	—	—	—	—	(1)	—	(1)
Net loss	—	—	—	—	—	—	(20,653)	(20,653)
Balance, March 31, 2021	—	$ —	323,917,731	$ 324	$ 464,841	$ (63)	$ (288,186)	$ 176,916

See the accompanying notes to the condensed consolidated financial statements

TONIX PHARMACEUTICALS HOLDING CORP.
CONDENSED CONSOLIDATED STATEMENT OF STOCKHOLDERS' EQUITY
THREE MONTHS ENDED MARCH 31, 2021 AND 2020
(In Thousands, Except Share and Per Share Amounts)
(unaudited)

	Series B Convertible Preferred stock		Common stock		Additional Paid in	Accumulated Other Comprehensive	Accumulated	
	Shares	Amount	Shares	Amount	Capital	Gain (loss)	Deficit	Total
Balance, December 31, 2019	—	$ —	8,531,504	$ 9	$ 226,524	$ (46)	$ (217,070)	$ 9,417
Issuance of common stock in exchange for exercise of warrants in February and March 2020 ($0.57 per share)	—	—	13,111,999	13	7,461	—	—	7,474
Deemed dividend in connection with repricing of November 2019 warrants	—	—	—	—	451	—	—	451
Warrant deemed dividend	—	—	—	—	(451)	—	—	(451)
Issuance of Series B Convertible preferred stock and common stock warrants in February 2020 ($1,000.00 per share, net of transactional expenses of $711)	5,313	—	—	—	4,602	—	—	4,602
Beneficial conversion feature in connection with issuance of Series B Convertible preferred stock	—	—	—	—	1,260	—	—	1,260
Preferred stock deemed dividend	—	—	—	—	(1,260)	—	—	(1,260)
Issuance of common stock and common stock warrants in February 2020 ($0.57 per share, net of transactional expenses of $292)	—	—	3,837,000	4	1,891	—	—	1,895
Issuance of common stock upon conversion of Series B Convertible preferred stock	(5,313)	—	9,321,053	9	(9)	—	—	—
Issuance of common stock in March 2020 ($1.10 per share, net of transactional expenses of $1,221)	—	—	14,550,000	14	14,770	—	—	14,784
Employee stock purchase plan	—	—	1,578	—	2	—	—	2
Stock-based compensation	—	—	—	—	360	—	—	360
Foreign currency transaction gain	—	—	—	—	—	(14)	—	(14)
Net loss	—	—	—	—	—	—	(7,273)	(7,273)
Balance, March 31, 2020	—	$ —	49,353,134	$ 49	$ 255,601	$ (60)	$ (224,343)	$ 31,247

See the accompanying notes to the condensed consolidated financial statements

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

	Three Months Ended March 31,	
	2021	**2020**
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (20,653)	$ (7,273)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	6	6
Stock-based compensation	1,212	360
Changes in operating assets and liabilities:		
Prepaid expenses and other	1,971	(39)
Accounts payable	(1,739)	(1,662)
Lease liabilities and ROU asset, net	(12)	(2)
Accrued expenses and other current liabilities	(1,843)	(716)
Net cash used in operating activities	(21,058)	(9,326)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchase of property and equipment	(505)	—
Net cash used in investing activities	(505)	—
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from the exercise of warrants	2	7,474
Proceeds from ESPP	28	2
Proceeds, net of expenses of $0 and $711, from the sale of preferred stock	—	4,602
Proceeds, net of expenses of $8,328 and $1,513, from sale of common stock and warrants	108,680	16,679
Net cash provided by financing activities	108,710	28,757
Effect of currency rate change on cash	(1)	(15)
Net increase in cash, cash equivalents and restricted cash	87,146	19,416
Cash, cash equivalents and restricted cash beginning of the period	77,308	11,349
Cash, cash equivalents and restricted cash end of period	$ 164,454	$ 30,765
Supplemental disclosures of cash flow information:		
Non-cash financing activities:		
Series B Convertible preferred stock deemed dividend	$ —	$ 1,260
Warrants deemed dividend	$ —	$ 451

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, licensing, acquiring and developing small molecules and biologics to treat and prevent human disease and alleviate suffering. 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., Jenner LLC, Tonix Pharma Holdings Limited and Tonix Pharma Limited (collectively hereafter referred to as the "Company" or "Tonix"). All intercompany balances and transactions have been eliminated in consolidation.

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 March 31, 2021, the Company had working capital of approximately $167.1 million. At March 31, 2021, the Company had an accumulated deficit of approximately $288.2 million. The Company held unrestricted cash and cash equivalents of approximately $164.2 million as of March 31, 2021.

The Company believes that its cash resources at March 31, 2021, and the proceeds that it raised from equity offerings subsequent to the end of the first quarter of 2021 (See Note 11), will meet its operating and capital expenditure requirements through March 31, 2022, but not beyond.

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, its available capital resources may be consumed more rapidly than currently expected due to changes it may make in its research and development spending plans. The Company has the ability to obtain additional funding through public and private financing and 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, it 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 operations. If any of these events occurs, our ability to achieve our 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, 2020 contained herein has been derived from audited financial statements.

Operating results for the three months ended March 31, 2021 are not necessarily indicative of results that may be expected for the year ending December 31, 2021. 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, 2020 included in the Company's Annual Report on Form 10-K, filed with the Securities and Exchange Commission ("SEC") on March 15, 2021.

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 any of its product candidates 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 candidate will be approved or commercially viable. Moreover, the extent to which COVID-19 impacts the Company's operations will depend on future developments, which are highly uncertain and cannot be predicted with confidence at this time.

In December 2019, a novel strain of Coronavirus ("COVID-19") emerged that has caused significant disruptions to the U.S. and global economy. The spread of COVID-19 has led to regional quarantines, business shutdowns, labor shortages, disruptions to supply chains, and overall economic instability. Any of these events may in the future have a material adverse effect on our business, operations and financial condition. The extent to which COVID-19 impacts our operations will depend on future developments, which are highly uncertain and cannot be predicted with confidence, including the duration of the outbreak, new information that may emerge concerning the severity of COVID-19 and the actions taken to contain COVID-19 or treat its impact, among other things.

Use of estimates

The preparation of financial statements in accordance with Generally Accepted Accounting Principles ("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 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 March 31, 2021 and December 31, 2020, cash equivalents, which consisted of money market funds, amounted to $100.4 million and $40.4 million, respectively. Restricted cash at both March 31, 2021 and December 31, 2020 of approximately $240,000 collateralizes a letter of credit issued in connection with the lease of office space in Chatham, New Jersey and New York, New York (see Note 14).

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 flows:

	March 31, 2021	December 31, 2020
	(in thousands)	
Cash and cash equivalents	$ 164,214	$ 77,068
Restricted cash	240	240
Total	$ 164,454	$ 77,308

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 20 years for buildings, three years for computer assets, five years for furniture and all other equipment and term of lease for leasehold improvements. Depreciation and amortization expense for both quarters ended March 31, 2021 and 2020 was $6,000. All property and equipment is located in the United States and Ireland.

Intangible assets with indefinite lives

During the year ended December 31, 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 their carrying amount may be less than fair value. As of March 31, 2021, the Company believed that no impairment existed.

Leases

The Company determines if an arrangement is, or contains, 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 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 subsequent lease commencement dates 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 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 made under operating leases is recognized on a straight-line basis over the lease term.

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 nonemployees for their services, including grants of restricted stock units ("RSUs"), and stock options, are measured at fair value on the grant date and recognized in the consolidated statements of operations as compensation or other expense over the requisite service period. The Company accounts for share-based awards in accordance with the provisions of the Accounting Standards Codification ("ASC") 718, Compensation – Stock Compensation.

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 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-owners 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 condensed 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 March 31, 2021, the Company has not recorded any unrecognized tax benefits. The Company's policy is to recognize interest and penalties accrued on any unrecognized tax benefits as a component of income tax expense.

Per Share Data

The computation of basic and diluted loss per share for the quarters ended March 31, 2021 and 2020 excludes potentially dilutive securities when their inclusion would be anti-dilutive, or if their exercise prices were greater than the average market price of the common stock during the period.

All warrants issued participate on a one-for-one basis with common stock in the distribution of dividends, if and when declared by the Board of Directors, on the Company's common stock. For purposes of computing EPS, these warrants are considered to participate with common stock in earnings of the Company. Therefore, the Company calculates basic and diluted EPS using the two-class method. Under the two-class method, net income for the period is allocated between common stockholders and participating securities according to dividends declared and participation rights in undistributed earnings. No income was allocated to the warrants for the three months ended March 31, 2021 and March 31, 2020, as results of operations were a loss for the period.

Potentially dilutive securities (See Note 12 and Note 13) excluded from the computation of basic and diluted net loss per share, as of March 31, 2021 and 2020, are as follows:

	2021	2020
Warrants to purchase common stock	644,906	5,184,210
Options to purchase common stock	22,983,353	665,536
Totals	23,628,259	5,849,746

NOTE 3 – PROPERTY AND EQUIPMENT, NET

Property and equipment, net consisted of the following (in thousands):

	March 31 2021	December 31 2020
	(in thousands)	
Land	$ 5,713	$ 5,713
Construction in progress	3,290	2,800
Office furniture and equipment	400	385
Leasehold improvements	23	23
	9,426	8,921
Less: Accumulated depreciation and amortization	(356)	(350)
	$ 9,070	$ 8,571

On September 28, 2020, the Company completed the purchase of its 40,000 square foot facility in Massachusetts for $4,000,000, to house its new Advanced Development Center for accelerated development and manufacturing of vaccines. Of the total purchase price, $1.2 million was allocated to the value of land acquired, and $2.8 million was allocated to construction in progress, as the building was not ready for its intended use. As of March 31, 2021, the asset has not been placed in service.

On December 23, 2020, the Company completed the purchase of its approximately 44-acre site in Hamilton, Montana for $4.4 million, for the construction of a vaccine development and commercial scale manufacturing facility. As of March 31, 2021, the asset has not been placed in service.

NOTE 4 – 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 March 31, 2021, and December 31, 2020, the Company used Level 1 quoted prices in active markets to value cash equivalents of $100.4 million and $40.4 million, respectively. The Company did not have any Level 2 or Level 3 assets or liabilities as of both March 31, 2021 and December 31, 2020.

NOTE 5 – STOCKHOLDERS' EQUITY

On March 26, 2021, the Company filed an amendment to its articles of incorporation, as amended, to increase the number of shares of common stock authorized from 400,000,000 to 800,000,000.

On October 1, 2020, the Company received a letter from the Listing Qualifications staff of The Nasdaq Stock Market LLC ("Nasdaq") indicating that, based upon the closing bid price of the Company's common stock for the last 30 consecutive business days, the Company no longer meets the requirement to maintain a minimum bid price of $1.00 per share, as set forth in Nasdaq Listing Rule 5450(a)(1) (the "Minimum Bid Price Requirement"). On March 3, 2021, the Company received a letter from Nasdaq stating that Company had regained compliance with the Minimum Bid Price Requirement because the Company's shares had a closing bid price at or above $1.00 per share for a minimum of 20 consecutive business days.

NOTE 6 – ASSET PURCHASE AGREEMENT WITH KATANA

On December 22, 2020, the Company entered into an asset purchase agreement (the "Katana Asset Purchase Agreement") with Katana Pharmaceuticals, Inc. ("Katana") pursuant to which Tonix acquired Katana assets related to insulin resistance and related syndromes, including obesity (the "Katana Assets"). In connection with the acquisition of the Katana Assets, Tonix assumed Katana's rights and obligations under that certain Exclusive License Agreement by and between Katana and The University of Geneva ("Geneva") (the "Geneva License "Agreement") pursuant to an Assignment and Assumption Agreement with Geneva ("Geneva Assignment and Assumption Agreement"), dated December 22, 2020. As consideration for entering into the Katana Asset Purchase Agreement, Tonix paid $0.7 million to Katana. The costs associated with the cash payments were recorded to research and development expenses in the statement of operations for the year ended December 31, 2020. Because the Katana intellectual property was acquired prior to FDA approval, the cash consideration totaling $0.7 million, was expensed as research and development costs since there is no alternative future use and the acquired intellectual property does not constitute a business.

Pursuant to the terms of the Geneva Assignment and Assumption Agreement, Geneva has granted to Tonix an exclusive license, with the right to sublicense, certain patents related to the Katana Assets. Tonix is obligated to use commercially reasonable efforts to diligently develop, manufacture, and sell products claimed or covered by the patent and will use commercially reasonable efforts to diligently develop markets for such products. The Geneva License Agreement specifies developmental milestones and the period of time during which such milestones must be completed and provides for an annual maintenance fee payable to Geneva.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 7 – ASSET PURCHASE AGREEMENT WITH TRIGEMINA

On June 11, 2020, the Company entered into an asset purchase agreement (the "Trigemina Asset Purchase Agreement") with Trigemina, Inc. ("Trigemina") and certain shareholders named therein (the "Executive Shareholders") pursuant to which Tonix acquired Trigemina assets related to migraine and pain treatment technologies (the "Trigemina Assets"). In connection with the acquisition of the Trigemina Assets, Tonix assumed Trigemina's rights and obligations under that certain Amended and Restated Exclusive License Agreement, dated November 30, 2007, as amended, by and between Trigemina and The Board of Trustees of the Leland Stanford Junior University ("Stanford") (the "Stanford License "Agreement") pursuant to an Assignment and Assumption Agreement with Stanford ("Assignment and Assumption Agreement"), dated June 11, 2020. As consideration for entering into the Asset Purchase Agreement, Tonix paid $824,759 to Trigemina and issued to Trigemina 2,000,000 shares of the Company's common stock, valued at $0.68 per share, based on the closing stock price on June 11, 2020, and paid Stanford $250,241 pursuant to the terms of the Assignment and Assumption Agreement. The common stock is unregistered and subject to a 12-month lock-up and a Shareholder Voting Agreement, dated June 11, 2020, pursuant to which Trigemina and the Executive Shareholders have agreed to vote the common stock on any matter put to a vote of the shareholders of the Company in accordance with management's recommendations. Both the costs associated with the cash payments and share issuance, totaling $2.4 million, were recorded to research and development expenses in the statement of operations for the year ended December 31, 2020. Because the Trigemina intellectual property was acquired prior to FDA approval, the cash and stock consideration, was expensed as research and development costs since there is no alternative future use and the acquired intellectual property does not constitute a business.

Pursuant to the terms of the Assignment and Assumption Agreement, Stanford has granted to Tonix an exclusive license, with the right to sublicense, certain patents related to the Trigemina Assets. Stanford has reserved for itself the right to practice under the patents for academic research and educational purposes. Tonix is obligated to use commercially reasonable efforts to diligently develop, manufacture, and sell products claimed or covered by the patent and will use commercially reasonable efforts to diligently develop markets for such products. The Trigemina License Agreement specifies developmental milestones and the period of time during which such milestones must be completed and provides for an annual maintenance fee payable to Stanford.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 8 – ASSET PURCHASE AGREEMENT WITH TRIMARAN

On August 19, 2019, the Company entered into an asset purchase agreement (the "Asset Purchase Agreement") with TRImaran Pharma, Inc. ("TRImaran") and the selling shareholders named therein (the "Selling Shareholders") pursuant to which Tonix acquired TRImaran's assets related to certain pyran-based compounds (the "Assets"). In connection with the acquisition of the Assets, Tonix entered into a First Amended and Restated Exclusive License Agreement (the "WSU License Agreement") with Wayne State University ("WSU") on August 19, 2019. As consideration for entering into the Asset Purchase Agreement, Tonix paid $100,000 to TRImaran and has assumed certain liabilities of TRImaran totaling $68,500. Upon the achievement of specified development, regulatory and sales milestones, Tonix also agreed to pay TRImaran and the Selling Shareholders, in restricted stock or cash, at Tonix's option, a total of approximately $3.4 million. Pursuant to the terms of the Asset Purchase Agreement, TRImaran and the Selling Shareholders are prohibited from disclosing confidential information related to the Assets and are restricted from engaging, for a period of three years, in the development or commercialization of any therapeutic containing any pyran-based drug compound for the treatment of post-traumatic stress disorder, attention deficit hyperactivity disorder or major depressive disorder. Also for a period of three years, if TRImaran or any Selling Shareholder engage in the research or development of any potential therapeutic compound for the treatment of any central nervous system disorder, TRImaran or such Selling Shareholder is obliged to provide notice and opportunity to Tonix to make an offer to acquire or license rights with respect to such product candidate.

Pursuant to the terms of the WSU License Agreement, WSU has granted to Tonix an exclusive license, with the right to sublicense, certain patents, technical information and material (collectively, the "Technology") related to the Assets. WSU has reserved for itself the right to practice the Technology for academic research and educational purposes. Tonix is obligated to use commercially reasonable efforts to obtain regulatory approval for one or more products utilizing the Technology ("WSU Products") and to use commercially reasonable marketing efforts throughout the term of the WSU License Agreement. The WSU License Agreement specifies developmental milestones and the period of time during which such milestones must be completed and provides for an annual maintenance fee payable to WSU. Tonix is obligated to substantially manufacture WSU Products in the United States if WSU Products will be sold in the United States.

Pursuant to the WSU License Agreement, Tonix has agreed to pay $75,000 to WSU as reimbursement of certain patent expenses, and, upon the achievement of specified development, regulatory and sales milestones, the Company also agreed to pay WSU, milestone payments totaling approximately $3.4 million. Tonix has also agreed to pay WSU single-digit royalties on net sales of WSU Products sold by Tonix or a sublicensee on a tiered basis based on net sales, and additional sublicense fees on certain consideration received from sublicensees. Royalties on each particular WSU Product are payable on a country-by-country and Product-by-Product basis until the date of expiration of the last valid claim in the last to expire of the issued patents covered by the WSU License Agreement. Royalties payable on net sales of WSU Products may be reduced by 50% of the royalties payable by Tonix to any third party for intellectual property rights which are necessary for the practice of the rights licensed to Tonix under the WSU License Agreement, provided that the royalty payable on a WSU Product may not be reduced by more than 50%. Each party also has the right to terminate the agreement for customary reasons such as material breach and bankruptcy. The WSU License Agreement contains provisions relating to termination, indemnification, confidentiality and other customary matters for an agreement of this kind.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 9 – LICENSE AGREEMENT WITH INSERM

On February 11, 2021, the Company entered into a license agreement (the "Inserm License Agreement") pursuant to which it licensed technology using oxytocin-based therapeutics for the treatment of Prader-Willi syndrome and non-organic failure to thrive disease from Inserm (the French National Institute of Health and Medical Research), Aix-Marseille Université and Centre Hospitalier Universitaire of Toulouse. The Inserm License Agreement provides for the payment of annual fees and milestone payments upon the occurrence of specified sales milestones totaling approximately $0.4 million, as well royalties on net sales of products based on the licensed technology, and assignment/transfer and sublicense royalties.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 10 – LICENSE AGREEMENTS WITH COLUMBIA UNIVERSITY

On September 16, 2019, the Company entered into an exclusive License Agreement (the "Columbia License Agreement") with the Trustees of Columbia University in the City of New York ("Columbia") pursuant to which Columbia granted to Tonix an exclusive license, with the right to sublicense, certain patents and technical information (collectively, the "TFF2 Technology") related to a recombinant Trefoil Family Factor 2 (TFF2), and to develop and commercialize products thereunder (each, a "TFF2 Product"). Pursuant to the terms of the Columbia License Agreement, Columbia reserved for itself the right to practice the TFF2 Technology for academic research and educational purposes.

The Company paid a five-digit license fee to Columbia as consideration for entering into the Columbia License Agreement, which was recorded to research and development expenses in the statement of operations for the year ended December 31, 2019. The Company is obligated to use Commercially Reasonable Efforts, as defined in the Columbia License Agreement, to develop and commercialize the TFF2 Product, and to achieve specified developmental milestones.

The Company agreed to pay Columbia single-digit royalties on net sales of (i) TFF2 Products sold by Tonix or a sublicensee and (ii) any other products that involve material or technical information related to the TFF2 Product and transferred to Tonix pursuant to the Columbia License Agreement ("Other Products") sold by Tonix or a sublicensee. Royalties on each particular TFF2 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 Columbia License Agreement, and (ii) a specified period of time after the first commercial sale of a TFF2 Product in the country in question. Royalties on each particular Other Product are payable on a country-by-country and product-by-product basis until a specified period of time after the first commercial sale of such particular Other Product in such country. Royalties payable on net sales of the TFF2 Product and Other Products may be reduced by 50% of the royalties payable by Tonix to any third party for intellectual property rights which are necessary for the practice of the rights licensed to Tonix under the Columbia 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 $4.1 million on a Product-by-Product basis upon the achievement of certain development, approval and sales milestones related to a TFF2 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 March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

On May 20, 2019, the Company entered into an exclusive License Agreement (the "License Agreement") with 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 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, was paid during the second quarter of 2020. Both installments of the license fee were recorded to research and development expenses in the 2019 statement of operations.

The Company 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 March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

NOTE 11 – SALE OF COMMON STOCK

February 2021 Financing

On February 8, 2021, the Company entered into a securities purchase agreement with certain institutional investors relating to the issuance and sale of 58,333,334 shares of its common stock, in a registered direct public offering ("the February 2021 Financing"), with A.G.P/Alliance Global Partners ("AGP"), acting as placement agent. The public offering price for each share of common stock was $1.20. The February 2021 Financing closed on February 9, 2021. AGP received a cash fee of 7% of the gross proceeds, for an aggregate of $4.9 million. The Company incurred other offering expenses of approximately $0.1 million. The Company received net proceeds of approximately $65.0 million, after deducting the fees and other offering expenses.

January 2021 Financing

On January 11, 2021, the Company entered into a securities purchase agreement with certain institutional investors relating to the issuance and sale of 50,000,000 shares of its common stock in a registered direct public offering ("the January 2021 Financing"), with AGP as placement agent. The public offering price for each share of common stock was $0.80. The January 2021 Financing closed on January 13, 2021. AGP received a cash fee of 7% of the gross proceeds, for an aggregate of $2.8 million. The Company incurred other offering expenses of approximately $0.3 million. The Company received net proceeds of approximately $36.9 million, after deducting the fees and other offering expenses.

At-the-Market Offerings

On April 8, 2020, the Company entered into a sales agreement (the "Sales Agreement") with AGP pursuant to which the Company may issue and sell, from time to time, shares of the Company's common stock having an aggregate offering price of up to $50.0 million in at-the-market offerings ("ATM") sales. On the same day, the Company filed a prospectus supplement under a shelf registration relating to the Sales Agreement. AGP will act as sales agent and will be paid a 3% commission on each sale under the Sales Agreement. The Company's common stock will be sold at prevailing market prices at the time of the sale, and, as a result, prices will vary. On September 4, 2020, the Company filed an amended prospectus supplement under a shelf registration relating to the Sales Agreement to increase the aggregate offering price to $100.0 million in ATM sales under the Sales Agreement. During the quarter ended March 31, 2021, the Company sold approximately 9.5 million shares of common stock under the Sales Agreement, for gross proceeds of approximately $7.0 million. Subsequent to March 31, 2021, the Company has sold 2.6 million shares of common stock under the Sales Agreement, for gross proceeds of approximately $3.2 million. On April 19, 2021, the Company filed an amended prospectus supplement under a shelf registration relating to the Sales Agreement to increase the aggregate offering price to $170.0 million in ATM sales under the Sales Agreement.

March 2020 Financing

On February 28, 2020, the Company entered into an underwriting agreement with AGP, relating to the issuance and sale of 14,550,000 shares of common stock, in a registered direct public offering ("the March 2020 Financing"). The public offering price for each share of common stock was $1.10. The March 2020 Financing closed on March 3, 2020. AGP purchased the shares at a seven percent discount to the then current public price, for an aggregate discount of $1.1 million. The Company incurred other offering expenses of approximately $0.1 million. The Company received net proceeds of approximately $14.8 million, after deducting the underwriting discount and other offering expenses.

February 2020 Financing

On February 7, 2020, the Company entered into an underwriting agreement with AGP pursuant to which the Company sold securities consisting of 3,837,000 Class A Units at a public offering price of $0.57 per unit, with each unit consisting of one share of common stock and one warrant to purchase one share of common stock, and 5,313 Class B Units at a public offering price of $1,000 per unit, with each unit consisting of one share of Series B Convertible Preferred Stock, with a conversion price of $0.57 per share, convertible into 1,754.386 shares of common stock and warrants to purchase 1,754.386 shares of common stock ("the February 2020 Financing"). The warrants have an exercise price of $0.57, are immediately exercisable and expire five years from the date of issuance.

The February 2020 Financing closed on February 11, 2020. AGP purchased the Class A and Class B Units at a seven-percent discount to the public offering price, for an aggregate discount of approximately $0.5 million. The Company incurred other offering expenses of approximately $0.5 million. The Company received net proceeds of approximately $6.5 million, after deducting the underwriting discount and other offering expenses.

After allocating proceeds to the warrants issued with the Series B Convertible Preferred Stock, the effective conversion price of the Series B Convertible Preferred Stock was determined to be less than the fair value of the underlying common stock at the date of commitment, resulting in a beneficial conversion feature ("BCF") at that date. Since the Series B Preferred Stock has no stated maturity or redemption date and is immediately convertible at the option of the holder, the discount created by the BCF of $1.3 million, based on intrinsic value, was charged to additional paid in capital as a non-cash "deemed dividend" and included in net loss to common stockholders.

During the first quarter of 2020, all 5,313 shares of Series B Convertible Preferred Stock were converted into common stock.

During February and March 2020, 10.8 million of the warrants issued in the February 2020 Financing, with an exercise price of $0.57, were exercised for proceeds of approximately $6.2 million.

November 2019 Financing

On November 14, 2019, the Company entered into an underwriting agreement with AGP pursuant to which the Company sold securities consisting of 547,420 Class A Units at a public offering price of $1.94 per unit, with each unit consisting of one share of common stock, one warrant to purchase one share of common stock ("primary warrant") and one-half of one warrant to purchase one half of one share common stock ("common warrant"), and 7,938 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 $1.94 per share, convertible into 515.464 shares of common stock, primary warrants to purchase 515.464 shares of common stock, and common warrants to purchase 257.732 shares of common stock (the "November 2019 Financing"). The primary warrants have an exercise price of $1.94, are immediately exercisable and expire five years from the date of issuance. The common warrants have an exercise price of $1.94, are exercisable and expire 12 months from the date of issuance. The common warrants are exercisable on a cashless basis at the option of the holder on the earlier of 30 days from issuance and the date by which an aggregate of $9.0 million of our securities were traded.

The November 2019 Financing closed on November 19, 2019. AGP purchased the Class A and Class B Units at a seven-percent discount to the public offering price, for an aggregate discount of approximately $0.6 million. The Company incurred other offering expenses of approximately $0.5 million. The Company received net proceeds from the November 2019 Financing of approximately $7.9 million, after deducting the underwriting discount and other offering expenses.

After allocating proceeds to the warrants issued with the Series A Convertible Preferred Stock, the effective conversion price of the Series A Convertible Preferred Stock was determined to be less than the fair value of the underlying common stock at the date of commitment, resulting in a BCF at that date. Since the Series A Preferred Stock has no stated maturity or redemption date and is immediately convertible at the option of the holder, the discount created by the BCF of $2.5 million, based on the intrinsic value, was charged to additional paid in capital as a non-cash "deemed dividend" and included in net loss to common stockholders.

As of December 31, 2019, all 7,938 shares of Series A Convertible Preferred Stock were converted into common stock.

As a result of the issuance of common stock in February 2020 for less than the November 2019 warrant exercise price, a repricing of the warrants issued in the November 2019 Financing was triggered. The Company recognized a one-time non-cash "deemed dividend" of $0.5 million, representing the increase in the fair value of the warrants. The non-cash "deemed dividend" was charged to additional paid in capital and included in net loss to stockholders. During February and March 2020, 2.3 million of the warrants issued in the November 2019 financing, with an exercise price of $0.57, were exercised for proceeds of approximately $1.3 million.

NOTE 12 – STOCK-BASED COMPENSATION

Stock Incentive Plans

On May 3, 2019, the Company's stockholders approved the Tonix Pharmaceuticals Holding Corp. 2019 Stock Incentive Plan (the "2019 Plan"). The 2019 Plan provided for the issuance of up to 140,000 shares of common stock. With the adoption of the 2020 Plan (as defined below), no further grants may be made under the 2019 Plan. On January 16, 2020, the Company's stockholders approved the Tonix Pharmaceuticals Holding Corp. 2020 Stock Incentive Plan (the "2020 Plan"). The 2020 Plan provided for the issuance of up to 600,000 shares of common stock. With the adoption of the Amended and Restated 2020 Plan (as defined below), no further grants may be made under the 2020 Plan.

On May 1, 2020, the Company's stockholders approved the Tonix Pharmaceuticals Holding Corp. Amended and Restated 2020 Stock Incentive Plan ("Amended and Restated 2020 Plan"), and together with the 2020 Plan and the 2019 Plan, the "Plans").

Under the terms of the Amended and Restated 2020 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 Amended and Restated 2020 Plan initially provided for the issuance of up to 10,000,000 shares of common stock, which amount will be increased to the extent that awards granted under the Plans are forfeited, expire or are settled for cash (except as otherwise provided in the Amended and Restated 2020 Plan). In addition, the Amended and Restated 2020 Plan contains an "evergreen provision" providing for an annual increase in the number of shares of our common stock available for issuance under the Amended and Restated 2020 Plan on January 1 of each year for a period of ten years, commencing on January 1, 2021 and ending on (and including) January 1, 2030, in an amount equal to the difference between (x) twenty percent (20%) of the total number of shares of common stock outstanding on December 31st of the preceding calendar year, and (y) the total number of shares of common stock reserved under the Amended and Restated 2020 Plan on December 31st of such preceding calendar year (including shares subject to outstanding awards, issued pursuant to awards or available for future awards). The Board of Directors determines the exercise price, vesting and expiration period of the grants under the Amended and Restated 2020 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 Amended and Restated 2020 Plan may not be more than ten years. As of March 31, 2021, 18,883,676 shares were available for future grants under the Amended and Restated 2020 Plan.

General

A summary of the stock option activity and related information for the Plans for the three months ended March 31, 2021 is as follows:

	Shares	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term	Aggregate Intrinsic Value
Outstanding at December 31, 2020	10,209,286	$ 2.93	9.26	$ 131,558
Grants	12,774,310	$ 1.34		
Exercised	—	—		
Forfeitures or expirations	(243)	2,937.37		
Outstanding at March 31, 2021	22,983,353	$ 2.02	9.51	$ 5,198,480
Exercisable at March 31, 2021	362,874	$ 54.08	7.04	$ 210,218

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 for the three-month periods ended March 31, 2021 and 2020 was $1.10 and $0.35 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. The fair value of the award is measured on the grant date. One-third of most stock options granted pursuant to the Plans vest 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. The Company also issues premium options to executive officers which have an exercise price greater than the grant date fair value and has issued performance-based options which vest when target parameters are met or probable of being met, 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 service period using the straight-line method.

The assumptions used in the valuation of stock options granted during the three months ended March 31, 2021 and 2020 were as follows:

	Three Months Ended March 31, 2021	Three Months Ended March 31, 2020
Risk-free interest rate	1.00% to 1.34%	0.49% to 1.25%
Expected term of option	6.00 years	5.50 to 6.00 years
Expected stock price volatility	132.23% to 132.78%	124.11% to 127.83%
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 $1.2 million, of which $0.8 million and $0.4 million, related to General and Administration and Research and Development, respectively was recognized for the quarter ended March 31, 2021.

Stock-based compensation expense relating to options granted of $0.4 million, of which $0.3 million and $0.1 million, related to General and Administration and Research and Development, respectively was recognized for the quarter ended March 31, 2020.

As of March 31, 2021, the Company had approximately $18.4 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 2.67 years.

Employee Stock Purchase Plans

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 2020 ESPP, as defined below, by the stockholders, no further grants may be made under the 2019 ESPP Plan. On May 1, 2020, the Company's stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2020 Employee Stock Purchase Plan (the "2020 ESPP").

The 2020 ESPP allows eligible employees to purchase up to an aggregate of 300,000 shares of the Company's common stock. Under the 2020 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 2020 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 2020 ESPP, subject to the statutory limit under the Code. As of March 31, 2021, 245,553 shares were available for future sales under the 2020 ESPP.

The 2020 and 2019 ESPP are considered compensatory plans with the related compensation cost expensed over the six-month offering period. For the quarters ended March 31, 2021 and 2020, $47,000 and $0, respectively were expensed. In January 2020, 1,578 shares that were purchased as of December 31, 2019, under the 2019 ESPP, were issued. Accordingly, during the first quarter of 2020, approximately $2,000 of employee payroll deductions accumulated at December 31, 2019, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $7,000 was returned to the employees. As of December 31, 2020, approximately $32,000 of employee payroll deductions have accumulated and have been recorded in accrued expenses. In January 2021, 54,447 shares that were purchased as of December 31, 2020, under the 2020 ESPP, were issued. Accordingly, during the first quarter of 2021, approximately $28,000 of employee payroll deductions accumulated at December 31, 2020, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $4,000 was returned to the employees.

NOTE 13 – WARRANTS TO PURCHASE COMMON STOCK

The following table summarizes information with respect to outstanding warrants to purchase common stock of the Company at March 31, 2021:

Exercise Price	Number Outstanding	Expiration Date
$ 0.50	24,920	November 2024
$ 0.57	123,500	February 2025
$ 35.00	490,571	December 2023
$ 630.00	5,441	October 2021
$ 687.50	474	October 2021
	644,906	

During the quarter ended March 31, 2021, 3,400 warrants from the February 2020 Financing, with an exercise price of $0.57, were exercised for proceeds of approximately $2,000.

During the quarter ended March 31, 2020, 2.3 million warrants from the November 2019 Financing, with an exercise price of $0.57, were exercised for proceeds of approximately $1.3 million.

During the quarter ended March 31, 2020, 10.8 million warrants from the February 2020 Financing, with an exercise price of $0.57, were exercised for proceeds of approximately $6.2 million.

NOTE 14 – 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 March 31, 2021, the Company has right-of-use assets of $0.9 million and a total lease liability for operating leases of $1.0 million of which $0.6 million is included in long-term lease liabilities and $0.4 million is included in current lease liabilities.

At March 31, 2021, 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 2021	$ 350
2022	186
2023	158
2024	145
2025	149
	988
Included interest	(25)
	$ 963

During the quarter ended March 31, 2020, the Company entered into a lease amendment, resulting in the Company recognizing an operating lease liability of approximately $35,000 based on the present value of the future minimum rental payments. The Company also recognized corresponding ROU assets of approximately $35,000. No new and amendments to operating leases were entered into by the Company during the quarter ended March 31, 2021.

Operating lease expense was $0.2 and $0.1 million for the quarters ended March 31, 2021 and 2020, respectively.

Other information related to leases is as follows:

Cash paid for amounts included in the measurement of lease liabilities:	**Three Months Ended March 31, 2021**	**Three Months Ended March 31, 2020**
Operating cash flow from operating leases (in thousands)	$ 158	$ 115
Weighted Average Remaining Lease Term		
Operating leases	3.54 years	0.84 years
Weighted Average Discount Rate		
Operating leases	1.47%	3.52%

NOTE 15 – COMMITMENTS

Contractual agreements

The Company has entered into contracts with various contract research organizations with outstanding commitments aggregating approximately $30.0 million at March 31, 2021 for future work to be performed.

On March 3, 2021, the Company entered into a $2.9 million contingent non-binding Purchase and Sales Agreement in connection with a property in Massachusetts. The property is intended for process development activities.

Defined contribution plan

The Company established 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. For the three months ended March 31, 2021 and 2020, the Company charged operations $70,000 and $50,000, respectively, for contributions under the 401(k) Plan.

NOTE 16 – SUBSEQUENT EVENTS

On April 14, 2021, the Company and OyaGen, Inc. ("OyaGen") entered into an exclusive License Agreement (the "OyaGen License Agreement") pursuant to which OyaGen granted to Tonix an exclusive license to certain patents and technical information related to an antiviral inhibitor of SARS-CoV-2, sangivamycin, and to develop and commercialize products thereunder, and to acquire rights to any technology based on the thereon for the prevention or treatment of Covid-19 developed by OyaGen during the term of the License Agreement.

As consideration for entering into the License Agreement, Tonix agreed to pay a low-seven digit license fee to OyaGen, and agreed to issue to OyaGen and an affiliated entity an aggregate of 2,752,294 shares of the Company's common stock, which is unregistered and subject to a six-month lock-up and a voting agreement, pursuant to which OyaGen and the affiliated entity have agreed to vote the common stock on any matter put to a vote of the shareholders of the Company in accordance with management's recommendations. The OyaGen License also provides for single-digit royalties and contingent milestone payments.

Subsequent to March 31, 2021, the Company has sold 2.6 million shares of common stock under the ATM Sales Agreement, for gross proceeds of approximately $3.2 million.

On April 19, 2021, the Company filed an amended prospectus supplement under a shelf registration relating to the ATM Sales Agreement to increase the aggregate offering price to $170.0 million in ATM sales under the ATM Sales Agreement.

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 its 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.

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. 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: the COVID-19 pandemic, including its impact on the Company, 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, licensing, acquiring and developing small molecules and biologics to treat and prevent human disease and alleviate suffering. Tonix's portfolio is primarily composed of central nervous system, or CNS, and immunology product candidates. The CNS portfolio includes both small molecules and biologics to treat pain, neurologic, psychiatric and addiction conditions. The immunology portfolio includes vaccines to prevent infectious diseases and biologics to address organ rejection, cancer, and autoimmune diseases. Our lead programs are TNX-102 SL*, a sublingual tablet for the management of fibromyalgia, or FM, and TNX-1800**, a live replicating virus vaccine to protect against COVID-19.

Our most advanced CNS product candidate is TNX-102 SL*, a proprietary sublingual tablet formulation of cyclobenzaprine, or CBP, designed for bedtime administration. TNX-102 SL has active investigational new drug applications, or IND's, for FM, posttraumatic stress disorder, or PTSD, agitation in Alzheimer's disease, or AAD, and alcohol use disorder, or AUD. TNX-102 SL is in mid-Phase 3 development for the management of FM which is a pain disorder characterized by chronic widespread pain, non-restorative sleep, fatigue and impaired cognition. We reported positive results from its Phase 3 RELIEF study in December 2020 and expect interim analysis data from a second Phase 3 study, RALLY, in the third quarter of 2021[1], followed by topline data in the first quarter of 2022. We completed enrollment of 50% of participants in the RALLY study in March 2021. For TNX-102 SL in PTSD, we completed the Phase 3 RECOVERY trial and reported topline results in the fourth quarter of 2020 in which TNX-102 SL did not meet the primary efficacy endpoint. As a next step, we intend to meet with the U.S. Food and Drug Administration, or FDA, to discuss potential new endpoints for the indication of treatment of PTSD. We expect to begin enrolling a Phase 3 study of TNX-102 SL in police in Kenya in the third quarter of 2021. PTSD is a serious psychiatric condition that develops in response to experiencing a traumatic event. The AAD program is Phase 2 ready with an active IND and FDA Fast Track designation. AAD, which includes emotional lability, restlessness, irritability, and aggression, is one of the most distressing and debilitating of the behavioral complications of Alzheimer's disease. The AUD program is also Phase 2 ready with an active IND. AUD is a chronic relapsing brain disease characterized by compulsive alcohol use, loss of control over alcohol intake, and a negative emotional state when not using alcohol.

Other CNS candidates in development include TNX-1900* (intranasal potentiated oxytocin), which is in development as a candidate for prophylaxis of chronic migraine and for the treatment of craniofacial pain, insulin resistance and related conditions. TNX-1900 was acquired from Trigemina, Inc. in 2020 and licensed from Stanford University in 2020. We intend to submit an IND to the FDA in the third quarter of 2021 and initiate a Phase 2 study in migraine in the third quarter of 2021. Tonix also licensed technology to use TNX-1900 for the treatment of insulin resistance from the University of Geneva. TNX-2900* is another intranasal oxytocin-based therapeutic in development for the treatment of Prader-Willi syndrome, or PWS. The technology for TNX-2900 was licensed from the French National Institute of Health and Medical Research. PWS, an orphan condition, is a rare genetic disorder of failure to thrive in infancy, associated with uncontrolled appetite later in life.

TNX-601 CR* (tianeptine oxalate and naloxone controlled-release tablets) is another CNS product candidate in development as a treatment for major depressive disorder, or depression, as well as for PTSD and neurocognitive dysfunction associated with corticosteroid use. We completed a Phase 1 trial for formulation development outside of the U.S. Based on official minutes from a pre-IND meeting with the FDA, we expect to be in a position to initiate a Phase 2 study for the treatment of depression in the fourth quarter of 2021, pending results of toxicology studies.

TNX-1300** (double-mutant cocaine esterase) is also in Tonix's CNS portfolio and is in Phase 2 development for the treatment of life-threatening cocaine intoxication. TNX-1300 has been granted Breakthrough Therapy designation, or BTD by the FDA. TNX-1300 was licensed from Columbia University in 2019 after a Phase 2 study showed that it rapidly and efficiently disintegrates cocaine in the blood of volunteers who had received intravenous, or *i.v.*, cocaine. We expect to initiate a Phase 2 open-label safety study of TNX-1300 in an emergency room setting in the third quarter of 2021.

Our immunology portfolio includes vaccines to prevent infectious diseases and biologics to address organ rejection, cancer, and autoimmune diseases. Our lead vaccine candidate, TNX-1800**, is a live replicating vaccine based on the horsepox viral vector platform to protect against COVID-19, primarily by eliciting a T cell immune response. We reported positive immune response data in non-human primates in the fourth quarter of 2020 and reported positive efficacy data from animal challenge studies using live SARS-CoV-2 in the first quarter of 2021. TNX-801**, a live horsepox virus vaccine for percutaneous administration, is in the pre-IND stages of development to protect against smallpox and monkeypox. Both TNX-1800 and TNX-801 are based on the proprietary horsepox viral vector platform. We expect to initiate a Phase 1 safety study of TNX-1800 for COVID-19 in the first half of 2022.

TNX-2100** is a skin test we are developing to measure SARS-CoV-2 exposure and T cell immunity. It is an intradermal test to measure delayed-type hypersensitivity (DTH) response to SARS-CoV-2. We have manufactured GMP peptides designed to stimulate SARS-CoV-2 specific T cells and expect to submit an IND to the FDA in the third quarter of 2021 and initiate a first-in-human clinical study in the fourth quarter of 2021.

TNX-3500* (sangivamycin) is an antiviral inhibitor of SARS-CoV-2. It has demonstrated broad-spectrum activity in laboratory-based assays against the coronaviruses SARS-CoV-2 and MERS-CoV. Tonix licensed this compound from OyaGen, Inc. and intends to develop it as a treatment for COVID-19 and potentially other viral disorders. The active ingredient of TNX-3500 has been studied for safety in humans in prior studies on cancer patients at the U.S. National Cancer Institute but has not been approved for marketing in any jurisdiction. Tonix intends to conduct further animal studies and submit an IND in the first half of 2022.

TNX-1500** is a humanized monoclonal antibody, or mAb, directed against CD40-ligand, or CD40L, engineered to modulate binding to Fc receptors, that is being developed to prevent and treat organ transplant rejection as well as to treat autoimmune conditions. We expect to have GMP TNX-1500 product ready in the third quarter of 2021. In experiments at the Massachusetts General Hospital, a teaching hospital of Harvard Medical School, TNX-1500 product candidate is being studied as monotherapy or in combination with mycophenolate mofetil in heart and kidney organ transplants in non-human primates. Preliminary results from an ongoing experiment in heart transplants indicated that TNX-1500 appeared to have comparable efficacy to historical experiments using the chimeric mouse-human anti-CD40L monoclonal antibody (mAb) hu5c8 and no evidence of thrombosis has been observed.

Finally, our preclinical pipeline includes TNX-1600*, TNX-1700**, TNX-701* and TNX-2300**. TNX-1600 is an inhibitor of the reuptake of neurotransmitters serotonin, norepinephrine and dopamine (a triple reuptake inhibitor). TNX-1600 was licensed from Wayne State University in 2019 and is being developed as a treatment for PTSD, depression and attention-deficit/hyperactivity disorder, or ADHD. TNX-1700 is a recombinant modified form of Trefoil Family Factor 2, or rTFF2, that was licensed from Columbia University in 2019, and is a biologic being developed to treat gastric and pancreatic cancers. TNX-701 is an undisclosed small molecule, which is being developed to prevent deleterious effects of radiation exposure which has the potential to be used as a medical countermeasure to improve biodefense. Tonix is also developing TNX-2300** as a second COVID-19 vaccine under an option agreement with Kansas State university. TNX-2300 is a live replicating viral vector based on the bovine parainfluenza virus.

[1]Pending agreement from FDA on statistical analysis plan.

*TNX-102 SL, TNX-601 CR, TNX-1600, TNX-1900, TNX-2900, TNX-3500 and TNX-701 are investigational new drugs and have not been approved for any indication.

**TNX-1800, TNX-801, TNX-2300, TNX-2100, TNX-1300, TNX-1500 and TNX-1700 are investigational new biologics and have not been approved for any indication.

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 March 31, 2021 Compared to Three Months Ended March 31, 2020

Research and Development Expenses. Research and development expenses for the three months ended March 31, 2021 were $15.3 million, an increase of $10.6 million, or 226%, from $4.7 million for the three months ended March 31, 2020. This increase is predominately due to timing of milestones related to the Phase 3 RELIEF study and the initiation of a second phase 3 study of TNX-102 SL for FM, RALLY, in the third quarter of 2020, as well as activities to prepare for initiation of Phase 2 clinical studies of TNX-1300, TNX-1900 and TNX-601 by the end of 2021. New activities related to the development of TNX-1800 as a potential COVID-19 vaccine, and increased spending related to our development pipeline also contributed to the increase.

General and Administrative Expenses. General and administrative expenses for the three months ended March 31, 2021 were $5.4 million, an increase of $2.8 million, or 108%, from $2.6 million incurred in the three months ended March 31, 2020. The increase is primarily due to an increase in compensation expense of $0.7 million driven by increased salaries and additional personnel hired during the second half of 2020, an increase in legal fees of $0.6 million due to increased corporate legal fees and patent prosecution costs, increased financial reporting expenses of $1.0 million due to shareholder meetings held during the year, an increase in investor relations/public relations costs of $0.1 million, and an increase in insurance premiums of $0.1 million.

Net Loss. As a result of the forgoing, the net loss for the three months ended March 31, 2021 was $20.7 million, compared to a net loss of $7.3 million for the three months ended March 31, 2020, an increase of $13.4 million or 184%.

License Agreements

On April 14, 2021, we and OyaGen, Inc. ("OyaGen") entered into an exclusive License Agreement (the "OyaGen License Agreement") pursuant to which OyaGen granted us an exclusive license to certain patents and technical information related to an antiviral inhibitor of SARS-CoV-2, sangivamycin, and to develop and commercialize products thereunder, and to acquire rights to any technology based on the thereon for the prevention or treatment of Covid-19 developed by OyaGen during the term of the License Agreement.

As consideration for entering into the License Agreement, we agreed to pay a low-seven digit license fee to OyaGen, and agreed to issue to OyaGen and an affiliated entity an aggregate of 2,752,294 shares of our common stock, which is unregistered and subject to a six-month lock-up and a voting agreement, pursuant to which OyaGen and the affiliated entity have agreed to vote the common stock on any matter put to a vote of the shareholders of the Company in accordance with management's recommendations. The OyaGen License also provides for single-digit royalties and contingent milestone payments.

On February 11, 2021, we entered into a license agreement (the "Inserm License Agreement") pursuant to which we licensed technology using oxytocin-based therapeutics for the treatment of Prader-Willi syndrome and non-organic failure to thrive disease from Inserm (the French National Institute of Health and Medical Research), Aix-Marseille Université and Centre Hospitalier Universitaire of Toulouse. The Inserm License Agreement provides for the payment of annual fees and milestone payments upon the occurrence of specified sales milestones, totaling approximately $0.4 million, as well royalties on net sales of products based on the licensed technology, and assignment/transfer and sublicense royalties. As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

On September 16, 2019, we entered into an exclusive License Agreement (the "Columbia License Agreement") with the Trustees of Columbia University in the City of New York ("Columbia") pursuant to which Columbia granted to us an exclusive license, with the right to sublicense, certain patents and technical information (collectively, the "TFF2 Technology") related to a recombinant Trefoil Family Factor 2 (TFF2), and to develop and commercialize products thereunder (each, a "TFF2 Product"). Pursuant to the terms of the Columbia License Agreement, Columbia has reserved for itself the right to practice the TFF2 Technology for academic research and educational purposes.

We paid a five-digit license fee to Columbia as consideration for entering into the Columbia License Agreement, which was recorded to research and development expenses in the statement of operations for the year ended December 31, 2019. We are obligated to use Commercially Reasonable Efforts, as defined in the Columbia License Agreement, to develop and commercialize the TFF2 Product, and to achieve specified developmental milestones.

We have agreed to pay Columbia single-digit royalties on net sales of (i) TFF2 Products sold by us or a sublicensee and (ii) any other products that involve material or technical information related to the TFF2 Product and transferred to us pursuant to the License Agreement ("Other Products") sold by us or a sublicensee. Royalties on each particular TFF2 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 Columbia License Agreement, and (ii) a specified period of time after the first commercial sale of a TFF2 Product in the country in question. Royalties on each particular Other Product are payable on a country-by-country and product-by-product basis until a specified period of time after the first commercial sale of such particular Other Product in such country. Royalties payable on net sales of the TFF2 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 Columbia License Agreement, provided that the royalty payable on a TFF2 Product or Other Product may not be reduced by more than 50%.

We are also obligated to make contingent milestone payments to Columbia totaling $4.1 million on a Product-by-Product basis upon the achievement of certain development, approval and sales milestones related to a TFF2 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 March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

On May 20, 2019, we entered into an exclusive License Agreement (the "License Agreement") with 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 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 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, was paid during the second quarter of 2020. Both installments of the license fee were recorded to research and development expenses in the 2019 statement of operations.

We 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 March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

Asset Purchase Agreements

On December 22, 2020, we entered into an asset purchase agreement (the "Asset Purchase Agreement") with Katana Pharmaceuticals, Inc. ("Katana") pursuant to which we acquired Katana assets related to insulin resistance and related syndromes, including obesity (the "Katana Assets"). In connection with the acquisition of the Assets, we assumed Katana's rights and obligations under that certain Exclusive License Agreement by and between Katana and The University of Geneva ("Geneva") (the "Geneva License "Agreement") pursuant to an Assignment and Assumption Agreement with Geneva ("Geneva Assignment and Assumption Agreement"), dated December 22, 2020. As consideration for entering into the Asset Purchase Agreement, we paid $0.7 million to Katana. The costs associated with the cash payments were recorded to research and development expenses in the statement of operations for the year ended December 31, 2020. Because the Katana intellectual property was acquired prior to FDA, the cash consideration totaling $0.7 million, was expensed as research and development costs since there is no alternative future use and the acquired intellectual property does not constitute a business.

Pursuant to the terms of the Geneva Assignment and Assumption Agreement, Geneva granted us an exclusive license, with the right to sublicense, certain patents related to the Katana Assets. We are obligated to use commercially reasonable efforts to diligently develop, manufacture, and sell products claimed or covered by the patent and will use commercially reasonable efforts to diligently develop markets for such products. The Geneva License Agreement specifies developmental milestones and the period of time during which such milestones must be completed and provides for an annual maintenance fee payable to Geneva.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

On June 11, 2020, we entered into an asset purchase agreement (the "Trigemina Asset Purchase Agreement") with Trigemina, Inc. ("Trigemina") and certain shareholders named therein (the "Executive Shareholders") pursuant to which we acquired Trigemina assets related to migraine and pain treatment technologies (the "Trigemina Assets"). In connection with the acquisition of the Trigemina Assets, we assumed Trigemina's rights and obligations under that certain Amended and Restated Exclusive License Agreement, dated November 30, 2007, as amended, by and between Trigemina and The Board of Trustees of the Leland Stanford Junior University ("Stanford") (the "Stanford License "Agreement") pursuant to an Assignment and Assumption Agreement with Stanford ("Assignment and Assumption Agreement"), dated June 11, 2020. As consideration for entering into the Trigemina Asset Purchase Agreement, we paid $824,759 to Trigemina and issued to Trigemina 2,000,000 shares of our common stock and paid Stanford $250,241 pursuant to the terms of the Assignment and Assumption Agreement. The common stock is unregistered and subject to a 12 month lock-up and a Shareholder Voting Agreement, dated June 11, 2020, pursuant to which Trigemina and the Executive Shareholders have agreed to vote the common stock on any matter put to a vote of our shareholders in accordance with management's recommendations. Both the costs associated with the cash payments and share issuance, totaling $2.4 million, were recorded to research and development in the statement of operations for the year ended December 31, 2020. Because the Trigemina intellectual property was acquired prior to FDA approval, the cash and stock consideration was expensed as research and development costs since there is no alternative future use and the acquired intellectual property does not constitute a business.

Pursuant to the terms of the Assignment and Assumption Agreement, Stanford has granted us an exclusive license, with the right to sublicense, certain patents related to the Trigemina Assets. Stanford has reserved for itself the right to practice under the patents for academic research and educational purposes. We are obligated to use commercially reasonable efforts to diligently develop, manufacture, and sell products claimed or covered by the patent and will use commercially reasonable efforts to diligently develop markets for such products. The Stanford License Agreement specifies developmental milestones and the period of time during which such milestones must be completed, and provides for an annual maintenance fee payable to Stanford.

As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

On August 19, 2019, we entered into an asset purchase agreement (the "TRImaran Asset Purchase Agreement") with TRImaran Pharma, Inc. ("TRImaran") and the selling shareholders named therein (the "Selling Shareholders") pursuant to which we acquired TRImaran's assets related to certain pyran-based compounds (the "TRImaran Assets"). In connection with the acquisition of the TRImaran Assets, we entered into a First Amended and Restated Exclusive License Agreement (the "WSU License Agreement") with Wayne State University ("WSU") on August 19, 2019. As consideration for entering into the TRImaran Asset Purchase Agreement, we paid $100,000 to TRImaran and have assumed certain liabilities of TRImaran totaling $68,500. The $168,500 was recorded to research and development expenses in the statement of operations in 2019. Upon the achievement of specified development, regulatory and sales milestones, we also agreed to pay TRImaran and the Selling Shareholders, in restricted stock or cash, at our option, a total of approximately $3.4 million. Pursuant to the terms of the TRImaran Asset Purchase Agreement, TRImaran and the Selling Shareholders are prohibited from disclosing confidential information related to the TRImaran Assets and are restricted from engaging, for a period of three years, in the development or commercialization of any therapeutic containing any pyran-based drug compound for the treatment of post-traumatic stress disorder, attention deficit hyperactivity disorder or major depressive disorder. Also for a period of three years, if TRImaran or any Selling Shareholder engage in the research or development of any potential therapeutic compound for the treatment of any central nervous system disorder, TRImaran or such Selling Shareholder is obliged to provide notice and opportunity to Tonix to make an offer to acquire or license rights with respect to such product candidate. As of December 31, 2020, no milestone payments have been accrued or paid in relation to this agreement.

Pursuant to the terms of the WSU License Agreement, WSU granted us an exclusive license, with the right to sublicense, certain patents, technical information and material (collectively, the "Technology") related to the TRImaran Assets. WSU has reserved for itself the right to practice the Technology for academic research and educational purposes. We are obligated to use commercially reasonable efforts to obtain regulatory approval for one or more products utilizing the Technology ("WSU Products") and to use commercially reasonable marketing efforts throughout the term of the WSU License Agreement. The WSU License Agreement specifies developmental milestones and the period of time during which such milestones must be completed and provides for an annual maintenance fee payable to WSU. We are obligated to substantially manufacture WSU Products in the United States if WSU Products will be sold in the United States.

Pursuant to the WSU License Agreement, we paid $75,000 to WSU as reimbursement of certain patent expenses, and, upon the achievement of specified development, regulatory and sales milestones, we also agreed to pay WSU, milestone payments totaling approximately $3.4 million. We also agreed to pay WSU single-digit royalties on net sales of WSU Products sold by us or a sublicensee on a tiered basis based on net sales, and additional sublicense fees on certain consideration received from sublicensees. Royalties on each particular WSU Product are payable on a country-by-country and Product-by-Product basis until the date of expiration of the last valid claim in the last to expire of the issued patents covered by the WSU License Agreement. Royalties payable on net sales of WSU 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 WSU License Agreement, provided that the royalty payable on a WSU Product may not be reduced by more than 50%. Each party also has the right to terminate the agreement for customary reasons such as material breach and bankruptcy. The WSU License Agreement contains provisions relating to termination, indemnification, confidentiality and other customary matters for an agreement of this kind. As of March 31, 2021, no milestone payments have been accrued or paid in relation to this agreement.

Liquidity and Capital Resources

As of March 31, 2021, we had working capital of $167.1 million, comprised primarily of cash and cash equivalents of $164.2 million and prepaid expenses and other of $9.0 million, offset by $2.9 million of accounts payable, $2.8 million of accrued expenses and current lease liabilities of $0.4 million. A significant portion of the accounts payable and accrued expenses are due to work performed in relation to our Phase 3 clinical trial in FM and our vaccine program. For the three months ended March 31, 2021 and 2020, we used approximately $21.1 million and $9.3 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 outlays principally resulted from an increase in research and development and general and administrative activities. For the three months ended March 31, 2021 and 2020, net proceeds from financing activities were $108.7 million and $28.8 million, respectively, predominately from the sale of our common stock and warrants. Cash used by investing activities for the three months ended March 31, 2021 and 2020, was $0.5 million and $0 respectively, related to the purchase of property and equipment.

We believe that our cash resources at March 31, 2021, and the proceeds that we raised from equity offerings subsequent to the end of the first quarter of 2021, will meet our operating and capital expenditure requirements through March 31, 2022, but not beyond.

We continue to face significant challenges and uncertainties and, as a result, our available capital resources may be consumed more rapidly than currently expected due to changes we may make in our research and development spending plans. These factors raise substantial doubt about our ability to continue as a going concern for the one year period from the date of filing of this Form 10-K. We have the ability to obtain additional funding through public or private financing or collaborative arrangements with strategic partners to increase the funds available to fund operations. Without additional funds, we may be forced to delay, scale back or eliminate some of our research and development activities, or other operations and potentially delay product development in an effort to provide sufficient funds to continue our operations. If any of these events occurs, our ability to achieve our development and commercialization goals would be adversely affected.

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 and the buildout of our research and development operations and manufacturing. 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.

February 2021 Financing

On February 8, 2021, we entered into a securities agreement ("the February 2021 Financing") with A.G.P/Alliance Global Partners ("AGP"), relating to the issuance and sale of 58,333,334 shares of our common stock, in a registered direct public offering. The public offering price for each share of common stock was $1.20. The February 2021 Financing closed on February 9, 2021. AGP purchased the shares at a seven percent discount to the then current public price, for an aggregate discount of $4.9 million. We incurred other offering expenses of approximately $0.1 million. We received net proceeds of approximately $65.0 million, after deducting the underwriting discount and other offering expenses.

January 2021 Financing

On January 11, 2021, we entered into a securities purchase agreement ("the January 2021 Financing") with AGP, relating to the issuance and sale of 50,000,000 shares of our common stock, in a registered direct public offering. The public offering price for each share of common stock was $0.80. The January 2021 Financing closed on January 13, 2021. AGP purchased the shares at a seven percent discount to the then current public price, for an aggregate discount of $2.8 million. We incurred other offering expenses of approximately $0.3 million. We received net proceeds of approximately $36.9 million, after deducting the underwriting discount and other offering expenses.

At-the-Market Offering

On April 8, 2020, we entered into a sales agreement (the "Sales Agreement") with AGP pursuant to which we may issue and sell, from time to time, shares of the our common stock having an aggregate offering price of up to $50.0 million in at-the-market offerings ("ATM") sales. On the same day, we filed a prospectus supplement under a shelf registration relating to the Sales Agreement. AGP will act as sales agent and will be paid a 3% commission on each sale under the Sales Agreement. Our common stock will be sold at prevailing market prices at the time of the sale, and, as a result, prices will vary. On September 4, we filed an amended prospectus supplement under a shelf registration relating to the Sales Agreement to increase the aggregate offering price to $100.0 million in ATM sales under the Sales Agreement. During the quarter ended March 31, 2021, we sold approximately 9.5 million shares of common stock under the Sales Agreement, for gross proceeds of approximately $7.0 million. Subsequent to March 31, 2021, we sold 2.6 million shares of common stock under the Sales Agreement, for gross proceeds of approximately $3.2 million. On April 19, 2021, we filed an amended prospectus supplement under a shelf registration relating to the Sales Agreement to increase the aggregate offering price to $170.0 million in ATM sales under the Sales Agreement.

March 2020 Financing

On February 28, 2020, we entered into an underwriting agreement ("the February 28th Financing") with AGP, relating to the issuance and sale of 14,550,000 shares of our common stock, in a registered direct public offering. The public offering price for each share of common stock was $1.10. The February 28th Financing closed on March 3, 2020. AGP purchased the shares at a seven percent discount to the then current public price, for an aggregate discount of $1.1 million. We incurred other offering expenses of approximately $0.1 million. We received net proceeds of approximately $14.8 million, after deducting the underwriting discount and other offering expenses.

February 2020 Financing

On February 7, 2020, we entered into an underwriting agreement ("the February 20 Financing") with AGP pursuant to which we sold securities consisting of 3,837,000 Class A Units at a public offering price of $0.57 per unit, with each unit consisting of one share of common stock and one warrant to purchase one share of common stock, and 5,313 Class B Units at a public offering price of $1,000 per unit, with each unit consisting of one share of Series B Convertible Preferred Stock, with a conversion price of $0.57 per share, convertible into 1,754.386 shares of common stock and warrants to purchase 1,754.386 shares of our common stock. The warrants have an exercise price of $0.57, are immediately exercisable and expire five years from the date of issuance.

The February 2020 Financing closed on February 11, 2020. AGP purchased the Class A and Class B Units at a seven-percent discount to the public offering price, for an aggregate discount of approximately $0.5 million. We incurred other offering expenses of approximately $0.5 million. We received net proceeds of approximately $6.5 million, after deducting the underwriting discount and other offering expenses.

After allocating proceeds to the warrants issued with the Series B Convertible Preferred Stock, the effective conversion price of the Series B Convertible Preferred stock was determined to be less than the fair value of the underlying common stock at the date of commitment, resulting in a beneficial conversion feature ("BCF") at that date. Since the Series B Preferred Stock has no stated maturity or redemption date and is immediately convertible at the option of the holder, the discount created by the BCF of $1.3 million, based on intrinsic value, was charged to additional paid in capital as a "deemed dividend" and included in net loss to common stockholders.

During the first quarter of 2020, all 5,313 shares of Series B Convertible Preferred Stock were converted into common stock.

During February and March 2020, 10.8 million of the warrants issued in the February 2020 Financing, with an exercise price of $0.57, were exercised for proceeds of approximately $6.2 million.

November 2019 Financing

On November 14, 2019, we entered into an underwriting agreement with AGP pursuant to which we sold securities consisting of 547,420 Class A Units at a public offering price of $1.94 per unit, with each unit consisting of one share of common stock, one warrant to purchase one share of common stock ("primary warrant") and one-half of one warrant to purchase one half of one share common stock ("common warrant"), and 7,938 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 $1.94 per share, convertible into 515.464 shares of common stock, primary warrants to purchase 515.464 shares of common stock, and common warrants to purchase 257.732 shares of our common stock. The primary warrants have an exercise price of $1.94, are immediately exercisable and expire five years from the date of issuance. The common warrants have an exercise price of $1.94, are exercisable and expire 12 months from the date of issuance. The common warrants are exercisable on a cashless basis at the option of the holder on the earlier of 30 days from issuance and the date by which an aggregate of $9.0 million of our securities were traded.

The November 2019 Financing closed on November 19, 2019. AGP purchased the Class A and Class B Units at a seven-percent discount to the public offering price, for an aggregate discount of approximately $0.6 million. We incurred other offering expenses of approximately $0.5 million. We received net proceeds from the November 2019 Financing of approximately $7.9 million, after deducting the underwriting discount and other offering expenses.

After allocating proceeds to the warrants issued with the Series A Convertible Preferred Stock, the effective conversion price of the Series A Convertible Preferred Stock was determined to be less than the fair value of the underlying common stock at the date of commitment, resulting in a BCF at that date. Since the Series A Preferred Stock has no stated maturity or redemption date and is immediately convertible at the option of the holder, the discount created by the BCF of $2.5 million, based on the intrinsic value, was charged to additional paid in capital as a "deemed dividend" and included in net loss to common stockholders.

As of December 31, 2019, all 7,938 shares of Series A Convertible Preferred Stock were converted into common stock.

With the February 2020 Financing, warrants that were issued as part of the November 2019 financing were repriced at $0.57. As a result of the issuance of common stock in February 2020 for less than the November 2019 warrant exercise price, a repricing of the warrants issued in the November 2019 financing was triggered. We recognized a one-time non-cash "deemed dividend" of $0.5 million, representing the increase in the fair value of the warrants. The "deemed dividend" was charged to additional paid in capital and included in net loss to stockholders. During February and March 2020, 2.3 million of the warrants issued in the November 2019 financing, with an exercise price of $0.57, were exercised for proceeds of approximately $1.3 million.

Stock Compensation

Stock Incentive Plans

2019 Stock Incentive Plan

On May 3, 2019, our stockholders approved the Tonix Pharmaceuticals Holding Corp. 2019 Stock Incentive Plan (the "2019 Plan"). The 2019 Plan provided for the issuance of up to 140,000 shares of common stock. With the adoption of the Amended and Restated 2020 Plan (as defined below), no further grants may be made under the 2019 Plan. On January 16, 2020, our stockholders approved the Tonix Pharmaceuticals Holding Corp. 2020 Stock Incentive Plan (the "2020 Plan"). The 2020 Plan provided for the issuance of up to 600,000 shares of common stock. With the adoption of the Amended and Restated 2020 Stock Incentive Plan, no further grants may be made under the 2020 Plan.

On May 1, 2020, our stockholders approved the Tonix Pharmaceuticals Holding Corp. Amended and Restated 2020 Stock Incentive Plan ("Amended and Restated 2020 Plan"), and together with the 2020 Plan and the 2019 Plan, the "Plans").

Under the terms of the Amended and Restated 2020 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 Amended and Restated 2020 Plan provides for the issuance of up to 10,000,000 shares of common stock, which amount will be increased to the extent that awards granted under the Plans are forfeited, expire or are settled for cash (except as otherwise provided in the Amended and Restated 2020 Plan). In addition, the Amended and Restated 2020 Plan contains an "evergreen provision" providing for an annual increase in the number of shares of our common stock available for issuance under the Amended and Restated 2020 Plan on January 1 of each year for a period of ten years, commencing on January 1, 2021 and ending on (and including) January 1, 2030, in an amount equal to the difference between (x) twenty percent (20%) of the total number of shares of common stock outstanding on December 31st of the preceding calendar year, and (y) the total number of shares of common stock reserved under the Amended and Restated 2020 Plan on December 31st of such preceding calendar year (including shares subject to outstanding awards, issued pursuant to awards or available for future awards). The Board of Directors determines the exercise price, vesting and expiration period of the grants under the Amended and Restated 2020 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 Amended and Restated 2020 Plan may not be more than ten years. As of March 31, 2021, 18,883,676 shares were available for future grants under the Amended and Restated 2020 Plan.

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 below, and the closing market price of our common stock on the date of the grant. The fair value of the award is measured on the grant date. One-third of most stock options granted pursuant to the Plans vest 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. We also issue premium options to executive officers which have an exercise price greater than the grant date fair value and have issued performance-based options which vest when target parameters are met, 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 weighted average fair value of options granted for the three-month periods ended March 31, 2021 and 2020 was $1.10 and $0.35 per share, respectively.

Stock-based compensation expense relating to options granted of $1.2 million, of which $0.8 million and $0.4 million, related to General and Administration and Research and Development, respectively was recognized for the quarter ended March 31, 2021.

Stock-based compensation expense relating to options granted of $0.4 million, of which $0.3 million and $0.1 million, related to General and Administration and Research and Development, respectively was recognized for the quarter ended March 31, 2020.

As of March 31, 2021, we had approximately $18.4 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 2.67 years.

Employee Stock Purchase Plan

On May 3, 2019, our stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2019 Employee Stock Purchase Plan (the "2019 ESPP"). As a result of adoption of the 2020 ESPP, as defined below, by the stockholders, no further grants may be made under the 2019 ESPP Plan. On May 1, 2020, our stockholders approved the Tonix Pharmaceuticals Holdings Corp. 2020 Employee Stock Purchase Plan (the "2020 ESPP").

The 2020 ESPP allows eligible employees to purchase up to an aggregate of 300,000 shares of our common stock. Under the 2020 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 our common stock at the end of the offering period. Each offering period under the 2020 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 2020 ESPP, subject to the statutory limit under the Code. As of March 31, 2021, 245,553 shares were available for future sales under the 2020 ESPP.

The 2020 and 2019 ESPP are considered compensatory plans with the related compensation cost expensed over the six-month offering period. For the quarter ended March 31, 2021 and 2020, $47,000 and $0, respectively were expensed. In January 2020, 1,578 shares that were purchased as of December 31, 2019, under the 2019 ESPP, were issued. Accordingly, during the first quarter of 2020, approximately $2,000 of employee payroll deductions accumulated at December 31, 2019, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $7,000 was returned to the employees. As of December 31, 2020, approximately $32,000 of employee payroll deductions have accumulated and have been recorded in accrued expenses. In January 2021, 54,447 shares that were purchased as of December 31, 2020, under the 2020 ESPP, were issued. Accordingly, during the first quarter of 2021, approximately $28,000 of employee payroll deductions accumulated at December 31, 2020, related to acquiring such shares, was transferred from accrued expenses to additional paid in capital. The remaining $4,000 was returned to the employees.

Commitments

Research and Development Contracts

We have entered into contracts with various contract research organizations with outstanding commitments aggregating approximately $30.0 million at March 31, 2021 for future work to be performed.

Operating leases

As of March 31, 2021, future minimum lease payments are as follows (in thousands):

Year Ending December 31,		
2021	$	350
2022		186
2023		158
2024		145
2025		149
		988
Included interest		(25)
	$	963

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.

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. In addition, for awards that vest immediately and are nonforfeitable, the measurement date is the date the award is issued.

Accounting for sale of Class B Units in November 2019 and February 2020 including beneficial conversion feature. In connection with the November 2019 and February 2020 underwritten offerings, we issued warrants to purchase our common stock and convertible preferred stock. To account for the transaction, we calculated the relative fair value of each instrument issued in the financing. We also determined if a beneficial conversion feature existed. A beneficial conversion feature is defined as a nondetachable conversion feature that is in the money at the commitment date. A conversion feature is in the money if its conversion price is less than the current fair value of the share. For purposes of measuring a beneficial conversion feature, the effective conversion price should be based on the proceeds allocated to the convertible instrument.

We determined the fair value of the warrants to purchase common stock, using a Monte Carlo simulation, for the November 2019 financing, which is a statistical method used to generate a defined number of share price paths to develop a reasonable estimate of the range of future expected share prices. We determined the fair value of the warrants, using the black-scholes method, for the February 2020 warrants. Estimates and assumptions impacting the fair value measurement include the number of shares for which the warrants are exercisable, remaining contractual term of the warrants, risk-free interest rate, expected dividend yield and expected volatility of the price of the underlying common shares. We estimate expected share volatility based on our historical volatility for a term equal to the contractual term of the warrants adjusted for a discount that a market participant would have taken when pricing the instrument. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve for time periods approximately equal to the remaining contractual term of the warrants. We estimated a 0% expected dividend yield based on the fact that we have never paid or declared dividends and do not intend to do so in the foreseeable future. In general, the assumptions used in calculating the fair value of the warrant represent management's best estimates, but the estimates involve inherent uncertainties and the application of management judgment. We determine the fair value of the convertible preferred stock utilizing the price of the common stock on the commitment date. We then allocated the relative fair value between the preferred shares and the warrants. Since the effective conversion price of the Preferred Stock is less than the fair value of the underlying common stock at the date of commitment, there is a beneficial conversion feature at the commitment date. Since the Preferred Stock has no stated maturity or redemption date and is immediately convertible at the option of the holder, the discount created by the beneficial conversion feature was charged to additional paid in capital as a "deemed dividend" and impacted earnings per share, reflected as an increase to loss to common stockholders.

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 March 31, 2021, 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 March 31, 2021 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II - OTHER INFORMATION

Item 1. Legal Proceedings

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

Item 1A. Risk Factors

Except as set forth below, there were no material changes from the risk factors set forth under Part I, Item 1A., "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020. You should carefully consider the risk factors set forth in our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, as well as other reports and statements that we file and have filed with the SEC, in addition to the other information set forth in this report which could materially affect our business, financial condition or future results. The risks and uncertainties described in this report and in our Annual Report on Form 10-K for the year ended December 31, 2020, as well as other reports and statements that we file with the SEC, are not the only risks and uncertainties facing us. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial may also have a material adverse effect on our financial position, results of operations or cash flows.

The market price of our common stock has been extremely volatile and may continue to be volatile due to numerous circumstances beyond our control.

The market price of our common stock has fluctuated, and may continue to fluctuate, widely, due to many factors, some of which may be beyond our control. These factors include, without limitation:

- "short squeezes";
- comments by securities analysts or other third parties, including blogs, articles, message boards and social and other media;
- large stockholders exiting their position in our common stock or an increase or decrease in the short interest in our common stock;
- actual or anticipated fluctuations in our financial and operating results;
- risks and uncertainties associated with the ongoing COVID-19 pandemic;
- the timing and allocations of new product candidates;
- public perception of our product candidates and competitive products; and
- overall general market fluctuations.

Stock markets in general and our stock price in particular have experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of those companies and our company. For example, on February 1, 2021 and February 11, 2021, the closing price of our common stock on The NASDAQ Global Market was $0.97 and $2.00, respectively, and daily trading volume on these days was approximately 20.2 million and 128.0 million shares, respectively. During this time, we made announcements regarding the addition of product candidates to our pipeline, and completed a $70.0 million public offering of our common stock at $1.20 per share. These broad market fluctuations may adversely affect the trading price of our common stock. In particular, a proportion of our common stock has been and may continue to be traded by short sellers which may put pressure on the supply and demand for our common stock, further influencing volatility in its market price. Additionally, these and other external factors have caused and may continue to cause the market price and demand for our common stock to fluctuate, which may limit or prevent investors from readily selling their shares of common stock and may otherwise negatively affect the liquidity of our common stock.

A "short squeeze" due to a sudden increase in demand for shares of our common stock that largely could lead to extreme price volatility in shares of our common stock.

Investors may purchase shares of our common stock to hedge existing exposure or to speculate on the price of our common stock. Speculation on the price of our common stock may involve long and short exposures. To the extent aggregate short exposure exceeds the number of shares of our common stock available for purchase on the open market, investors with short exposure may have to pay a premium to repurchase shares of our common stock for delivery to lenders of our common stock. Those repurchases may in turn, dramatically increase the price of our common stock until additional shares of our common stock are available for trading or borrowing. This is often referred to as a "short squeeze." A proportion of our common stock has been and may continue to be traded by short sellers which may increase the likelihood that our common stock will be the target of a short squeeze. A short squeeze could lead to volatile price movements in shares of our common stock that are unrelated or disproportionate to our operating performance or prospectus and, once investors purchase the shares of our common stock necessary to cover their short positions, the price of our common stock may rapidly decline. Investors that purchase shares of our common stock during a short squeeze may lose a significant portion of their investment.

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

10.01	License Agreement, dated April 14, 2021, between the Company and OyaGen, Inc. †
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 DEF	XBRL Taxonomy Extension Definition Linkbase Document
101 LAB	XBRL Taxonomy Labels Linkbase Document
101 PRE	XBRL Taxonomy Presentation 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: May 10, 2021

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

Date: May 10, 2021

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

Exhibit 10.1

EXECUTION DRAFT

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 "[***]."

LICENSE AGREEMENT

by and between

OYAGEN, INC.

and

TONIX PHARMACEUTICALS, INC.

April 14, 2021

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LICENSE AGREEMENT

This License Agreement (***"Agreement"***), effective as of April 14, 2021 (the ***"Effective Date"***), is made by and between **OYAGEN, INC**, a corporation organized and existing under the laws of the state of Delaware (***"OyaGen"***), and **TONIX PHARMACEUTICALS, INC.**, a corporation organized and existing under the laws of the State of Delaware (***"Tonix"***).

Recitals

Whereas, OyaGen owns, controls or has exclusive rights to certain assets, rights, intellectual property and know-how relating to the small molecule Compounds called Oya1 and Oya2, (as defined below);

Whereas, Tonix has experience in developing prescription pharmaceutical products;

Whereas, Tonix desires to obtain, and OyaGen is willing to grant to Tonix, an exclusive license under the OyaGen Technology to discover, develop, make, have made, use, sell, have sold, offer for sale, market, export, import and otherwise commercialize Products that contain Oya1 and/or Oya2 in the Field in the Territory, on the terms and subject to the conditions set forth herein.

Now, Therefore, in consideration of the foregoing premises and the mutual covenants contained herein, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby agree as follows:

ARTICLE 1

DEFINITIONS

Unless specifically set forth to the contrary herein, the following terms shall have the respective meanings set forth below:

1.1 "Accounting Standards" shall mean (a) U.S. generally accepted accounting principles, commonly known as *GAAP*, or (b) international financial reporting standards; in either case, consistently applied throughout the organization of a Party (or a Related Party, as applicable).

1.2 "Act" shall mean, as applicable, the United States Federal Food, Drug and Cosmetic Act, 21 U.S.C. §§301 et seq., and/or the Public Health Service Act, 42 U.S.C. §§262 et seq., as such may be amended from time to time.

1.3 "Affiliate" shall mean, with respect to any Person, any other Person that directly or indirectly controls, is controlled by or is under common control with such Person. A Person shall be deemed to control another Person if such Person possesses the power to direct or cause the direction of the management, business and policies of such Person, whether through the ownership of fifty percent (50%) or more of the voting securities of such Person, by contract or otherwise.

1.4 **"Agreement"** shall mean this License Agreement, including all Schedules and Exhibits hereto, as it may be amended, supplemented or modified from time to time in accordance with its terms.

1.5 **"Applicable Laws"** shall mean the applicable laws and regulations of any jurisdiction, which are applicable to any of the Parties or their respective Affiliates in carrying out activities hereunder or to which any of the Parties or their respective Affiliates in carrying out the activities hereunder is subject, and shall include all statutes, enactments, acts of legislature, laws, ordinances, rules, regulations, notifications, guidelines, policies, directions, directives and orders of any statutory authority, tribunal, board, or court or any central or state government or local authority or other governmental entity in such jurisdictions, including, without limitation, GCP, GLP and/or GMP.

1.6 **"Bankruptcy Laws"** shall have the meaning provided in Section 12.1.

1.7 **"Claim"** shall have the meaning provided in Section 10.1.

1.8 **"Combination Product"** shall mean a Product which includes one or more Other Actives in combination with a Compound. All references to Product in this Agreement shall be deemed to include Combination Product.

1.9 **"Commercially Reasonable Efforts"** shall mean, with respect to the efforts to be expended by a Party with respect to any objective, the level of reasonable, diligent, good faith efforts that biopharmaceutical 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, in each case, as reasonably determined by such Party in good faith. As used in this Section 1.9 "biopharmaceutical companies" shall mean companies in the biopharmaceutical industry of a size and stage of development similar to that of such Party, including having human pharmaceutical product candidates or products in a similar stage of development to the Products. Commercially Reasonable Efforts shall 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.

1.10 **"Competitive Infringement"** shall have the meaning provided in Section 8.3.

1.11 "Compound" shall mean Oya1 and/or Oya2 and (a) any derivatives, homologs, analogs, metabolites, prodrugs, conjugates, complexes, salts, free acids, bases, solvates, enantiomers, isomers, hydrates, esters, racemates or polymorphs of either or both Oya1 and Oya2 and/or any formulations thereof, in each case, existing as of the Effective Date or developed at any point during the Term and (b) all Derivatives of any of the foregoing existing as of the Effective Date or developed at any point during the Term. For the avoidance of doubt, OyaGen compounds (other than the Compounds), methods, leads and/or know how relating to any other treatment and cure for HIV/AIDS and/or cancer are not Oyagen Technology or Compounds under this Agreement.

1.12 "Confidential Information" shall mean any and all Information, whether communicated in writing or orally or by any other method, which is provided by or on behalf of one Party to the other Party prior to, on or after the Effective Date in connection with this Agreement or pursuant to that certain *Confidential Disclosure Agreement* between OyaGen and Tonix, dated as of March 7, 2020.

1.13 "Control", **"Controls"** or **"Controlled by"** shall mean, with respect to any Patent Rights, Information, Know-How or other intellectual property rights, the possession by Person of the ability (whether by ownership, license or other right, *other than* pursuant to a license granted under this Agreement) to grant access to, or a license or sublicense of, such Patent Rights, Know-How, Information or other intellectual property rights without violating the terms of any agreement or other arrangement with any other Person.

1.14 "Cover" means (a) with respect to Know-How, such Know-How was used in making, having made, using, selling, offering to sell, importing, having sold, exporting or making improvements to the Product, and (b) with respect to Patent Rights, a Valid Patent Claim (a patent claim, or a patent application claim if issued) would (absent a license thereunder or ownership thereof) be Infringed by making, having made, using, selling, offering to sell, importing, having sold or exporting the Product including research and development. Cognates of the word "**Cover**" shall have correlative meanings.

1.15 "Data Room Documents" means the materials listed on Schedule 1.15 as included in the electronic documentation site established by OyaGen on Box.com.

1.16 "Derivative" means a compound that is derived from the scaffold of the Compound using chemical reactions on the Compound or using de nova whole or partial molecule chemical synthesis.

1.17 "Developmental Milestone" shall have the meaning provided in Section 4.2(a).

1.18 "Dispute" shall have the meaning provided in Section 11.1.

1.19 **"Effective Date"** shall have the meaning provided in the Preamble.

1.20 **"EMA"** shall mean the European Medicines Agency or any successor entity thereto.

1.21 **"Export Control Laws"** shall mean all applicable U.S. laws and regulations relating to (a) sanctions and embargoes imposed by the Office of Foreign Assets Control of the U.S. Department of Treasury or (b) the export or re-export of commodities, technologies, or services, including the Export Administration Act of 1979, 24 U.S.C. §§2401-2420, the International Emergency Economic Powers Act, 50 U.S.C. §§1701-1706, the Trading with the Enemy Act, 50 U.S.C. §§1 et. seq., the Arms Export Control Act, 22 U.S.C. §§2778 and 2779, and the International Boycott Provisions of Section 999 of the U.S. Internal Revenue Code of 1986 (as amended).

1.22 **"FCPA"** shall mean the U.S. Foreign Corrupt Practices Act (15 U.S.C. §§78dd-1, et. seq.) as amended.

1.23 **"FDA"** shall mean the U.S. Food and Drug Administration and any successor entity thereto.

1.24 **"Field"** shall mean any and all preventative, therapeutic and prophylactic uses in humans and/or animals.

1.25 **"First Commercial Sale"** shall mean, with respect to a given Product that is at the time Covered by a Valid Patent Claim and/or that has Regulatory Exclusivity in a given country, the first commercial transfer or disposition for value of such Product by Tonix (or a Related Party) to a Third Party (other than a Related Party) for end use by a patient in such country after receipt of Marketing Approval for such Product in such country, excluding, however, transfers or dispositions of Product without consideration: (i) in connection with patient assistance programs; (ii) for charitable or promotional purposes; (iii) for preclinical, clinical, regulatory or governmental purposes or under so-called "named patient" or other limited access programs; or (iv) for use in any tests or studies reasonably necessary to comply with Applicable Law, regulation or request by a Regulatory Authority. For clarity, First Commercial Sale shall be determined on a Product-by-Product and country-by-country basis.

1.26 **"GCP"** shall mean the then current "good clinical practices" as such term is defined from time to time by the FDA, EMA or other Regulatory Authority of competent jurisdiction pursuant to its regulations, guidelines or otherwise, as applicable.

1.27 **"GLP"** shall mean the then current "good laboratory practices" as such term is defined from time to time by the FDA, EMA or other Regulatory Authority of competent jurisdiction pursuant to its regulations, guidelines or otherwise, as applicable.

1.28 **"GMP"** shall mean the then current "good manufacturing practices" as such term is defined from time to time by the FDA, EMA or other Regulatory Authority of competent jurisdiction pursuant to its regulations, guidelines or otherwise, as applicable.

1.29 **"IND"** shall mean an investigational new drug application, clinical study application, clinical trial exemption, or similar application or submission for approval to conduct human clinical investigations filed with or submitted to a Regulatory Authority in conformance with the requirements of such Regulatory Authority, including any such application filed with the FDA pursuant to 21 CFR Part 312.

1.30 **"Indemnified Party"** shall have the meaning provided in Section 10.3.

1.31 **"Indemnifying Party"** shall have the meaning provided in Section 10.3

1.32 **"Indication"** shall mean a separate and distinct disease or medical condition in humans: (a) which a Product is intended to treat or prevent, as evidenced by the protocol for a clinical trial of such Product or by the proposed Product labeling in an NDA filed with a Regulatory Authority for such Product; or (b) which is contained in a Product's labeling approved by a Regulatory Authority as part of the Marketing Approval for such Product.

1.33 **"Information"** shall mean any and all proprietary data, information, materials and know-how (whether patentable or not) that are not in the public domain, including: (a) ideas, discoveries, inventions, improvements, technology or trade secrets; (b) pharmaceutical, chemical and biological materials, products, components or compositions; (c) methods, procedures, formulas, processes, tests, assays, techniques, regulatory requirements and strategies; (d) biological, chemical, pharmacological, toxicological, pharmaceutical, physical and analytical, clinical, safety, manufacturing and quality control data and information related thereto; (e) technical and non-technical data and other information related to the foregoing; (f) drawings, plans, designs, diagrams, sketches, specifications or other documents containing or relating to such information or materials; and (g) business information, development plans, records and/or other information shared under or that is related to this Agreement or Party's exercise of its right hereunder. For clarification, "Information" also includes (i) any communication or reports (including without limitation, royalty, development and/or progress reports) related to the subject matter of this Agreement which by its nature is reasonably understood to be confidential and/or proprietary in nature, and (ii) all information obtained by OyaGen and/or its representatives at board meetings through the exercise of its observer rights.

1.34 **"Infringe"** or **"Infringement"** means any infringement as determined by Applicable Law, including, without limitation, direct infringement, contributory infringement or any inducement to infringe.

1.35 **"Initiates"** or **"Initiation"** shall mean, with respect to a human clinical trial, the administration of the first dose to the first patient/subject in such trial.

1.36 **"Invention"** shall mean each discovery, development, concept, idea, method, design, improvement, invention, formula, process, technique, program and all know-how and data datum, whether or not patentable, made or developed during the Term that is related to any Product or any Compound in the Field in the Territory, including, without limitation, any new Patent Rights that Cover the Compound and/or the use, composition, manufacture and/or administration of any Compound in the Field in the Territory.

1.37 **"Joint Invention"** shall have the meaning provided in Section 8.1.

1.38 **"Joint Patent Rights"** shall have the meaning provided in Section 8.1.

1.39 **"Know-How"** shall mean all know-how, show-how, technical and non-technical information, trade secrets, formulae, techniques, sketches, drawings, materials, models, inventions, designs, specifications, processes, apparatus, equipment, databases, research, experimental work, development, pharmacology and clinical data, software programs and applications, software source documents, third-party licenses, and any related type of proprietary intellectual property right other than Patent Rights.

1.40 **"Losses"** shall have the meaning provided in Section 10.1.

1.41 **"Marketing Approval"** shall mean all approvals from the relevant Regulatory Authority in a given country necessary to market and sell a pharmaceutical product in such country, including pricing and reimbursement approvals if required for marketing or sale of such product in such country.

1.42 **"NDA"** shall mean: (a) in the United States, a New Drug Application (as more fully defined in 21 CFR 314.5, *et seq*.) filed with the FDA, or any successor application thereto; or (b) in any other country or group of countries, the equivalent application or submission for approval to market a pharmaceutical product filed with the governing Regulatory Authority in such country.

1.43 **"Net Sales"** shall mean the gross amounts invoiced for sales or other dispositions of Products in the Territory by or on behalf of Tonix or any Related Party (each, a ***"Selling Party"***) to Third Parties (other than a Related Party), subject to the terms and conditions set forth in this Section 1.43, and less the following deductions actually incurred, allowed, paid, accrued or otherwise specifically allocated to Products by the Selling Party, all in compliance with applicable Accounting Standards, consistently applied by the Selling Party:

(a) trade discounts, including trade, cash and quantity discounts or rebates credits or refunds, actually allowed or taken;

(b) credits or allowances granted or made for rejection of or return of previously sold Products, including recalls, or for retroactive price reductions and billing errors or for stocking allowances;

(c) governmental and other rebates (or credits or other equivalents thereof) actually granted to managed health care organizations, commercial insurance companies, pharmacy benefit managers (or equivalents thereof), distributors, national, state/provincial, local, and other governments, their agencies and purchasers, and reimbursers, or to trade customers;

(d) fees paid to wholesalers, distributors, selling agents (excluding sales representatives of the Selling Party), group purchasing organizations, Third Party payors, other contractees and managed care entities, in each case with respect to the Product;

(e) charges for freight, insurance, transportation, postage and handling;

(f) taxes, custom duties or other governmental charges (including any tax, such as a value added or similar tax or government charge, but excluding what is commonly known as income tax) levied on or measured by the billing amount for Products, as adjusted for rebates and refunds; and

(g) bad debts or provision for bad debts deductions actually written off during the applicable accounting period following the applicable Accounting Standards used by the Selling Party.

In no event shall any particular amount identified above be deducted more than once in calculating Net Sales (*i.e.*, no "double counting" of deductions).

On a country-by-country basis, if a Product under this Agreement is sold in the form of a Combination Product in a country, Net Sales for the purpose of determining royalties due hereunder shall be calculated as follows:

(i) Where all active ingredients in such Combination Product are sold separately in such country, Net Sales shall be calculated by multiplying actual Net Sales of such Combination Product in such Country as determined under the first paragraph of this Section 1.43 by the fraction A/(A+B), where A is the net invoice price of the Product as sold separately in such country, and B is the sum of the net invoice prices of the Other Active(s) in the combination.

(ii) If the Product component of the Combination Product is sold separately in such country, but none of such Other Active(s) is sold separately in such country, Net Sales shall be calculated by multiplying actual Net Sales of such Combination Product in such country as determined under the first paragraph of this Section 1.43 by the fraction A/C, where A is the net invoice price of such Product component as sold separately in such country, and C is the net invoice price of the Combination Product in such country.

(iii) If the Product component of the Combination Product is not sold separately in such country, but the Other Active(s) are sold separately in such country, Net Sales shall be calculated by multiplying actual Net Sales of such Combination Product in such country as determined under the first paragraph of this Section 1.43 by the fraction (C-D)/C, where C is the net invoice price of the Combination Product in such country, and D is the sum of the net invoice prices charged for the Other Active(s) in the Combination Product in such country.

(iv) If none of the Product component and the Other Active(s) are sold separately in such country, Net Sales for the purpose of determining royalties due hereunder for the Combination Product shall be determined by mutual agreement of the Parties in good faith taking into account the perceived relative value contributions of the Product portion of the Combination Product and the Other Active(s) in the Combination Product. In case of disagreement, an independent expert agreed upon by both Parties or, failing such agreement, designated by the International Chamber of Commerce, shall determine such relative value contributions and such determination shall be final and binding upon the Parties.

In the event Product is "bundled" for sale together with one or more other products in a country (a **"Product Bundle"**), then Net Sales for such Product sold under such arrangement shall be determined on a country-by-country basis by mutual agreement of the Parties in good faith taking into account the relative value contributions of the Product and the other products in the Product Bundle, as reflected in their individual sales prices. In case of disagreement, an independent expert agreed upon by both Parties or, failing such agreement, the a mutually acceptable panel of experts (with each party choosing one expert, and those two experts choosing a third) shall determine such relative value contributions and such determination shall be final and binding upon the Parties. In addition, if a Selling Party provides discounts or allowances with respect to a Product Bundle, such discounts and allowances shall be allocated (for purposes of the deductions used in calculating Net Sales as above) between the Product and the other products in the Product Bundle in a manner that does not unfairly or inappropriately bias the level of discounting against the Product as compared to the other products in such Product Bundle.

For clarification, sale of Product by a Selling Party to another Selling Party for resale by such entity to a Third Party (other than a Related Party) shall not be deemed a sale for purposes of this definition of "Net Sales," provided that the subsequent resale is included in the computation of Net Sales. For instance, if Tonix sells Product to a distributor, the sale to the distributor will be the sale included in Net Sales. But in the event that Tonix sells Product to a Sublicensee which then sells Product to a distributor for resale, the Sublicensee's sale to the distributor will be included in Net Sales. Further, transfers or dispositions of Product without consideration: (A) in connection with patient assistance programs; (B) for charitable or promotional purposes; (C) for preclinical, clinical, regulatory or governmental purposes or under so-called "named patient" or other limited access programs; or (D) for use in any tests or studies reasonably necessary to comply with Applicable Law, regulation or request by a Regulatory Authority, shall not, in each case of (A) through (D), be deemed sales of such Product for purposes of this definition of "Net Sales."

1.44 **"Other Active"** shall mean any active pharmaceutical ingredient that is not a Compound.

1.45 "**Oya1**" means sangivamycin free base.

1.46 "**Oya2**" means sangivamycin hydrochloride.

1.47 **"OyaGen"** shall have the meaning provided in the Preamble.

1.48 **"OyaGen [***] Patent Rights"** shall mean any OyaGen Patent Rights, existing as of the Effective Date or at any point during the Term, that relate to or that Cover, in whole or part, the administration or use of any Compound or Product as an antiviral agent against a virus in the [***] family, including, without limitation, the OyaGen Patent Rights included in **Part 3** of **Exhibit A**, and/or any OyaGen Patent Rights that claim right of priority from or benefit to any of the patent applications listed in **Part 3** of **Exhibit A**.

1.49 **"OyaGen [***] Patent Rights"** shall mean any OyaGen Patent Rights, existing as of the Effective Date or at any point during the Term, that relate to or that Cover, in whole or part, the administration or use of any Compound or Product as an antiviral agent against a virus in the [***] family, including, without limitation, the OyaGen Patent Rights included in **Part 2** of **Exhibit A**, and/or any OyaGen Patent Rights that claim right of priority from or benefit to any of the patent applications listed in **Part 2** of **Exhibit A**.

1.50 **"OyaGen [***] Patent Rights"** shall mean any OyaGen Patent Rights, existing as of the Effective Date or at any point during the Term, that relate to or that Cover, in whole or part, the administration or use of any Compound or Product as an antiviral agent against the [***] virus, including, without limitation, the OyaGen Patent Rights included in **Part 1** of **Exhibit A**, and/or any OyaGen Patent Rights that claim right of priority from or benefit to any of the patent applications listed in **Part 1** of **Exhibit A**. The OyaGen [***] Patent Rights are jointly owned by OyaGen and The United States of America as represented by The Secretary of Health and Human Services.

1.51 **"OyaGen Indemnitee"** means each of OyaGen, its Affiliates, its and their respective officers, directors, agents, employees, successors and assigns.

1.52 **"OyaGen Information"** shall mean the data and other Information related to the Compounds that has been or that could reasonably be expected to be used for the development of the Compounds, and/or that has been or will be publicly disclosed in the process of registration of the Products in the Territory, that is owned by OyaGen or otherwise in the possession of, developed by or on behalf of, or otherwise Controlled by OyaGen or any of its Affiliates as of the Effective Date, in each case, that is necessary or useful for development by Tonix or any of its Related Parties of any Compound or commercialization of any Product or that otherwise relates, in whole or in part, to the manufacture, development, composition, use, administration or formulation of any Compound and/or any Product, including, without limitation, all clinical data, adverse event data, pharmaceutical development reports, and other medical information.

1.53 "OyaGen Know-How" shall mean all Know-How Controlled by OyaGen or any of its Affiliates as of the Effective Date or at any point during the Term, in each case, that is specific for the Compounds and Products in the Field and/or that is necessary or useful for development by Tonix of any Compound or commercialization of any Product or that otherwise relates, in whole or in part, to Tonix's manufacture, development, composition, use, administration or formulation of any Compound and/or any Product, including, without limitation, all clinical data, adverse event data, pharmaceutical development reports, and other medical information, including, without limitation, the OyaGen Information. For clarification "OyaGen Know-How" includes the data, methods, reagents, clones, cell lines, Compound-related chemophores, patents, progress reports from the National Institute of Allergy and Infectious Diseases (**"NIAID"**) and other documentation of OyaGen research and drug discovery and/or development programs for use in prevention, as a therapeutic, as a prophylactic and/or as a research tool to the extent that they specifically pertain to the Compounds and their current and future viral disease applications, as well as all viral preventative, therapeutic and prophylactic indications where Oya1 and Oya2 or Compound-related chemophores that have demonstrable antiviral activity as of the Effective Date or at any point during the Term. For further clarification "OyaGen Know-How" does not include (a) the data, methods, reagents, clones, cell lines, hit and lead chemistries in OyaGen's strategic plan, pipeline or are, will or may be developed by OyaGen for hit and lead chemistries on viral diseases outside of the scope viruses delineated in OyaGen's patent applications, or (b) drug discovery for other disease indications such as ageing, cancer immunologic, metabolic, neurologic or reproductive as these are within the scope of OyaGen's ongoing business operations (which include but are not limited to partnering with other technology leaders and/or entities to develop novel antiviral drug leads stemming from internal ideations, development of methodologies and discoveries as part of preclinical development and vetting), in each case of (a) – (b) that (i) are identified after the Effective Date and (ii) that are not Inventions or otherwise specific to any Compound or any Product.

1.54 "OyaGen Patent Rights" means any Patent Rights in the Territory that are Controlled by OyaGen or any of its Affiliates that relate to or that Cover, in whole or part, the composition of matter, manufacture, composition, administration or use of the Compounds and/or the Products, in each case, existing as of the Effective Date or at any point during the Term. OyaGen Patent Rights include, but are not limited to, the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights existing as of the Effective Date or at any point during the Term, and any other Patent Rights listed in **Exhibit A**.

1.55 **"OyaGen Technology"** shall mean (a) the OyaGen Patent Rights, (b) the OyaGen Know-How, (c) any Invention Controlled by OyaGen at any time during the Term, and (d) OyaGen's interest in any Joint Inventions and Joint Patent Rights.

1.56 **"OyaGen [***] Patent Rights"** shall mean any OyaGen Patent Rights, existing as of the Effective Date or at any point during the Term, that relate to or that Cover, in whole or part, the administration or use of any Compound or Product as an antiviral agent against a virus in the [***] family, including, without limitation, the OyaGen Patent Rights included in **Part 4** of **Exhibit A**, and/or any OyaGen Patent Rights that claim right of priority from or benefit to any of the patent applications listed in **Part 4** of **Exhibit A**.

1.57 **"OyaGen's knowledge"** means the actual knowledge, as of the Effective Date, of Dr. Harold C. Smith, CEO of OyaGen, after due inquiry.

1.58 **"Party"** shall mean Tonix and OyaGen, individually, and "**Parties**" shall mean Tonix and OyaGen, collectively.

1.59 **"Patent Certification"** shall have the meaning provided in Section 8.3.

1.60 **"Patent Rights"** shall mean (i) patents and patent applications (which for the purposes of this Agreement shall be deemed to include certificates of invention and applications for certificates of invention); (ii) any substitutions, extensions, additions, reissues, reexaminations, renewals, divisions, continuations, continuations-in-part or supplementary protection certificates thereof; and (iii) any and all foreign equivalents or counterparts of the foregoing.

1.61 **"Person"** means any individual, partnership, joint venture, limited liability company, corporation, firm, trust, association, unincorporated organization, governmental authority or agency, or any other entity not specifically listed herein.

1.62 **"Phase 2 Clinical Trial"** shall mean a human clinical trial of Product, the principal purpose of which is a determination of safety and an assessment of its efficacy in the target patient population, as described in 21 C.F.R. 312.21(b) (as amended or replaced), or a similar clinical study prescribed by a Regulatory Authority in a country.

1.63 **"Product"** shall mean any and all pharmaceutical compositions or preparations (in any and all dosage forms) in final form containing a Compound as an active ingredient alone or in a Combination Product for use in the Field in the Territory.

1.64 "**Region**" shall mean each of (i) United States, (ii) at least one country in the European Union, (iii) United Kingdom, (iv) China and/or (v) Japan.

1.65 **"Regulatory Authority"** shall mean any country, federal, regional, supranational, state or local regulatory agency, department, bureau or other governmental or regulatory authority having the administrative authority to regulate the development or marketing of pharmaceutical products in any country or jurisdiction.

1.66 **"Regulatory Documentation"** shall mean all regulatory applications, registrations, licenses, authorizations and approvals (including all INDs, NDAs and Marketing Approvals), 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 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 INDs, NDAs, advertising and promotion documents, manufacturing data, drug master files, clinical data, adverse event files and complaint files, in each case related to a Compound or a Product.

1.67 **"Regulatory Exclusivity"** shall mean marketing or manufacturing exclusivity conferred by the applicable Regulatory Authority in a country on the holder of a Marketing Approval for a pharmaceutical product in such country, including, by way of example and not of limitation, regulatory data exclusivity, orphan drug exclusivity, new chemical entity exclusivity and pediatric exclusivity.

1.68 **"Related Party"** shall mean each of Tonix's Sublicensees, Tonix's Affiliates, and its and their respective Sublicensees hereunder.

1.69 **"Relevant Patent Rights"** shall have the meaning provided in Section 8.3(a).

1.70 "**Reversion**" shall have the meaning set forth in Section 3.2.

1.71 **"Royalty Term"** shall have the meaning provided in Section 4.5.

1.72 "**Samples**" has the meaning given to such term in Section 2.4.

1.73 **"Secondary Indication"** means any use of the Compounds or Products in the Field for viral treatments in humans other than the first Indication.

1.74 **"Sublicensee"** shall mean a Third Party sublicensee under the license granted by OyaGen to Tonix pursuant to Section 2.1, whether such Third Party's sublicense was granted to it directly by Tonix or its Affiliate or indirectly through one or more tiers of sublicense.

1.75 **"Term"** shall have the meaning provided in Section 9.1.

1.76 **"Term Sheet"** means that certain *Non-Binding Term Sheet*, dated as of March 19, 2020 by and between the Parties.

1.77 **"Territory"** shall mean the entire world.

1.78 **"Third Party"** shall mean an entity other than Tonix and its Affiliates, and OyaGen and its Affiliates.

1.79 **"Tonix"** shall have the meaning provided in the Preamble.

1.80 "**Tonix Common Stock**" shall mean the common stock of the Parent.

1.81 **"Tonix Common Stock Five Day VWAP"** means, for Tonix Common Stock as of any date, the volume weighted average price per share of Tonix Common Stock as reported on the Nasdaq Global Market during the five (5) trading days subsequent to OyaGen's election to receive Tonix Common Stock under Section 4.2(a)(ii).

1.82 **"Tonix Indemnitee"** means each of Tonix, its Affiliates, and its and their respective officers, directors, agents, employees, successors, Sublicensees and assigns.

1.83 **"Tonix Patent Rights"** shall mean all Patent Rights Controlled by Tonix or its Affiliates during the Term that claim or cover the composition of matter, manufacture or use of any Compound and/or Product, but specifically excluding the OyaGen Patent Rights.

1.84 **"Transaction"** shall have the meaning provided in Section 2.4.

1.85 **"Valid Patent Claim"** shall mean (a) a claim of any pending patent application or any issued and unexpired patent included within the OyaGen Patent Rights, which claim has not been revoked or held unenforceable or invalid by a decision of a court or other governmental agency of competent jurisdiction (which decision is not appealable or has not been appealed within the time allowed for appeal), or which claim has not been disclaimed, denied or admitted to be invalid or unenforceable through reissue, re-examination or disclaimer or otherwise; and (b) so long as there is Regulatory Exclusivity in the subject country and/or jurisdiction, a claim of a pending patent application included within the OyaGen Patent Rights, which claim has not been cancelled, disclaimed or abandoned, provided that if a claim of a pending patent application shall not have issued within seven (7) years after the earliest filing date from which such claim takes priority or benefit, such claim shall not constitute a Valid Patent Claim for the purposes of this Agreement unless and until a patent issues with such claim and the requirements of (a) are otherwise satisfied.

ARTICLE 2

LICENSE GRANT

2.1 **License Grant.** OyaGen hereby grants to Tonix an exclusive (even as to OyaGen and its Affiliates), sublicensable (including through multiple tiers), transferrable (without consent) royalty-bearing license under the OyaGen Technology to discover, develop, make, have made, import, export, use, offer for sale, have sold and sell and otherwise commercialize the Compounds and/or Products in the Field in the Territory.

2.2 Non-Compete. OyaGen hereby covenants not to practice, and not to permit or cause any of its Affiliates to develop, use, make, have made, sell, have sold, offer for sale**,** export, import or otherwise commercialize any compound or product that competes with a Compound or Product in the Field in the Territory during the Term. For clarification, subject to its obligations under Section 2.4, (i) this Section 2.2 does not prevent or restrict OyaGen from having possession of a Compound or for using a Compound as a control, except as may subsequently be agreed between the Parties in a signed writing and (ii) OyaGen shall be permitted to possess and use Compounds as controls in research activities unrelated to the use of a Compound or a Product in the Field in the Territory during the Term.

2.3 Technology Transfer.

(a) OyaGen Know-How. OyaGen represents and warrants that prior to the Effective Date, OyaGen has transferred and/or provided to Tonix copies of: (i) all preclinical, clinical and other data and documentation that is included and/or that pertains to the OyaGen Technology, including, without limitation, the OyaGen Information; (ii) all lab books and other research records, files, patent office correspondence and other documentation reasonably necessary for Tonix to assume responsibility and control over prosecution, maintenance, defense, and enforcement of OyaGen Patent Rights; and (iii) any and all other information and documentation reasonably necessary to successfully transition the licensed OyaGen Technology to Tonix or its designee, including, but not limited to patent prosecution histories, file wrappers and other information related to the maintenance of the OyaGen Patent Rights; in each case, to the extent in OyaGen's possession and Control or otherwise obtainable by OyaGen (whether generated by or on behalf of OyaGen) and to the extent such data exists in electronic form, OyaGen has provided the same to Tonix in electronic form.

(a) Post-Closing Obligations. In the event that after the Effective Date, either Party discovers that OyaGen has failed to transfer and/or deliver any OyaGen Know-How, Regulatory Documentation and/or other data or information required to be delivered to Tonix under the terms of this Agreement, OyaGen shall promptly deliver and/or transfer such OyaGen Know-How, Regulatory Documentation and/or other information to Tonix and/or its designee.

2.4 Right of First Negotiation. If at any time during the Term, OyaGen desires to sell, out license or otherwise transfer any Patent Rights or Know-How that OyaGen identifies after the Effective Date that (a) was reduced to practice, conceived or otherwise developed, in whole or in part, through use of a Compound (including, without limitation, as a positive control) or (b) relates to the prevention and/or treatment of Covid-19 and/or any other coronavirus or coronaviruses or other viruses in humans or animals, then in such instance, OyaGen shall provide Tonix with written notice of such intention, which notice will include a description of the subject technology and such other information as Tonix may reasonably request. Tonix will have thirty (30) days from the receipt of such written notice to review the opportunity and determine whether (a) to seek to negotiate to acquire and/or (b) to license and/or (c) to collaborate on such technology (each, a "**Transaction**"). If Tonix determines to seek to negotiate a Transaction, then the Parties shall exclusively negotiate in good faith for a period of sixty (60) days to reach agreement on Transaction terms. If the Parties are unable to reach agreement with respect to a Transaction then in such instance, OyaGen shall be free to negotiate an alternative transaction with a Third Party without any limitations whatsoever. For clarity, any Patent Rights or Know-How that are developed on or after the Effective Date that relate to the Compounds are "Inventions" that are automatically subject to the license grant in Section 2.1. Further, any Patent Rights or Know-How developed as a result of the work referenced on Schedule 7.2(q) will be subject to this Section 2.4.

2.5 Samples. At Tonix's request, OyaGen shall provide, or cause to be provided to Tonix or its designee, samples (up to the amount of its entire inventory) of each Compound in such amounts as reasonably requested by Tonix ("**Samples**"). Tonix will reimburse OyaGen for all expenses related to delivering such Samples to Tonix at cost. All Samples will be shipped to Tonix and/or its designee at Tonix's expense and in accordance with all applicable laws. All Samples shall be provided on an "as is, where is" basis, and without representations or warranties of any kind.

2.6 Post-Effective Date Commitments.

(a) OyaGen will, at Tonix's request, engage NIAID (at OyaGen's expense) in discussions with the intent to enter into an exclusive license of NIAID's and/or NIH's joint interest in the patent applications listed in **Part 1** of **Exhibit A** (i.e., the OyaGen [***] Patent Rights jointly owned by OyaGen and The United States of America as represented by The Secretary of Health and Human Services) to OyaGen (the **"NIAID License"**). Tonix agrees that an ***NIAID/NIH Interinstitutional Agreement —Institution Lead*** executed by NIAID/NIH and OyaGen (the "**Interinstitutional Agreement**") is an acceptable legal instrument to formalize the NIAID License. OyaGen will keep Tonix fully informed with respect to the status of its negotiations with NIAID and/or NIH. The final version of the Interinstitutional Agreement must be effective to enable OyaGen to exclusively sublicense NIAID's rights to the OyaGen [***] Patent Rights to Tonix. In the event that OyaGen or any of its Affiliates ultimately enters into the NIAID License, the licensed Patent Rights under such license will be considered OyaGen Patent Rights as OyaGen Technology and subject to the license grant in Section 2.1. Tonix shall not be responsible for the payment of any fees, royalties and/or other payments due to NIAID and/or NIH in connection with the NIAID License which shall be the sole responsibility of OyaGen.

(b) If during the course of the Term of this Agreement the US Government (by NIAID or NIH) is inserted as a joint owner of any of the OyaGen [***] Patent Rights, OyaGen [***] Patent Rights, and/or OyaGen [***] Patent Rights as set forth in **Exhibits A-2, A-3,** and **A-4**, respectively (collectively and separately the **"New Joint Patent Rights"**), OyaGen will engage NIAID (at OyaGen's expense) in discussions with the intent to enter into an exclusive license of NIAID's and/or NIH's joint interest in the New Joint Patent Rights to OyaGen (the **"Amended NIAID License"**). Tonix agrees that an ***amended*** or ***new*** Interinstitutional Agreement between NIAID/NIH and OyaGen to cover the New Joint Patent Rights is an acceptable legal instrument to formalize the Amended NIAID License (the "**Amended Interinstitutional Agreement")**. OyaGen will keep Tonix fully informed with respect to the status of its negotiations with NIAID and/or NIH. The final version of the Amended Interinstitutional Agreement must be effective to enable OyaGen to exclusively sublicense NIAID's rights to the New Joint Patent Rights to Tonix. In the event that OyaGen or any of its Affiliates ultimately enters into the Amended NIAID License, the licensed New Joint Patent Rights under such license will be considered OyaGen Patent Rights as OyaGen Technology and subject to the license grant in Section 2.1. Tonix shall not be responsible for the payment of any fees, royalties and/or other payments due to NIAID and/or NIH in connection with the Amended NIAID License which shall be the sole responsibility of OyaGen. Notwithstanding anything to the contrary in this Section 2.6(b) or anywhere else in this Agreement, in the event that NIAID and/or NIH has any right, title and/or interest in or to the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights and/or the OyaGen [***] Patent Rights, in addition to any other remedies that Tonix may have under this Agreement, at law or in equity, this Section 2.6(a) will apply to such Patent Rights as well.

(c) OyaGen will maintain the NIAID License and if applicable the Amended NIAID License in full force and effect from its effective date through the remainder of the Term. OyaGen will make all payments when due and perform its obligations under the NIAID License and if applicable the Amended NIAID License and will not fail to exercise its rights under the NIAID Licsne and if applicable the Amended NIAID License in any manner that could reasonably be considered to be detrimental to Tonix or any of its Related Parties. OyaGen will not amend the NIAID License or if applicable the Amended NIAID License without Tonix's written consent. OyaGen will use Commercially reasonable Efforts to ensure that the NIAID License and if applicable the Amended NIAID License provides that in the event that such licensed is terminated for breach by Oyagen or otherwise, then Tonix will be entitled to a direct license from NIAID.

ARTICLE 3

DEVELOPMENT, MANUFACTURING AND COMMERCIALIZATION

3.1 Responsibility. Tonix (itself and/or with or through a Related Party) shall be solely responsible, at its own expense, for, and shall control all aspects of, worldwide development (including, without limitation, pre-clinical and clinical development), manufacture, registration and commercialization (including, without limitation, marketing, promoting, selling, distributing and determining pricing for) Products in the Territory. Without limiting the generality of the foregoing, Tonix (itself and/or with or through a Related Party) shall be solely responsible for preparing and submitting all required regulatory filings in connection with obtaining and maintaining Marketing Approvals with respect to Products in the Field in the Territory, including all INDs and NDAs. All of such submissions and other regulatory filings relating to Products shall be submitted in the name of, and owned by, Tonix (or a Related Party, as applicable).

3.2 Diligence.

(a) Tonix shall use Commercially Reasonable Efforts to develop and commercialize the Products in at least one Region. In the event Tonix has not exercised Commercially Reasonable Efforts to commercialize a Product within thirty-six (36) months of the approval of such Product within the Region in which it is first approved and provided that the failure to commercialize is not the result of the failure of OyaGen to perform its obligations under the Agreement or a supply failure or other regulatory issues in such Region then marketing and manufacturing rights to the OyaGen Technology for such Region (and only such Region) shall revert to OyaGen.

(b) In the event of a reversion of rights as described in 3.2(a) above, Tonix shall be entitled to receive fifty percent (50%) of any consideration received by OyaGen or any of its Affiliates from any Third Party granted the right to commercialize the Product in such Region ("**Revenue Sharing**"); provided that, Revenue Sharing shall be calculated net of commercially reasonable and documented direct third party out-of-pocket costs incurred and actually paid by OyaGen related to the subject Third Party agreement ("**DOPC**"). The terms and conditions of Article 5 of this Agreement, including, without limitation, with respect to record maintenance, reporting, payment and audit rights, will be applicable to any and all Revenue Sharing payments made by OyaGen, mutatis mutandis.

3.3 Records. Tonix shall maintain, or cause to be maintained, records of all development work conducted by or on behalf of Tonix with respect to Products. All such records maintained shall be in sufficient detail and in good scientific manner appropriate for patent and regulatory purposes.

3.4 Reports. On or before June 30th and December 31st of each year during the Term beginning on December 31, 2021, Tonix shall deliver to OyaGen a written progress report regarding, to the extent applicable, (i) the status of any Product in development, (ii) any Product-related regulatory submissions and approvals, (iii) any Product-related commercialization efforts in the Territory and (iv) progress toward each of the Developmental Milestones (to the extent that any are outstanding).

3.5 Compliance with Applicable Laws. Tonix shall conduct, and shall cause each Related Party to conduct, all development, regulatory, manufacturing and commercialization activities with respect to Products anywhere in the world in compliance with all Applicable Laws.

ARTICLE 4

PAYMENTS

4.1 Upfront Payments.

(a) Equity Issuance. In consideration for the rights and licenses granted to Tonix hereunder, Tonix shall (i) issue to OyaGen, as soon as practicable following the Effective Date and in no event later than thirty (30) business days thereafter, such number of shares of common stock, $.001 par value, with a value of $[***] (the **"Tonix Common Stock - OyaGen"**) of Tonix Pharmaceuticals Holding Corp. (the "**Parent")** and (ii) issue to Procela Partners Ltd. ("**Procela**"), as soon as practicable following the Effective Date and in no event later than thirty (30) business days thereafter, such number of shares of common stock, $.001 par value, with a value of $150,000, (the **"Tonix Common Stock - Procela"**), and together with the Tonix Common Stock – OyaGen, the **"Upfront Tonix Common Stock")** of Parent, in each case, for all purposes the effective date of issuance (of record) with regard to Upfront Tonix Common Stock shall be the Effective Date. Notwithstanding anything contained herein to the contrary, the number of shares of Upfront Common Stock shall not exceed 5,000,000. The Upfront Tonix Common Stock will not be registered, and shall have no rights to registration, pursuant to the terms of the Securities Act of 1933, as amended, shall not be transferrable for a period of six (6) months and shall bear the restrictive legends in the form attached hereto as **Exhibit B.** The Upfront Tonix Common Stock shall be issued to OyaGen and to Procela pursuant to the terms of Subscription Agreements in Parent's customary form. Certain additional rights and obligations with respect to the Upfront Tonix Common Stock will be set forth in a Voting Agreement in the form attached hereto as **Exhibit C**).

(b) Upfront Payment. In consideration for the rights and licenses granted to Tonix hereunder, within two (2) business days following the Effective Date Tonix shall pay to OyaGen an amount equal to [***] dollars ($[***]) *minus* the amount of any payments made to OyaGen (and/or placed in escrow) in connection with the Term Sheet which contemplates up to [***] dollars ($[***]) in exclusivity payments. As of the Effective Date, OyaGen acknowledges and agrees that it has received $100,000 in exclusivity payments which shall be deducted from the Upfront Payment hereunder.

4.2 Milestone Payments.

(a) Milestone Events; Milestone Payments. Within sixty (60) days of the achievement of each of the milestone events set forth in the table below (each, a **"Milestone Event"**) by Tonix or a Related Party, Tonix shall provide OyaGen with written notice of such achievement (the date of issuance, being the **"Notice Date"**) and shall pay to OyaGen the corresponding milestone payments set forth below (each a **"Milestone Payment"**):

Milestone Events	Milestone Payments
(i) [***]	$[***]
(ii) [***]	$[***]
(iii) [***]	$[***]
(iv) [***]	$[***]per

(A) The Milestone Payments in Section 4.2(a)(i), (ii) and (iii) shall only be paid once, for the first achievement of the corresponding milestone event by any Product (regardless of the number of times such milestone event is achieved by a Product, the number of Indications for which such milestone event is achieved by a Product, or the number of Products that achieve such milestone event, and regardless of whether any such milestone event is achieved by the same Product that achieved any other milestone event or by a different Product). No Milestone Payments will payable for an approval of a Product for animal use.

(B) Each Milestone Payment will be payable, at OyaGen's option, in cash or in Tonix Common Stock. In the event that OyaGen elects to receive Tonix Common Stock, it will be subject to the terms of the Voting Agreement and will be issued pursuant to the terms of a Subscription Agreement in Parent's customary form. OyaGen's written election of such option must be received by Tonix within five (5) business days of the Notice Date, and, if a timely election not made the amount will be paid in cash. Tonix shall make cash payments hereunder within the period required under Section 4.2(a). In the event that the payment is to be made in Tonix Common Stock, it will be made at the Tonix Common Stock Five Day VWAP, as soon as practicable following date Tonix received OyaGen's written election and in no event later than the period contemplated by Section 4.2(a), in each case, for all purposes the effective date of issuance (of record) with regard to such Tonix Common Stock shall be no later than two (2) business days after the date Tonix received OyaGen's written election. The Tonix Common Stock will not be registered, and shall have no rights to registration, pursuant to the terms of the Securities Act of 1933, as amended, shall not be transferrable for a period of six (6) months and shall bear the restrictive legends in the form attached hereto as Exhibit B. The Tonix Common Stock shall be issued to OyaGen pursuant to the terms of Subscription Agreements in Parent's customary form. Certain additional rights and obligations with respect to the Tonix Common Stock will be set forth in a Voting Agreement in the form attached hereto as Exhibit C).

4.3 Royalties. Subject to Sections 4.5, 4.6 and 4.7 below, as partial consideration for the licenses granted under this Agreement, Tonix shall pay royalties to OyaGen on aggregate annual Net Sales during the Royalty Term at the applicable rate(s) set forth below:

Annual Net Sales Increments	Royalty Rate
That portion of annual Net Sales that is less than or equal to US$[***]	[***]%
That portion of annual Net Sales that is greater than US$100 million and less than or equal to US$[***]	[***]%
That portion of annual Net Sales that is greater than US$[***]	[***]%

4.4 Sublicense Fees. Tonix shall pay to OyaGen [***]percent ([***]%) of any non-sales based cash sublicense consideration paid to and actually received Tonix or any of its Affiliates, including licensing fees and development based milestones but excluding (i) any consideration based on account of royalties or milestones on Product sales, (ii) investments in Tonix equity, (iii) reimbursement of direct research and development expenses incurred and required to be incurred by Tonix or loans to Tonix as part of the sublicense (including, without limitation, payments for FTEs) except to the extent that such reimbursements or loans are forgiven, (iv) fees payable to Tonix for bona fide services that are delivered in connection with the subject sublicense, (v) bona fide security investments, debt or other types of investments in the Tonix, including the right to acquire Tonix securities in the future, such as warrants, convertible debt and the like and (vi) reimbursement of fees or expenses incurred in connection with prosecution, maintenance, defense and/or enforcement of intellectual property rights. Payments of sublicense consideration under this Section 4.4 shall be made within sixty (60) days of the receipt of such consideration by Tonix, and shall be accompanied by a description of the sublicense income giving rise to the payment obligation in reasonable detail.

4.5 Royalty Term. Royalties under Section 4.3 shall be payable during the period of time commencing on the date of First Commercial Sale and ending on a country-by-country basis with respect to each Product upon the later of: (a) expiration of the last-to-expire Valid Patent Claim of the OyaGen Patent Rights Covering the manufacture, use or sale of such Product or the Compound contained in such Product in such country and (b) the expiration of any Regulatory Exclusivity applicable to such Product in such country (the ***"Royalty Term"***). On a Product-by-Product and country-by-country basis, upon expiration of the Royalty Term for a Product in a country, Tonix's licenses under Section 2.1 with respect to such Product in such country shall become fully-paid, irrevocable and perpetual.

4.6 Third Party Licenses. In the event that Tonix determines that it is necessary to obtain one or more licenses to Patent Rights of Third Parties in order to make, have made, use, offer to sell, sell or import a Product in a country (**"Third Party Patent Licenses"**), fifty percent (50%) of the royalties actually paid to Third Parties under such Third Party Patent Licenses by Tonix for the sale of such Product in such country for a calendar quarter shall be creditable against the royalty payments due OyaGen by Tonix with respect to Net Sales of such Product in such country for such calendar quarter; provided, however, that in no event shall the royalties otherwise owed by Tonix to OyaGen for such calendar quarter in such country be reduced by more than fifty percent (50%) as a result of any and all such offsets in the aggregate and further provided that no such offset will be permitted to the extent that such offset reduces the royalty payable to OyaGen below the royalty payable to the subject third party.

4.7 Compulsory Licenses. If a compulsory license is granted to a Third Party with respect to Product in any country with a royalty rate lower than the royalty rate under Section 4.3, then the royalty rate applicable to Net Sales of such Product in that country under Section 4.3 shall be reduced to a rate which is two (2%) percentage points (i.e., 200 basis points) less than the rate paid by the compulsory licensee; provided, however, that if the royalty rate payable by the compulsory licensee with respect to Net Sales of such Product in such country is 2% or less, then Tonix shall pay to OyaGen 10% of the royalties received by Tonix or its Affiliate with respect to Net Sales of such Product in such country by such compulsory licensee.

ARTICLE 5

PAYMENT; RECORDS; AUDITS

5.1 Payment; Reports. Royalties under Section 4.3 shall be calculated and reported for each calendar quarter during the Royalty Term and shall be paid within sixty (60) days after the end of the calendar quarter. Each payment of royalties shall be accompanied by a report of Net Sales of Products by Tonix and Related Parties in sufficient detail to permit confirmation of the accuracy of the payment made, including gross sales and Net Sales of Products on a Product-by-Product and country-by-country basis, the deductions from gross sales (by major category as set forth in the definition of Net Sales), details of any royalty credits taken pursuant to Section 4.6 on a Third Party Patent License-by-Third Party Patent License basis, any applicable reductions or adjustments made pursuant to ARTICLE 4, the royalty payable, and the exchange rates used.

5.2 Exchange Rate; Manner and Place of Payment. All payment amounts in this Agreement are expressed in U.S. dollars, and all payments hereunder shall be payable in U.S. dollars. When conversion of payments from any foreign currency is required, such conversion shall be calculated using an exchange rate equal to the average of the interbank rates of exchange for such currency as reported at OANDA.com, or should such rates cease to be published by OANDA, a successor or replacement agreed upon by the parties, during the calendar quarter for which payment is due. All payments owed under this Agreement shall be made by wire transfer in immediately available funds to the bank and account designated in writing by OyaGen.

5.3 Tax Withholding. OyaGen will pay any and all taxes levied on account of any payments made to it under this Agreement. If Tonix is advised in writing by its attorneys or accountant that Tonix is required to withhold any portion of any payment made to OyaGen under this Agreement, Tonix shall (a) deduct such taxes from the payment made to OyaGen, (b) timely pay the taxes to the proper taxing authority, (c) send proof of payment to OyaGen and certify its receipt by the taxing authority within thirty (30) days following such payment, (d) reasonably cooperate with OyaGen, if requested, to obtain available reductions, credits or refunds of such taxes and (e) provide OyaGen a copy of such written advisement or instructions at least thirty (30) days, or such shorter period as reasonably practicable given the timing of the subject advice or instructions received by Tonix, in advance of such withholding. Without limiting the generality of the foregoing, upon request by OyaGen, Tonix shall provide OyaGen such information in Tonix's possession as may be reasonably necessary for OyaGen to obtain the benefit of any present or future treaty against double taxation which may apply to payments made to OyaGen under this Agreement.

5.4 Audits. Tonix shall keep (and shall cause its Affiliates and Sublicensees to keep) complete and accurate records pertaining to the sale or other disposition of Products in sufficient detail to permit OyaGen to confirm the accuracy of all royalty payments due hereunder for at least three (3) full calendar years following the end of the calendar year to which they pertain. OyaGen shall have the right, once annually, to cause an independent, certified public accountant reasonably acceptable to Tonix to audit such records solely to confirm Net Sales and royalties for a period covering not more than the preceding three (3) full calendar years. No calendar year shall be subject to audit under this section more than once. Such audits may be exercised during normal business hours upon reasonable prior written notice of not less than sixty (60) days to Tonix in the location where the records are maintained. The auditor will execute a confidentiality agreement in a form acceptable to Tonix with Tonix and will disclose to OyaGen only such information as is reasonably necessary to provide OyaGen with information regarding any actual or potential discrepancies between amounts reported and actually paid and amounts payable under this Agreement. The auditor will send a copy of the report to Tonix at the same time it is sent to OyaGen. The report sent to both Parties will include the methodology and calculations used to determine the results. Prompt adjustments shall be made by the Parties to reflect the results of such audit. OyaGen shall bear the full cost of such audit unless such audit discloses an underpayment by Tonix of more than five percent (5%) of the amount due for any calendar quarter (a "**Material Underpayment**") under this Agreement, in which case, Tonix shall bear the full cost of such audit and shall promptly remit to OyaGen the amount of such Material Underpayment. If such audit discloses an overpayment by Tonix, then Tonix will deduct the amount of such overpayment from future amounts otherwise owed to OyaGen under this Agreement.

ARTICLE 6

CONFIDENTIALITY AND PUBLICATION

6.1 Confidential Information. Except to the extent expressly authorized by this Agreement, each Party (in such capacity, the ***"Receiving Party"***) agrees that, during the Term and for seven (7) years thereafter, it shall keep confidential and shall not publish or otherwise disclose to any Third Party, and shall not use for any purpose other than as expressly provided for in this Agreement or any other written agreement between the Parties, any Confidential Information furnished or made available to it by or on behalf of the other Party (in such capacity, the ***"Disclosing Party"***). The Receiving Party shall use at least the same standard of care as it uses to protect proprietary or confidential information of its own (but in no event less than reasonable care) to ensure that it, and its and its Affiliates', employees, agents, consultants and other representatives, for clarification also including each Related Party, do not disclose or make any unauthorized use of the Confidential Information. The Receiving Party shall promptly notify the Disclosing Party upon discovery of any unauthorized use or disclosure of the Disclosing Party's Confidential Information. The OyaGen Technology, to the extent subject to the licenses to Tonix under this Agreement, shall be deemed the Confidential Information of Tonix notwithstanding the fact that it was furnished by OyaGen to Tonix in the first instance.

6.2 Exceptions. Confidential Information shall not include any information which the Receiving Party can prove by competent evidence: (a) is now, or hereafter becomes, through no act or failure to act on the part of the Receiving Party, generally known or available; (b) is known by the Receiving Party and/or any of its Affiliates at the time of receiving such information, as evidenced by its records; (c) is hereafter furnished to the Receiving Party and/or any of its Affiliates by a Third Party, as a matter of right and without restriction on disclosure; or (d) is independently discovered or developed by the Receiving Party and/or any of its Affiliates, without the use of or reference to the Confidential Information of the Disclosing Party. Any combination of features or disclosures shall not be deemed to fall within the exclusions set forth in the preceding clauses (a) and (b) merely because individual features are published or available to the general public or in the rightful possession of the Receiving Party unless the combination itself and principle of operation are published or available to the general public or in the rightful possession of the Receiving Party.

6.3 Authorized Disclosure. Notwithstanding the provisions of Section 6.1, the Receiving Party may disclose Confidential Information of the Disclosing Party as expressly permitted by this Agreement, or if and to the extent such disclosure is reasonably necessary in the following instances:

(a) filing or prosecuting Patents as permitted by this Agreement;

(b) enforcing such Party's rights under this Agreement (including registering the licenses granted hereunder with applicable authorities) and in performing its obligations under this Agreement.

(c) prosecuting or defending litigation as permitted by this Agreement;

(d) complying with applicable court orders, applicable laws, rules or regulations, or the listing rules of any exchange on which the Receiving Party's securities are traded;

(e) disclosure to Affiliates, actual and potential licensees and sublicensees, employees, consultants or agents of the Receiving Party who have a need to know such information in order for the Receiving Party to exercise its rights or fulfill its obligations under this Agreement, provided, in each case, that any such Affiliate, actual or potential licensee or sublicensee, employee, consultant or agent agrees to be bound by terms of confidentiality and non-use comparable in scope to those set forth in this ARTICLE 6; and

(f) disclosure to Third Parties in connection with due diligence or similar investigations by such Third Parties, and disclosure to potential Third Party investors or acquirers in confidential financing documents, provided, in each case, that any such Third Party agrees to be bound by reasonable obligations of confidentiality and non-use.

Notwithstanding the foregoing, in the event the Receiving Party is required to make a disclosure of the Disclosing Party's Confidential Information pursuant to Section 6.3(c) or 6.3(d), it will, except where impracticable, give reasonable advance notice to the Disclosing Party of such disclosure and use efforts to secure confidential treatment of such information at least as diligent as the Receiving Party would use to protect its own confidential information, but in no event less than reasonable efforts. In any event, the Receiving Party agrees to take all reasonable action to avoid disclosure of Confidential Information hereunder.

6.4 Publications. Tonix and its Affiliates shall have the right to publish the results of their development activities, including clinical trials, with respect to Compounds and/or Products in the Field. OyaGen shall have the right to review and comment on any material proposed for disclosure or publication by Tonix or its Affiliate, such as by oral presentation, manuscript or abstract that includes Confidential Information of OyaGen. Before any such material is submitted for publication or disclosure (other than oral presentation materials and abstracts, which are addressed below), Tonix shall deliver a complete copy to OyaGen at least thirty (30) days prior to submitting the material to a publisher or initiating such other disclosure, and OyaGen shall review any such material and give its comments to Tonix within ten (10) days of the delivery of such material to OyaGen which comments shall be considered by Tonix in good faith. With respect to oral presentation materials and abstracts, Tonix shall deliver a complete copy to OyaGen at least ten (10) business days prior to the anticipated date of the presentation, and OyaGen shall make reasonable efforts to expedite review of such materials and abstracts, and shall return such items as soon as practicable to Tonix with appropriate comments, if any, but in no event later than five (5) business days from the date of delivery to OyaGen which comments shall be considered by Tonix in good faith. Tonix shall comply, or cause its Affiliate to comply (as applicable), with OyaGen's requests to delete references to OyaGen's Confidential Information in any such material and, if applicable, agrees to delay any submission for publication or other public disclosure for a period of up to an additional sixty (60) days for the purpose of preparing and filing appropriate patent applications. OyaGen shall not publish or otherwise disseminate, including, but not limited to, in articles, posters, oral presentations or other formats, any information relating to Compounds and/or Products without the prior written consent of Tonix. Notwithstanding the preceding sentence, the article described on Schedule 6.4 which was submitted for publication prior to the Effective Date may be published subsequent to the Effective Date without Tonix's consent.

6.5 Publicity.

(a) Press Releases. The Parties shall jointly issue a press release acceptable to each Party to be released at an agreed upon time. Except as required by the applicable securities laws or the listing rules of any stock exchange on which securities issued by a Party or its Affiliates are traded, neither Party shall make any other public announcement concerning this Agreement or the subject matter hereof without the prior written consent of the other, which shall not be unreasonably withheld or delayed; provided that each Party may make any public statement in response to questions by the press, analysts, investors or those attending industry conferences or financial analyst calls, respond to queries by any exchange on which such Party's securities are traded, or issue press releases, so long as any such public statement, response, or press release is not inconsistent with prior public disclosures or public statements made in accordance with this Section 6.5 and which do not reveal non-public information about the other Party. In the event of a required public announcement, to the extent practicable under the circumstances, the Party making such announcement shall use reasonable efforts to provide the other Party with a copy of the proposed text of such announcement sufficiently in advance of the scheduled release to afford such other Party a reasonable opportunity to review and comment upon the proposed text, unless the proposed text is substantially the same as that used in any prior public disclosure, press release or public statement made in accordance with this Section 6.5.

(b) Filing of this Agreement. The Parties shall coordinate in advance with each other in connection with the filing of this Agreement (including redaction of certain provisions of this Agreement) with any securities authority or with any stock exchange on which securities issued by a Party or its Affiliate are traded, and each Party will use reasonable efforts to seek confidential treatment for the terms proposed to be redacted; provided that each Party will ultimately retain control over what information to disclose to any securities authority or stock exchange, as the case may be, and provided further that the Parties will use their reasonable efforts to file redacted versions with any governing bodies which are consistent with redacted versions previously filed with any other governing bodies. Other than such obligation, neither Party (nor any of its Affiliates) will be obligated to consult with or obtain approval from the other Party with respect to any filings to any securities authority or stock exchange. OyaGen hereby consents to Tonix's use of its name in any filing with a Regulatory Authority as well as any private placement memorandum or other investment document related to Tonix or its securities.

6.6 Prior Confidential Disclosure Agreement. As of the Effective Date, the terms of this ARTICLE 6 shall supersede any prior non-disclosure, secrecy or confidentiality agreement between the Parties (or their Affiliates) dealing with the subject of this Agreement, including the *Confidential Disclosure Agreement* between OyaGen and Tonix dated March 7, 2020. Any information disclosed by a Party pursuant to any such prior agreement shall be deemed Confidential Information of such Party for purposes of this Agreement.

ARTICLE 7

REPRESENTATIONS AND WARRANTIES; CERTAIN COVENANTS

7.1 Mutual Representations and Warranties. Each Party represents and warrants to the other that, as of the Effective Date: (a) it is duly organized and validly existing under the laws of its jurisdiction of incorporation or formation, and has full corporate or other power and authority to enter into this Agreement and to carry out the provisions hereof; (b) it is duly authorized to execute and deliver this Agreement and to perform its obligations hereunder, and the person or persons executing this Agreement on its behalf has been duly authorized to do so by all requisite corporate or partnership action; and (c) this Agreement is legally binding upon it, enforceable in accordance with its terms, and does not conflict with any agreement, instrument or understanding, oral or written, to which it is a party or by which it may be bound, nor violate any material law or regulation of any court, governmental body or administrative or other agency having jurisdiction over it; (d) it is not under any obligation, contractual or otherwise, to any party that conflicts with or is inconsistent in any material respect with the terms of this Agreement, or that would impede the diligent and complete fulfillment of its obligations hereunder; (e) there are no claims or investigations, pending or, to the knowledge of the representing Party, threatened against the representing Party or any of its Affiliates, at law or in equity, or before or by any governmental authority relating to the matters contemplated under this Agreement or that would materially adversely affect such representing Party's ability to perform its obligations hereunder.

7.2 OyaGen Representations and Warranties. OyaGen represents and warrants to Tonix that as of the Effective Date of this Agreement:

(a) **Exhibit A** attached hereto contains a true and complete list of the OyaGen Patent Rights existing on the Effective Date, each jurisdiction in which such OyaGen Patent Rights have been filed and the filing date in each such jurisdiction. The OyaGen Patent Rights listed in **Exhibit A** include all of the Patent Rights Controlled by OyaGen as of the Effective Date that Cover either Compound and/or any Product, or the manufacture, use, sale, offer for sale or import of the foregoing;

(b) to OyaGen's knowledge, the OyaGen Patent Rights listed in **Exhibit A** are being diligently prosecuted in accordance with Applicable Law in each jurisdiction in which they are filed;

(c) the OyaGen Patent Rights listed in **Exhibit A** have been filed and maintained properly and correctly in all jurisdictions in which they are filed and all applicable fees have been paid on or before the due date for payment;

(d) no reexamination, interference, invalidity, opposition, inter partes review, post grant review, nullity or similar claim or proceeding is pending, or, to OyaGen's knowledge, threatened with respect to any OyaGen Patent Right listed in **Exhibit A**;

(e) neither OyaGen, nor any of its Affiliates, has provided any Third Party written notice that such Third Party infringes or has infringed the OyaGen Patents Rights listed in **Exhibit A** or misappropriated or used, without authorization, the OyaGen Know-How;

(f) to OyaGen's knowledge, the manufacture, use, sale, offer for sale or import of a Compound, a Product or the practice under any OyaGen Patent Rights or OyaGen Know-How does not Infringe any issued patent, and neither OyaGen nor, any of its Affiliates has received written notice from any Third Party claiming that the manufacture, use, sale, offer for sale or import of a Compound, a Product or the practice under any OyaGen Patent Rights and/or OyaGen Know-How would Infringe the patent or other intellectual property rights of any Third Party; if OyaGen or any of its Affiliates receives any such written notice during the term of this Agreement, OyaGen shall promptly provide such written notice to Tonix;

(g) OyaGen (i) has the right to grant the licenses that it purports to grant in Section 2.1 (including, without limitation, that neither OyaGen nor any of its Affiliates have entered into any undertaking that limits, nor is subjected to any constraints that limit, its rights or freedom to grant the licenses); and (ii) has not, and neither has any of its Affiliates, granted to any Third Party any license or other right with respect a Compound, a Product, OyaGen Patent Rights and/or OyaGen Know-How that conflicts with the license and rights granted to Tonix herein;

(h) there are no licenses, sublicenses and other agreements to which OyaGen or any of its Affiliates is a party and pursuant to which any Third Party grants to OyaGen or any of its Affiliates (i) any license or other right to exploit a Compound or a Product, (ii) any covenant not to assert/sue or other immunity from suit under any intellectual property rights Covering a Compound or a Product, (iii) any ownership right or title, whether actual or contingent, to any intellectual property rights Covering a Compound or a Product, or (iv) an option or right of first refusal relating to any intellectual property rights Covering the exploitation of a Compound or a Products;

(i) there are no licenses, sublicenses and other agreements requiring OyaGen or any of its Affiliates to license, assign or otherwise grant rights to any Third Party for any additions, modifications or improvements made by or for OyaGen or its Affiliates to any OyaGen Patents Rights;

(j) neither OyaGen nor any of its Affiliates is a party to (i) any license, sublicense or other agreement to which and pursuant to which any Third Party is granted any license or other right to make, have made, use, sell, have sold, offer for sale, import or otherwise distribute or exploit a Compound or a Product, (ii) any covenant not to assert/sue or other immunity from suit under or any other rights to, any OyaGen Patent Rights and/or OyaGen Know-How, (iii) any ownership right or title, whether actual or contingent, to any OyaGen Patent Rights and/or OyaGen Know-How, or (iv) an option or right of first refusal relating to any OyaGen Patent Rights and/or OyaGen Know-How.

(k) except for the US Government's joint interest in the Patent Rights set forth on **Exhibit A-1**, OyaGen is the sole owner of all right, title and interest in and to the OyaGen Patent Rights and OyaGen Know-How, and no Third Party (including, but not limited to any governmental authority) has any rights in or to a Compound, a Product or any OyaGen Patent Rights and/or OyaGen Know-How for any reason, including, but not limited to as a result of development work performed by such Third Party or funding provided by such Third Party. For clarification, OyaGen represents that it is the sole owner of the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights, and the OyaGen [***] Patent Rights as set forth in **Exhibits A-2, A-3,** and **A-4**, respectively.;

(l) the Data Room Documents contain copies of all material and relevant information (including all material agreements) with respect to the OyaGen Patent Rights and/or OyaGen Know-How, in each case in the possession and Control of OyaGen, and such information is true, complete and correct;

(m) all current and former officers, employees, agents, advisors, consultants, contractors or other representatives of OyaGen or any of its Affiliates who are inventors of or have otherwise contributed in a material manner to the creation or development of any OyaGen Patent Rights and/or OyaGen Know-How have executed and delivered to OyaGen or any such Affiliate an assignment or other agreement regarding the protection of proprietary Confidential Information and the assignment to OyaGen or any such Affiliate of any OyaGen Patent Rights and/or OyaGen Know-How, the current form of which has been made available for review by Tonix. To OyaGen's knowledge, no current officer, employee, agent, advisor, consultant or other representative of OyaGen or any of its Affiliates is in violation of any term of any assignment or other agreement regarding the protection of OyaGen Patent Rights and/or OyaGen Know-How or of any employment contract or any other contractual obligation relating to the relationship of any such Person with OyaGen or any such Affiliate;

(n) (i) there are no claims, judgments or settlements against or owed by OyaGen or any of its Affiliates with respect to the OyaGen Patent Rights and/or OyaGen Know-How, and neither OyaGen nor any of its Affiliates is a party to any legal action, suit or proceeding relating to a Compound, a Product or any OyaGen Patent Rights and/or OyaGen Know-How, and (ii) nor has OyaGen or any of its Affiliates received any written communication from any Third Party, including, without limitation, any Regulatory Authority or other government agency, threatening such action, suit or proceeding;

(o) all tangible or recorded information and data provided by or on behalf of OyaGen or any of its Affiliates to Tonix related to a Compound, a Product, any OyaGen Patent Rights and/or OyaGen Know-How on or before the Effective Date in contemplation of this Agreement has been provided through the Data Room Documents and was and is true, accurate and complete in all material respects, and neither OyaGen nor any of its Affiliates have failed to disclose, or failed to cause to be disclosed, any such information or data related to a Compound, a Product, any OyaGen Patent Rights and/or OyaGen Know-How in its possession and Control that would cause the information and data that has been disclosed to be misleading in any material respect;

(p) neither OyaGen nor any of its Affiliates has obtained, or filed for, any INDs, NDAs or Marketing Approvals for any Compound and/or Product, and, to the best of OyaGen's knowledge, no other Person has obtained, or filed for, any INDs, NDAs or Marketing Approvals for any Compound and/or Product in the Field in the Territory;

(q) except as set forth on Schedule 7.2(q), there are no ongoing research or development activities (including, without limitation, any clinical trials) being conducted by or on behalf of OyaGen or any of its Affiliates with respect to Compounds or Products;

(r) (i) all research and development (including, without limitation, non-clinical studies and clinical trials) conducted by or on behalf of OyaGen or any of its Affiliates related to a Compound, a Product and/or the OyaGen Patent Rights and/or OyaGen Know-How prior to the Effective Date was conducted in compliance in all material respects with all Applicable Laws and, as applicable, GLP, GCP and/or GMP; and (ii) to OyaGen's knowledge, all research and development (including non-clinical studies and clinical trials) conducted related to a Compound, a Product and/or the OyaGen Patent Rights and/or OyaGen Know-How prior to the Effective Date was conducted in compliance in all material respects with all Applicable Laws and, as applicable, GLP, GCP and/or GMP;

(s) neither OyaGen nor any of its Affiliates, or its or their employees, officers, subcontractors or consultants who have rendered or shall render services relating to the Compound or Product (i) has ever been debarred or is subject to debarment or convicted of a crime for which an entity or person could be debarred under 21 U.S.C. Section 335a or any foreign equivalent thereof or (ii) has ever been under indictment for a crime for which a person or entity could be debarred under said Section 335a or any foreign equivalent thereof;

(t) neither OyaGen nor any of its Affiliates, directors, officers, employees, or any agent, representative, subcontractor or other third party acting for or on such its behalf, has, directly or indirectly, offered, paid, promised to pay, or authorized such offer, promise or payment, of anything of value, to any Person for the purposes of obtaining or retaining business through any improper advantage in connection with the development, commercialization or exploitation of a Compound or a Product, or that would otherwise violate any applicable Laws, rules and regulations concerning or relating to public or commercial bribery or corruption, and OyaGen's books, accounts, records and invoices related to the Compounds, the Products and the OyaGen Patent Rights and/or OyaGen Know-How are complete and accurate;

(u) with respect to any and all confidential information and any and all other materials used in development of a Compound, a Product and/or the OyaGen Patent Rights and/or OyaGen Know-How, OyaGen has the right under each such agreements to transfer such confidential information or other materials to Tonix and to grant Tonix the right to use such confidential information or other materials in the in accordance with the terms of this Agreement;

(v) the OyaGen Know-How has been kept confidential or has been disclosed to Third Parties only under terms of confidentiality and to the knowledge of OyaGen and its Affiliates, no breach of such confidentiality has been committed by any Third Party;

(w) neither OyaGen nor any of its Affiliates has violated the FCPA or Export Control Laws in connection with the development of a Compound, a Product and/or the OyaGen Patent Rights and/or OyaGen Know-How;

(x) OyaGen is a party to that certain Research Collaboration Agreement (the **"Collaboration Agreement"**), by and between the National Institute of Allergy and Infectious Diseases ("**NIAID**"), dated as of November 22, 2016, as amended pursuant to which NIAID performed certain screenings related to the Compounds effectiveness against SARS-COV-2, Lassa Virus and Vaccinia Virus and and the resulting data formed the basis for certain of the OyaGen Patent Rights included within the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights and the OyaGen [***] Patent Rights (the "Screening Data").

(y) OyaGen is authorized to transfer the Screening Data to Tonix and has obtained any necessary consents from NIAID for such transfer. OyaGen has the right to use any data generated under the Collaboration Agreement relating to the effectiveness of the Compounds against SARS-CoV-2, including, without limitation, in any patent applications, scientific articles, or other publications.to Tonix Pharmaceutical Holding Corp.;

(b) OyaGen owns all right, title and interest, and no Third Party, including, without limitation, the NIAID, the NIH or any other governmental authority, has any right title or interest in or to or any basis to claim that it or any of its staff is or should be an inventor with respect to the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights and/or the OyaGen [***] Patent Rights. If during the course of the Term of this Agreement the US Government (by NIAID or NIH) is inserted as a joint owner of any of the OyaGen [***] Patent Rights, OyaGen [***] Patent Rights, and/or OyaGen [***] Patent Rights as set forth in **Exhibits A-2, A-3,** and **A-4**, respectively, OyaGen will negotiate in accordance with Section 2.6(b) so as to exclusively sublicense NIAID or NIH's portion of any such Patent Rights to Tonix; and

EXCEPT AS SPECIFICALLY SET FORTH IN THIS AGREEMENT, OYAGEN IS LICENSING THE OYAGEN PATENT RIGHTS AND OYAGEN KNOW-HOW ON AN "AS IS" BASIS, AND OYAGEN 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 OYAGEN PATENT RIGHTS AND OYAGEN KNOW-HOW 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, TITLE, FITNESS, ADEQUACY OR SUITABILITY FOR A PARTICULAR PURPOSE, USE OR RESULT; ANY WARRANTIES AS TO THE VALIDITY OF ANY PATENT; AND, ANY WARRANTIES OF FREEDOM FROM INFRINGEMENT OF ANY DOMESTIC OR FOREIGN PATENTS, COPYRIGHTS, TRADE SECRETS OR OTHER PROPRIETARY RIGHTS OF ANY PARTY.

7.3 OyaGen Covenant. In addition to any covenants made by OyaGen elsewhere in this Agreement, OyaGen hereby covenants to Tonix that during the Term, OyaGen will not grant any Third Party any license or other right with respect to any Compound, the OyaGen Patent Rights and/or the OyaGen Know-How, in each case for use in the Field in the Territory, in derogation of the license and rights granted to Tonix hereunder.

7.4 Tonix Representations and Warranties. Tonix represents and warrants to OyaGen that as of the Effective Date of this Agreement neither Tonix nor any of its Affiliates is debarred or disqualified under the Act or comparable Applicable Laws outside the United States.

7.5 Mutual Covenants. In addition to any covenants made by a Party elsewhere in this Agreement, each Party hereby covenants to the other as follows:

(a) neither such Party nor any of its Affiliates will knowingly employ or use the services of any Person who is debarred or disqualified under United States law, including 21 U.S.C. §335a, or any foreign equivalent thereof, in connection with activities relating to any Product; and in the event that such Party becomes aware of the debarment or disqualification or threatened debarment or disqualification of any Person providing services to such Party or any of its Affiliates with respect to any activities relating to any Product, such Party will immediately notify the other Party in writing and such Party will cease, or cause its Affiliate to cease (as applicable), employing, contracting with, or retaining any such Person to perform any services relating to any Product;

(b) neither such Party nor any of its Affiliates will, in connection with the exercise of its rights or performance of its obligations under this Agreement, directly or indirectly through Third Parties, knowingly pay, promise or offer to pay, or authorize the payment of, any money or give any promise or offer to give, or authorize the giving of anything of value to a public official or entity or other Person for purpose of obtaining or retaining business for or with, or directing business to, any Person, including such Party and its Affiliates, nor will such Party or any of its Affiliates directly or indirectly knowingly promise, offer or provide any corrupt payment, gratuity, emolument, bribe, kickback, illicit gift or hospitality or other illegal or unethical benefit to a public official or entity or any other Person in connection with the exercise of such Party's rights or performance of such Party's obligations under this Agreement; and

(c) neither such Party nor any of its Affiliates (or any of their respective employees and contractors), in connection with the exercise of such Party's rights or performance of such Party's obligations under this Agreement, shall knowingly cause the other Party to be in violation of the FCPA or Export Control Laws.

7.6 Performance by Affiliates, Sublicensees and Subcontractors. The Parties recognize that each Party may perform some or all of its obligations or exercise some or all of its rights under this Agreement through one or more Affiliates, subcontractors, or, in the case of Tonix, a Related Party; provided, in each case, that (a) none of the other Party's rights hereunder are diminished or otherwise adversely affected as a result of such delegation or subcontracting, (b) each such Affiliate, subcontractor or Related Party undertakes in writing obligations of confidentiality and non-use regarding Confidential Information and ownership of Inventions which are substantially the same as those undertaken by the Parties pursuant to ARTICLE 6 and Section 8.1, and (c) notwithstanding the foregoing or anything to the contrary in this Agreement, such Party shall at all times be fully responsible for the performance and payment obligations of its Affiliate, subcontractor or Related Party.

7.7 Limitation of Liability. EXCEPT FOR LIABILITY FOR BREACH OF ARTICLE 6, A PARTY'S INDEMNIFICATION OBLIGATIONS UNDER ARTICLE 10, OR IN THE CASE OF GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FRAUD OR ILLEGAL ACTIVITY, OR IN THE CASE OF OYAGEN, A BREACH OF SECTION 2.2 OR 7.3, NEITHER PARTY SHALL BE ENTITLED TO RECOVER FROM THE OTHER PARTY ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES IN CONNECTION WITH THIS AGREEMENT OR ANY LICENSE GRANTED HEREUNDER.

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.

ARTICLE 8

INTELLECTUAL PROPERTY

8.1 Ownership. As between the Parties, OyaGen is and shall at all times be the sole and exclusive owner of all right, title and interest in and to the OyaGen Technology, other than the OyaGen [***] Patent Rights jointly owned by OyaGen and The United States of America as represented by The Secretary of Health and Human Services, and other than Joint Inventions and Joint Patent Rights, and Tonix is and shall at all times be the sole and exclusive owner of all right, title and interest in and to the Tonix Technology, other than Joint Inventions and Joint Patent Rights. A Party shall have and retain all right, title and interest in any Invention made solely by one or more employees or agents of such Party and or its Affiliates or other persons acting under its authority. The Parties shall jointly own rights in any Invention made jointly by one or more employees or agents of each Party and/or such Party's Affiliates or other persons acting under its authority (**"*Joint Inventions*"**) and Patent Rights therein (**"*Joint Patent Rights*"**). For clarity, Inventions developed exclusively by one Party and such Party's Affiliates shall not be considered Joint Inventions. Subject to the rights and licenses granted under this Agreement, each Party shall have the right to practice and use, and grant licenses to practice and use, any Joint Inventions and Joint Patent Rights without the other Party's consent and has no duty to account to the other Party for such practice, use or license, and each Party hereby waives any right it may have under the laws of any country to require any such consent or accounting. Each Party shall be liable with respect to its own employees for compliance with any applicable legislation and its own policies concerning employee inventions, including payment of employee invention awards (if any).

8.2 Patent Prosecution and Maintenance.

(a) OyaGen Patent Rights. Prior to the Effective Date, OyaGen shall control the preparation, filing, prosecution and maintenance of the OyaGen Patent Rights at its expense. After the Effective Date, Tonix shall have the right, but not the obligation to control the preparation, filing, prosecution and maintenance including *inter partes* review or post-grant review proceedings, oppositions, nullity proceedings and the like of OyaGen Patent Rights at Tonix's sole expense and by counsel of Tonix's choice, in consultation with OyaGen and counsel of OyaGen's choice (which shall be at OyaGen's expense). Tonix shall keep OyaGen informed of progress with regard to the preparation, filing, prosecution and maintenance of such OyaGen Patent Rights and shall provide to OyaGen copies of all official communications issued by a patent office (including but not limited to pre-examination notices, restriction requirements, and office actions) within fifteen (15) business days of Tonix's receipt thereof, and shall provide to OyaGen copies of all patent office submissions within thirty (30) days of filing. The Parties intend that consultation under this Section 8.2(a) between the Parties relating to the OyaGen Patent Rights will be in accordance with a common interest in the validity, enforceability, and scope of the OyaGen Patent Rights. 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 and attorney-client privilege basis and shall not disclose such consultation or information to any Party without the other Party's prior written consent. Except to the extent required by applicable law, under no circumstances shall Tonix or Tonix's counsel amend the claims of any of the patent applications or patents which are part of the OyaGen Patent Rights in a manner that would change ownership from OyaGen as the sole owner with respect to the OyaGen [***] Patent Rights, the OyaGen [***] Patent Rights, and/or the OyaGen [***] Patent Rights. In the event that Tonix desires to abandon or cease prosecution or maintenance of any OyaGen Patent Right in any country or jurisdiction (such country or jurisdiction, the **"Abandoned Territory"**), Tonix shall provide written notice to OyaGen of such intention to abandon no later than thirty (30) days prior to the next deadline for any action that must be taken with respect to such OyaGen Patent Right in the relevant patent office (the "**Abandonment Notice**"). In such case, upon receipt of a written request by OyaGen delivered no later than fifteen (15) days after receipt of the Abandonment Notice to assume responsibility for prosecution and maintenance of such OyaGen Patent Right, Tonix shall allow OyaGen at its sole cost and expense and by counsel of its own choice, to assume such responsibility or at its sole discretion abandon or cease the prosecution or maintenance of such application or patent at issue. Tonix shall reimburse OyaGen any extension fees required to keep any such OyaGen Patent Right pending that were due at the time of delivery of such OyaGen Patent Right to OyaGen.

(b) Joint Patent Rights. Tonix shall have the first right, but not the obligation, to prepare, file, prosecute and maintain all Joint Patent Rights, at Tonix's sole expense and by counsel of Tonix's choice. Tonix shall keep OyaGen reasonably informed of progress with regard to the preparation, filing, prosecution and maintenance of the Joint Patent Rights, and shall provide to OyaGen copies of all official communications issued by a patent office (including but not limited to pre-examination notices, restriction requirements, and office actions) relating to the Joint Patent Rights within fifteen (15) business days of Tonix's receipt thereof, and shall provide to OyaGen copies of all material patent office submissions within a reasonable amount of time following submission thereof by Tonix. In the event that Tonix desires to abandon or cease prosecution or maintenance of any Joint Patent Right, Tonix shall provide written notice to OyaGen of such intention to abandon promptly after Tonix makes such determination, which notice shall be given no later than thirty (30) days prior to the next deadline for any action that must be taken with respect to such Joint Patent Right in the relevant patent office. In such case, OyaGen shall have the right, in its discretion, exercisable upon written notice to Tonix delivered no later than fifteen (15) days after receipt of notice from Tonix, to assume responsibility for prosecution and maintenance of such Joint Patent Right, at its sole cost and expense and by counsel of its own choice. Tonix shall reimburse OyaGen any extension fees required to keep any such Joint Patent Right pending that were due at the time of delivery of such Joint Patent Right to OyaGen.

(c) Tonix Patent Rights. Except as provided in Section 8.2(b) with respect to Tonix's interest in Joint Patent Rights, Tonix shall have the sole right, but not the obligation, to control the preparation, filing, prosecution and maintenance of Tonix Patent Rights at Tonix's sole expense and by counsel of its choice.

(d) Cooperation of the Parties. Each Party agrees to cooperate fully in the preparation, filing, prosecution and maintenance of Patent Rights under this Agreement and in the obtaining and maintenance of any patent term extensions, supplementary protection certificates and the like with respect to any Patent Right as well as in registering the licenses granted hereunder with the applicable authorities. Such cooperation includes, but is not limited to: (i) executing all papers and instruments, or requiring its employees or contractors to execute such papers and instruments, so as to effectuate the joint ownership of Joint Inventions and Joint Patent Rights set forth in Section 8.1, and to enable the other Party to apply for and to prosecute patent applications in any country in accordance with the foregoing provisions of this Section 8.2; and (ii) promptly informing the other Party of any matters coming to such Party's attention that may affect the preparation, filing, prosecution or maintenance of any such patent applications.

8.3 Enforcement and Defense of Patent Rights. Each Party shall notify the other Party in writing within 10 Business Days (except as expressly set forth below) of becoming aware of any alleged or threatened infringement by a Third Party of any of the OyaGen Patent Rights and/or Joint Patent Rights (***"Infringement"***), including (x) any such alleged or threatened Infringement on account of a Third Party's manufacture, use or sale of a Product in the Field, (y) any certification filed in the United States under 21 U.S.C. §355(b)(2) or 21 U.S.C. §355(j)(2) or similar provisions in other jurisdictions in connection with an ANDA (an Abbreviated New Drug Application in the United States or a comparable application for Marketing Approval under Applicable Law in any country other than the United States) or other request for approval or marketing authorization for a Product in the Field (a **"Patent Certification"**), and (z) any declaratory judgment action filed by a Third Party related to a Product in the Field alleging the invalidity, unenforceability or non-infringement of any of the OyaGen Patent Rights or Joint Patent Rights ((x)-(z), collectively, **"Competitive Infringement"**); provided, however, that each Party shall notify the other Party of any Patent Certification regarding any OyaGen Patent Right or Joint Patent Right that it receives, and such Party shall provide the other Party with a copy of such Patent Certification, within five (5) days of receipt.

(a) Competitive Infringement. Tonix shall have the first right, but not the obligation, to bring (or defend) and control any action or proceeding with respect to Competitive Infringement of a OyaGen Patent Right or a Joint Patent Right, in each case that Covers a Product (collectively, the "**Relevant Patent Rights**"), at Tonix's own expense and by counsel of its own choice. Tonix will be permitted to name OyaGen as a co-party in any such action and shall furnish OyaGen with copies of any documents related to such proceedings. If Tonix fails to bring any such action or proceeding with respect to Competitive Infringement of any Relevant Patent Right within ninety (90) days following the notice of alleged Competitive Infringement, OyaGen shall have the right, but not the obligation, to bring (or defend) and control any such action at its own expense and by counsel of its own choice, and Tonix shall have the right, at its own expense, to be represented in any such action by counsel of its own choice.

(b) Other Infringement. The Parties shall mutually agree on a case-by-case basis (A) whether to bring (or defend) and control any action or proceeding with respect to Competitive Infringement of any Patent Right that is not a Relevant Patent Right, (B) which Party would bring (or defend) and control such action, and (C) how the expenses of, and any recovery from, any such action would be allocated.

(c) Tonix Patent Rights. Tonix shall have the sole right, but not the obligation, to bring (or defend) and control any action or proceeding with respect to infringement of any Tonix Patent Right at its own expense and by counsel of its own choice.

(d) Cooperation. In the event a Party brings (or defends) an Infringement action in accordance with this Section 8.3, or in the event a Party is entitled to bring (or defend) an infringement action in accordance with this Section 8.3 but lacks standing to do so, the other Party shall cooperate fully, including, if required to bring (or defend) such action, the furnishing of a power of attorney or being named as a party. Neither Party shall enter into any settlement or compromise of any action under this Section 8.3 which would in any manner alter, diminish, or be in derogation of the other Party's rights under this Agreement without the prior written consent of such other Party, which shall not be unreasonably withheld. In any infringement suit as either Party may institute to enforce the OyaGen Patent Rights or in any declaratory judgment action alleging invalidity or non-infringement of any OyaGen Patent Rights brought against OyaGen or Tonix, the other Party shall, at the request and expense of the Party initiating or defending the suit or action, cooperate in all reasonable respects and make reasonable requests to have its employees testify when requested and make available relevant records, papers, information, specimens and the like.

(e) Expenses. In the event that Tonix undertakes the enforcement or defense of the OyaGen Patent Rights or Joint Patent Rights by litigation or settlement action, from the date of Tonix's filing of a litigation pleading, notice of appearance or other litigation initiating document, Tonix may withhold up to fifty percent (50%) of the royalties otherwise thereafter due OyaGen under Section 4.3 and apply the same toward reimbursement of its expenses, including reasonable attorney's fees in connection therewith.

(f) Recovery. Except as otherwise agreed by the Parties in connection with a cost-sharing arrangement, any recovery realized by a Party as a result of any action or proceeding pursuant to this Section 8.3, whether by way of settlement or otherwise, shall be applied first to reimburse the documented out-of-pocket legal expenses and costs of the Party that brought (or defended) and controlled such action or proceeding incurred in connection with such action or proceeding, and second to reimburse the documented out-of-pocket legal expenses and costs of the other Party incurred in connection with such action or proceeding, and any remaining amounts shall be retained by the Party that brought (or defended) and controlled such action; provided, however, that:

(i) any recovery realized by Tonix as a result of any action brought (or defended) and controlled by Tonix pursuant to Section 8.3(a) or Section 8.3(b) (after reimbursement of the Parties' documented out-of-pocket legal expenses and costs relating to the action or proceeding) shall be allocated as follows: (1) compensatory damages shall, if awarded, be treated as Net Sales of Products in the quarter in which such damages are received for purposes of Section 4.3, but only to the extent that OyaGen has not been directly awarded such damages in the litigation; and (2) non-compensatory damages shall be divided 80% to Tonix and 20% to OyaGen; and

(ii) any recovery realized by OyaGen as a result of any action brought and controlled by OyaGen pursuant to Section 8.3(a) or Section 8.3(b) (after reimbursement of each Party's documented out-of-pocket legal expenses and costs relating to the action or proceeding) shall be allocated 80% to OyaGen and 20% to Tonix.

8.4 Patent Term Extensions.

(a) OyaGen Patent Rights. Tonix shall have the right to determine the OyaGen Patent Rights for which it will apply for extension of patent term (including, without limitation, a supplementary protection certificate) in any country and/or jurisdiction for any Product in the Field. Tonix shall file for any such extension at Tonix's cost and expense. OyaGen shall provide all reasonable assistance to Tonix in connection with such filings, including allowing Tonix to file for the extension or supplementary protection certificate in Oyagen's name. In the event that Tonix desires to not apply for such patent extension, Tonix shall provide written notice to OyaGen of such intention not to file no later than thirty (30) days prior to the next deadline for any action that must be taken with respect to such OyaGen Patent Right in the relevant patent office. In such case, upon receipt of a written request by OyaGen to assume responsibility for prosecution and maintenance of such patent extension, Tonix shall allow OyaGen at its sole cost and expense and by counsel of its own choice, delivered no later than fifteen (15) days after receipt of notice from OyaGen to assume such responsibility.

(b) Joint Patent Rights. Tonix shall have the right to determine the Joint Patent Rights for which it will apply for patent term extension (including, without limitation, a supplementary protection certificate) in any country and/or jurisdiction for any Product in the Field, and Tonix shall file for any such extension at Tonix's cost and expense. Each Party shall provide all reasonable assistance to the other Party in connection with such filings including allowing the Party filing the request to file in the other Party's name alone or jointly provided that the Party filing for any such extension shall pay or reimburse any out-of-pocket costs incurred by the other Party in providing such assistance.

(c) Tonix Patent Rights. Tonix shall have the sole right to apply for extension of term for any Tonix Patent Right in any country and/or jurisdiction for any product, including, without limitation, any Product in the Field, at Tonix's sole cost and expense.

8.5 Infringement of Third Party Rights. Each Party shall promptly notify the other in writing of any allegation by a Third Party that the activity of either Party pursuant to this Agreement infringes or may infringe the intellectual property rights of such Third Party. Neither Party shall have the right to settle any patent infringement litigation under this Section 8.5 in a manner that diminishes the rights or interests of the other Party without the written consent of such other Party (which shall not be unreasonably withheld).

ARTICLE 9

TERM AND TERMINATION

9.1 Term. The term of this Agreement shall commence on the Effective Date and, unless earlier terminated in accordance with this ARTICLE 9, continue until the expiration of the Royalty Term (the ***"Term"***).

9.2 Termination for Material Breach.

(a) Each Party shall have the right to terminate this Agreement in its entirety upon written notice to the other Party if such other Party is in material breach of this Agreement and has not cured such breach within ninety (90) days after notice from the terminating Party indicating the nature of such breach (however such cure period shall be reduced to thirty (30) days in the event of a payment breach), or if such other Party is dissolved or liquidated or takes any corporate action for such purpose; makes a general assignment for the benefit of creditors; or has a receiver, trustee, custodian or similar agent appointed by order of any court of competent jurisdiction to take charge of or sell any material portion of its property or business. Any such termination shall become effective at the end of the above-stated cure period unless the breaching Party has cured such breach prior to the end of such period. Any right to terminate under this Section 9.2(a) shall be stayed and the cure period tolled in the event that, during any cure period, the Party alleged to have been in material breach shall have initiated dispute resolution in accordance with ARTICLE 11 with respect to the alleged breach, which stay and tolling shall continue until such dispute has been resolved in accordance with ARTICLE 11.

(b) For clarity, in the event of material breach of this Agreement by OyaGen that is not cured within the applicable notice period set forth in Section 9.2(a), Tonix, at its sole discretion, may either:

(i) terminate this Agreement in accordance with Section 9.2(a) (in addition to pursuing any remedy that may be available to Tonix at law or in equity as a result of OyaGen's breach of this Agreement); or

(ii) elect (A) not to terminate this Agreement, (B) to retain the license granted under Section 2.1, subject to all terms and conditions hereof, and (C) pursue any remedy that may be available to Tonix at law or in equity as a result of OyaGen's breach of this Agreement, without prejudice to Tonix's right to terminate this Agreement at a later date pursuant to Section 9.2 (for that uncured material breach or any other uncured material breach of this Agreement by OyaGen) or pursuant to Section 9.3.

9.3 At-Will Termination by Tonix. Tonix shall have the right to terminate this Agreement on a country-by-country basis for any reason or for no reason at any time upon sixty (60) days' prior written notice to OyaGen, provided Tonix's termination shall not be deemed to cure any breach existing as of the date of such termination.

9.4 Effect of Expiration or Termination.

(a) Expiration. Upon expiration (but not on earlier termination) of this Agreement, all licenses granted by OyaGen to Tonix that were in effect immediately prior to such expiration shall survive on a non-exclusive, fully-paid, royalty-free basis.

(b) Any Termination. Upon any termination of this Agreement prior to its expiration, (i) the license (on a country-by-country basis in the event of partial termination by Tonix under Section 9.3) granted to Tonix pursuant to Section 2.1 shall automatically terminate and revert to OyaGen, (ii) all other rights and obligations of the Parties under this Agreement shall terminate, except as expressly provided below in Section 9.5, and (iii) all intellectual property, ownership, marketing and manufacturing rights with respect to the OyaGen Technology shall revert to OyaGen without limitation (on a country-by-country basis in the event of partial termination by Tonix under Section 9.3).

9.5 Accrued Obligations; Survival. Neither expiration nor any termination of this Agreement shall relieve either Party of any obligation or liability accruing prior to such expiration or termination, nor shall expiration or any termination of this Agreement preclude either Party from pursuing all rights and remedies it may have under this Agreement, at law or in equity, with respect to breach of this Agreement. In addition, the Parties' rights and obligations under Sections 3.2(b), 8.1, Sections 8.2 – 8.5 (inclusive, but in each case, only with respect to Joint Patent Rights), 9.4, 9.6, 9.7, 10.1, 10.2, 10.3 and ARTICLES 6, 7, 11 and 12 and this Section 9.5 of this Agreement, along with any other terms or conditions that would be required to survive to give effect to the enumerated surviving provisions, shall survive expiration or any termination of this Agreement.

9.6 Return of Confidential Information. Within thirty (30) days following the expiration or termination of this Agreement, except to the extent that a Party retains a license from the other Party as provided in this ARTICLE 9, each Party shall promptly return to the other Party, or delete or destroy, all relevant records and materials in such Party's possession or control containing Confidential Information of the other Party; provided that such Party may keep one copy of such materials for archival purposes only subject to a continuing confidentiality obligations.

9.7 Damages; Relief. Termination of this Agreement shall not preclude either Party from claiming any other damages, compensation or relief that it may be entitled to hereunder.

ARTICLE 10

INDEMNIFICATION

10.1 Indemnification by Tonix. Tonix shall indemnify, defend, and hold harmless each OyaGen Indemnitee from and against any and all actions, suits, claims, demands, prosecutions, liabilities, costs, expenses, damages, deficiencies, losses or obligations (including reasonable and documented legal expenses and attorneys' fees) (**"Losses"**) based on, arising out of, or relating to claims by any Third Party (a "**Claim**") arising in connection with this Agreement to the extent arising out of (a) the gross negligence, willful misconduct, fraud or illegal activity of the Tonix Indemnitees and their subcontractors, (b) the breach by the Tonix Indemnitees and their subcontractors of the confidentiality obligations set forth in ARTICLE 6, (c) the breach by the Tonix Indemnitees and their subcontractors of Section 3.5, (d) the breach by Tonix of the representations, warranties and covenants set forth in ARTICLE 7, and (e) the use by Tonix Indemnitees and their subcontractors of the OyaGen Technology, to the extent subject to the licenses to Tonix under this Agreement, or any Product, in each case including but not limited to the exploitation, development, manufacture, use, sale, offer for sale or other disposition thereof; except, in each case of (a) – (e), to the extent such Losses result from any Claim for which OyaGen is obligated to indemnify the Tonix Indemnitees under Section 10.2. Further, in the event that OyaGen or any of its Affiliates becomes a subcontractor of Tonix or any Tonix Indemnitee, the acts and omissions of OyaGen and/or such Affiliate(s) will not be indemnifiable under this Section 10.1.

10.2 Indemnification by OyaGen. OyaGen shall indemnify, defend, and hold harmless each Tonix Indemnitee from and against any and all Losses based on, arising out of, or relating to claims by any Third Party arising in connection with this Agreement to the extent arising out of (a) the gross negligence, willful misconduct, fraud or illegal activity of any OyaGen Indemnitee, (b) patent infringement arising out of the exercise of rights under the OyaGen Patent Rights, (c) misappropriation of trade secrets arising out of the exercise of rights under the OyaGen Know-How, (d) the breach by any OyaGen Indemnitee of the confidentiality obligations set forth in ARTICLE 6; and (e) the breach by OyaGen of the representations, warranties and covenants set forth in Section 2.2 and ARTICLE 7; except, in each case of (a) – (e), to the extent such Losses result from any Claim for which Tonix is obligated to indemnify the OyaGen Indemnitees under Section 10.1.

10.3 Control of Defense. In the event a Party (the **"Indemnified Party"**) seeks indemnification under Section 10.1 or 10.2, it shall inform the other Party (the **"Indemnifying Party"**) of a claim as soon as reasonably practicable after it receives notice of the claim (it being understood and agreed, however, that the failure by an Indemnified Party to give notice of a claim as provided in this Section 10.3 shall not relieve the Indemnifying Party of its indemnification obligation under this Agreement except and only to the extent that such Indemnifying Party is actually damaged as a result of such failure to give notice), shall permit the Indemnifying Party to assume direction and control of the defense of the claim (including the right to settle the claim solely for monetary consideration) using counsel reasonably satisfactory to the Indemnified Party, and shall cooperate as requested (at the expense of the Indemnifying Party) in the defense of the claim. If the Indemnifying Party does not assume control of such defense within 15 days after receiving notice of the claim from the Indemnified Party, the Indemnified Party shall control such defense and, without limiting the Indemnifying Party's indemnification obligations, the Indemnifying Party shall reimburse the Indemnified Party for all costs, including reasonable and documented attorney fees, incurred by the Indemnified Party in defending itself within thirty (30) days after receipt of any invoice therefor from the Indemnified Party. The Party not controlling such defense may participate therein at its own expense. The Party controlling such defense shall keep the other Party advised of the status of such action, suit, proceeding or claim and the defense thereof and shall consider recommendations made by the other Party with respect thereto. The Indemnified Party shall not agree to any settlement of such action, suit, proceeding or claim without the prior written consent of the Indemnifying Party, which shall not be unreasonably withheld, delayed or conditioned. The Indemnifying Party shall not agree to any settlement of such action, suit, proceeding or claim or consent to any judgment in respect thereof that does not include a complete and unconditional release of the Indemnified Party from all liability with respect thereto, that imposes any liability or obligation on the Indemnified Party or that acknowledges fault by the Indemnified Party without the prior written consent of the Indemnified Party. If the Parties cannot agree as to the application of Section 10.1 or 10.2 to any claim, pending resolution of the dispute pursuant to ARTICLE 11 the Parties may conduct separate defenses of such claims, with each Party retaining the right to claim indemnification from the other Party in accordance with Section 10.1 or 10.2, as applicable, upon resolution of the underlying claim.

10.4 Insurance. Each Party shall procure and maintain adequate levels of insurance that are consistent with industry standards for similarly situated companies, including comprehensive or commercial general liability insurance (including contractual liability and product liability). Such insurance shall include commercially reasonable levels of insurance as may be customary in light of status of activities being conducted. It is understood that such insurance shall not be construed to create a limit of either Party's liability with respect to its indemnification obligations under this ARTICLE 10 or otherwise. Each Party shall provide the other Party with written evidence of such insurance upon request. Each Party shall provide the other Party with written notice at least 30 days prior to the cancellation, non-renewal or material change in such insurance which materially adversely affects the rights of the other Party hereunder.

ARTICLE 11

DISPUTE RESOLUTION

11.1 Disputes. Any claim, dispute, or controversy as to the breach, enforcement, interpretation or validity of this Agreement (each, a ***"Dispute"***) that cannot be resolved by the Parties within thirty (30) days that a Party is notified of such Dispute, will be referred to the Chief Executive Officer of OyaGen and the Chief Executive Officer of Tonix for attempted resolution, with each party exercising good faith in such attempt. In the event such executives are unable to resolve such Dispute within thirty (30) days of such Dispute being referred to them, then, the Parties shall be free to pursue legal remedies in accordance with the terms of this Agreement. This Section 11.1 shall not prohibit either Party from seeking equitable relief in any court of competent jurisdiction.

ARTICLE 12

MISCELLANEOUS

12.1 Rights Upon Bankruptcy. All rights and licenses granted under or pursuant to this Agreement are, and shall otherwise be deemed to be, for purposes of Section 365(n) of Title 11 of the United States Code and other similar laws in any jurisdiction outside the U.S. (collectively, the ***"Bankruptcy Laws"***), licenses of rights to be "intellectual property" as defined under the Bankruptcy Laws. If a case is commenced during the Term by or against a Party under Bankruptcy Laws then, unless and until this Agreement is rejected as provided in such Bankruptcy Laws, such Party (in any capacity, including debtor-in-possession) and its successors and assigns (including a trustee) shall perform all of the obligations provided in this Agreement to be performed by such Party. If a case is commenced during the Term by or against a Party under the Bankruptcy Laws, and this Agreement is rejected as provided in the Bankruptcy Laws and the other Party elects to retain its rights hereunder as provided in the Bankruptcy Laws, then the Party subject to such case under the Bankruptcy Laws (in any capacity, including debtor-in-possession) and its successors and assigns (including a Title 11 trustee), shall provide to the other Party copies of all Information necessary for such other Party to prosecute, maintain and enjoy its rights under the terms of this Agreement promptly upon such other Party's written request therefor. All rights, powers and remedies of the non-bankrupt Party as provided herein are in addition to and not in substitution for any and all other rights, powers and remedies now or hereafter existing at law or in equity (including, without limitation, the Bankruptcy Laws) in the event of the commencement of a case by or against a Party under the Bankruptcy Laws.

12.2 Governing Law; Venue. This Agreement shall be governed by and construed in accordance with the laws of the State of New York, excluding its conflicts of laws principles, except as to any issue which depends upon the validity, scope or enforceability of any Patent, which issue shall be determined in accordance with the laws of the country in which such patent was issued. Each Party submits to the exclusive jurisdiction of the state and Federal courts in New York County, New York with respect to any action brought in connection with this Agreement.

12.3 Entire Agreement; Amendments. This Agreement (including the Exhibits and Schedules hereto) is both a final expression of the Parties' agreement and a complete and exclusive statement with respect to all of its terms. This Agreement supersedes all prior and contemporaneous agreements and communications, whether oral, written or otherwise, concerning any and all matters contained herein, including but not limited to the Term Sheet. The Exhibits and Schedules to this Agreement are incorporated herein by reference and shall be deemed a part of this Agreement. This Agreement may be amended, or any term hereof modified, only by a written instrument duly executed by authorized representatives of both Parties hereto.

12.4 Non-Waiver. The failure of a Party to insist upon strict performance of any provision of this Agreement or to exercise any right arising out of this Agreement shall neither impair that provision or right nor constitute a waiver of that provision or right, in whole or in part, in that instance or in any other instance. Any waiver by a Party of a particular provision or right shall be in writing, shall be as to a particular matter and, if applicable, for a particular period of time and shall be signed by such Party.

12.5 Assignment. Except as expressly provided hereunder, neither this Agreement nor any rights or obligations hereunder may be assigned or otherwise transferred by either Party without the prior written consent of the other Party (which consent shall not be unreasonably withheld). Tonix shall have the right to assign, license or otherwise transfer or encumber all or any portion of its rights and/delegate any of its obligations under this Agreement without consent. The rights and obligations of the Parties under this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the Parties, and the name of a Party appearing herein will be deemed to include the name of such Party's successors and permitted assigns to the extent necessary to carry out the intent of this section. Any assignment not in accordance with this Agreement shall be void.

12.6 Force Majeure. Each Party shall be excused from liability for the failure or delay in performance of any obligation under this Agreement by reason of any event beyond such Party's reasonable control, including but not limited to Acts of God, fire, flood, explosion, earthquake, pandemic, epidemic or other natural forces, war, civil unrest, acts of terrorism, accident, destruction or other casualty, any lack or failure of transportation facilities, any lack or failure of supply of raw materials, any strike or labor disturbance, or any other event similar to those enumerated above. Such excuse from liability shall be effective only to the extent and duration of the event(s) causing the failure or delay in performance and provided that the Party has not caused such event(s) to occur. The affected Party shall notify the other Party of such force majeure circumstances as soon as reasonably practical, and shall promptly undertake all reasonable efforts necessary to cure such force majeure circumstances.

12.7 Severability. If any one or more of the provisions contained in this Agreement is held invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby, unless the absence of the invalidated provision(s) adversely affects the substantive rights of the Parties. The Parties shall in such an instance use their best efforts to replace the invalid, illegal or unenforceable provision(s) with valid, legal and enforceable provision(s) which, insofar as practical, implement the purposes of this Agreement.

12.8 Notices. All notices which are required or permitted hereunder shall be in writing and sufficient if delivered personally, sent by facsimile or electronic mail (in each case, if promptly confirmed by personal delivery, registered or certified mail or overnight courier), sent by nationally-recognized overnight courier or sent by registered or certified mail, postage prepaid, return receipt requested, addressed as follows:

If to OyaGen, to:

OyaGen, Inc.
77 Ridgeland Rd.
Rochester, NY 14623
Attn: Dr. Harold C. Smith – CEO

with a copy (which shall not constitute notice to):

FisherBroyles LLP
510 Clinton Square
Rochester, NY 14604
Attn: Andrew K. Gonsalves
E-Mail: andrew.gonsalves@fisherbroyles.com
Facsimile No.: +1 585-486-7083

If to Tonix, to: Tonix Pharmaceuticals, Inc.
26 Main Street
Suite 101
Chatham NJ 07928
Attn: Seth Lederman, MD – Chief Executive Officer

with a copy (which shall not constitute notice to):

Lowenstein Sandler, LLP
One Lowenstein Drive
Roseland, New Jersey 07068
Attn: Michael J. Lerner
E-Mail: mlerner@lowenstein.com
Facsimile No.: +1 973-597-6395

or to such other address(es) as the Party to whom notice is to be given may have furnished to the other Party in writing in accordance herewith. Any such notice shall be deemed to have been given: (a) when delivered, if personally delivered, or if sent by facsimile on a business day (or if delivered or sent on a non-business day, then on the next business day); (b) when delivery is acknowledged if sent by e-mail; (c) on the business day after dispatch, if sent by nationally-recognized overnight courier; or (d) on the third (3rd) business day following the date of mailing, if sent by mail.

12.9 Interpretation. The headings of clauses contained in this Agreement preceding the text of the sections, subsections and paragraphs hereof are inserted solely for convenience and ease of reference only and shall not constitute any part of this Agreement, or have any effect on its interpretation or construction. All references in this Agreement to the singular shall include the plural where applicable. The term "including" or "includes" as used in this Agreement means including, without limiting the generality of any description preceding such term, and the word "or" has the inclusive meaning represented by the phrase "and/or." Unless otherwise specified, references in this Agreement to any section shall include all subsections and paragraphs in such section and references in this Agreement to any subsection shall include all paragraphs in such subsection. All references to days in this Agreement shall mean calendar days, unless otherwise specified. Ambiguities and uncertainties in this Agreement, if any, shall not be interpreted against either Party, irrespective of which Party may be deemed to have caused the ambiguity or uncertainty to exist. This Agreement has been prepared in the English language, and the English language shall control its interpretation. In addition, all notices required or permitted to be given hereunder, and all written, electronic, oral or other communications between the Parties regarding this Agreement shall be in the English language.

12.10 Relationship between the Parties. The Parties' relationship, as established by this Agreement, is solely that of independent contractors. This Agreement does not create any partnership, joint venture or similar business relationship between the Parties. Neither Party is a legal representative of the other Party, and neither Party may assume or create any obligation, representation, warranty or guarantee, express or implied, on behalf of the other Party for any purpose whatsoever.

12.11 Cumulative Remedies. No remedy referred to in this Agreement is intended to be exclusive, but each shall be cumulative and in addition to any other remedy referred to in this Agreement or otherwise available under law.

12.12 No Third Party Rights. The provisions of this Agreement are for the exclusive benefit of the Parties, and no other person or entity shall have any right or claim against any Party by reason of these provisions or be entitled to enforce any of these provisions against any Party.

12.13 Further Assurances. Each Party agrees to do and perform all such further acts and things and will execute and deliver such other agreements, certificates, instruments and documents necessary or that the other Party may deem advisable in order to carry out the intent and accomplish the purposes of this Agreement and to evidence, perfect or otherwise confirm its rights hereunder.

12.14 Compliance with Securities Laws. OyaGen hereby acknowledges that it is aware, and OyaGen shall advise its Affiliates', employees, agents, consultants and other representatives who are informed of the matters that are the subject of the Subscription Agreement, that United States securities laws place certain restrictions on any person who has material, non-public information concerning an issuer, with respect to purchasing or selling securities of such issuer or from communicating such information to any other person when it is reasonably foreseeable that such other person is likely to purchase or sell such securities. OyaGen acknowledges its obligation to comply with all applicable securities laws in connection with the ownership of the Tonix Common Stock and receipt of any Confidential Information of Tonix.

12.15 Costs. Except as specifically provided in this Agreement, each Party shall be solely responsible for all costs, fees and other expenses incurred in connection with this Agreement.

12.16 Counterparts. This Agreement may be executed in counterparts, each of which shall be deemed an original document, and all of which, together with this writing, shall be deemed one instrument. This Agreement may be executed by facsimile or PDF signatures, which signatures shall have the same force and effect as original signatures.

[Remainder of this page intentionally left blank.]

In Witness Whereof, the parties hereto have duly executed this License Agreement as of the Effective Date.

TONIX PHARMACEUTICALS, INC.

By: /s/ Seth Lederman
Name: Seth Lederman
Title: Chief Executive Officer

OYAGEN, INC.

By: /s/ Harold C. Smith
Name: Harold C. Smith
Title: Chief Executive Officer

EXHIBIT A

OYAGEN PATENT PORTFOLIO (AS OF MARCH 23, 2021)

[***]

Exhibit B

THE SHARES REPRESENTED BY THIS CERTIFICATE HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED (THE "SECURITIES ACT"), AND MAY NOT BE SOLD, TRANSFERRED OR ASSIGNED UNLESS REGISTERED UNDER THE SECURITIES ACT OR AN OPINION OF COUNSEL, SATISFACTORY TO THE CORPORATION, IS OBTAINED TO THE EFFECT THAT SUCH SALE, TRANSFER OR ASSIGNMENT IS EXEMPT FROM THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT.

THE SHARES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO ALL THE TERMS OF A SUPPORT AGREEMENT ENTERED INTO AS OF APRIL __, 2020, BY AND AMONG TONIX PHARMACEUTICALS HOLDING CORP. (THE "CORPORATION"), AND THE HOLDER, A COPY OF WHICH AGREEMENT IS ON FILE AT THE PRINCIPAL OFFICE OF THE CORPORATION. SUCH AGREEMENT, AMONG OTHER THINGS, LIMITS THE RIGHT OF THE HOLDER OR ANY TRANSFEREE TO VOTE THE SHARES REPRESENTED HEREBY.

THE SECURITIES REPRESENTED BY THIS CERTIFICATE ARE SUBJECT TO A LOCK-UP PERIOD OF SIX MONTHS AFTER THE CLOSING OF THE LICENSING TRANSACTION, AS SET FORTH IN AN AGREEMENT BETWEEN THE COMPANY AND THE ORIGINAL HOLDER OF THESE SECURITIES, A COPY OF WHICH MAY BE OBTAINED AT THE ISSUER'S PRINCIPAL OFFICE. SUCH LOCK-UP PERIOD IS BINDING ON TRANSFEREES OF THESE SHARES.

EXHIBIT C

VOTING AGREEMENT

SCHEDULE 1.15

DATA ROOM DOCUMENTS LIST

[***]

Schedule 6.4

Publication

[***]

Schedule 7.2(q)

OyaGen

1.	**University of Alberta**	**In vitro Demonstration of Sangivamycin Mechanism of Action Using Recombinant RNA-dependent, RNA polymerases. Investigator is Dr. Matthias Gotte.**

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: May 10, 2021

/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: May 10, 2021

/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 March 31, 2021 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: May 10, 2021

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 March 31, 2021 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: May 10, 2021

Name: Bradley Saenger
Title: *Chief Financial Officer*