UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 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 September 30, 2021

OR

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

For the transition period from _____ to _____

Commission File Number: 001-39536

Taysha Gene Therapies, Inc.

(Exact Name of Registrant as Specified in its Charter)

Delaware	**84-3199512**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
3000 Pegasus Park Drive Ste 1430 Dallas, Texas	**75247**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (214) 612-0000

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, par value $0.00001 per share	TSHA	The Nasdaq Stock Market LLC

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, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

As of November 10, 2021, the registrant had 38,473,945 shares of common stock, $0.00001 par value per share, outstanding.

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PART I—FINANCIAL INFORMATION

Item 1. Financial Statements.

Taysha Gene Therapies, Inc.
Condensed Consolidated Balance Sheets
(in thousands, except share and per share data)
(Unaudited)

	September 30, 2021	December 31, 2020
ASSETS		
Current assets:		
Cash and cash equivalents	$ 188,785	$ 251,253
Prepaid expenses and other current assets	8,385	6,626
Total current assets	197,170	257,879
Restricted cash	2,628	—
Deferred lease asset	691	715
Property, plant and equipment, net	40,553	287
Total assets	**$ 241,042**	**$ 258,881**
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 22,051	$ 1,994
Accrued expenses and other current liabilities	21,163	5,135
Total current liabilities	43,214	7,129
Build-to-suit lease liability	26,607	—
Term loan	27,812	—
Other non-current liabilities	3,015	450
Total liabilities	100,648	7,579
Commitments and contingencies - Note 11		
Stockholders' equity		
Preferred stock, $0.00001 par value per share; 10,000,000 shares authorized and no shares issued and outstanding as of September 30, 2021 and December 31, 2020	—	—
Common stock, $0.00001 par value per share; 200,000,000 shares authorized and 38,473,945 and 37,761,435 issued and outstanding as of September 30, 2021 and December 31, 2020	—	—
Additional paid-in capital	325,657	312,428
Accumulated deficit	(185,263)	(61,126)
Total stockholders’ equity	140,394	251,302
Total liabilities and stockholders' equity	**$ 241,042**	**$ 258,881**

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

Taysha Gene Therapies, Inc.
Condensed Consolidated Statements of Operations
(in thousands, except share and per share data)
(Unaudited)

	For the Three Months Ended September 30,		For the Nine Months Ended September 30,	
	2021	2020	2021	2020
Operating expenses:				
Research and development	$ 39,528	$ 11,057	$ 94,025	$ 19,633
General and administrative	11,153	3,984	29,518	5,002
Total operating expenses	50,681	15,041	123,543	24,635
Loss from operations	(50,681)	(15,041)	(123,543)	(24,635)
Other income (expense):				
Change in fair value of preferred stock tranche liability	—	—	—	(17,030)
Interest income	37	—	143	—
Interest expense	(543)	(1)	(737)	(28)
Total other expense, net	(506)	(1)	(594)	(17,058)
Net loss	**$ (51,187)**	**$ (15,042)**	**$ (124,137)**	**$ (41,693)**
Net loss per common share, basic and diluted	$ (1.35)	$ (1.28)	$ (3.31)	$ (3.73)
Weighted average common shares outstanding, basic and diluted	38,003,954	11,733,170	37,495,537	11,176,429

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

Taysha Gene Therapies, Inc.
Condensed Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(in thousands, except share data)
(Unaudited)

For the Three Months Ended September 30, 2021

	Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount			
Balance as of June 30, 2021	**38,391,165**	**$ —**	**$ 320,571**	**$ (134,076)**	**$ 186,495**
Stock-based compensation	—	—	5,086	—	5,086
Issuance of common stock, upon vesting and settlement of restricted stock units	82,780	—	—	—	—
Net loss	—	—	—	(51,187)	(51,187)
Balance as of September 30, 2021	**38,473,945**	**$ —**	**$ 325,657**	**$ (185,263)**	**$ 140,394**

For the Three Months Ended September 30, 2020

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Equity (Deficit)
	Shares	Amount	Shares	Amount	Shares	Amount			
Balance as of June 30, 2020	**6,200,000**	**$ 18,014**	**—**	**$ —**	**10,894,999**	**$ —**	**$ 980**	**$ (27,766)**	**$ (26,786)**
Issuance of Series A convertible preferred stock, net of offering costs of $165	3,800,000	11,235	—	—	—	—	—	—	—
Issuance of Series B convertible preferred stock net of offering costs of $185	—	—	5,647,048	95,815	—	—	—	—	—
Reclassification of preferred stock tranche liability upon issuance of Series A milestone shares	—	17,176	—	—	—	—	—	—	—
Conversion of Series A and B convertible preferred stock to common stock	(10,000,000)	(46,425)	(5,647,048)	(95,815)	17,047,378	—	142,240	—	142,240
Issuance of shares of common stock in initial public offering, net of offering costs and underwriting discounts and commissions of $15,111	—	—	—	—	9,050,000	—	165,889	—	165,889
Issuance of restricted stock award	—	—	—	—	769,058	—	—	—	—
Stock-based compensation	—	—	—	—	—	—	1,341	—	1,341
Net loss	—	—	—	—	—	—	—	(15,042)	(15,042)
Balance as of September 30, 2020	**—**	**$ —**	**—**	**$ —**	**37,761,435**	**$ —**	**$ 310,450**	**$ (42,808)**	**$ 267,642**

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

Taysha Gene Therapies, Inc.
Condensed Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity (Deficit)
(in thousands, except share data)
(Unaudited)

For the Nine Months Ended September 30, 2021

	Common Stock		Additional Paid-in	Accumulated	Total Stockholders'
	Shares	Amount	Capital	Deficit	Equity
Balance as of December 31, 2020	**37,761,435**	**$ —**	**$ 312,428**	**$ (61,126)**	**$ 251,302**
Stock-based compensation	—	—	13,229	—	13,229
Issuance of common stock, upon vesting and settlement of restricted stock units	712,510	—	—	—	—
Net loss	—	—	—	(124,137)	(124,137)
Balance as of September 30, 2021	**38,473,945**	**$ —**	**$ 325,657**	**$ (185,263)**	**$ 140,394**

For the Nine Months Ended September 30, 2020

	Series A Convertible Preferred Stock		Series B Convertible Preferred Stock		Common Stock		Additional Paid-in	Accumulated	Total Stockholders' Equity
	Shares	Amount	Shares	Amount	Shares	Amount	Capital	Deficit	(Deficit)
Balance as of December 31, 2019	**—**	**—**	**—**	**—**	**10,894,999**	**—**	**980**	**(1,115)**	**(135)**
Issuance of Series A convertible preferred stock, net of offering costs of $605 and issuance of preferred stock tranche liability of $1,050	10,000,000	28,345	—	—	—	—	—	—	—
Issuance of Series B convertible preferred stock net of offering costs of $185	—	—	5,647,048	95,815	—	—	—	—	—
Reclassification of preferred stock tranche liability upon issuance of Series A milestone shares	—	18,080	—	—	—	—	—	—	—
Conversion of Series A and Series B convertible preferred stock to common stock	(10,000,000)	(46,425)	(5,647,048)	(95,815)	17,047,378	—	142,240	—	142,240
Issuance of shares of common stock in initial public offering, net of offering costs and underwriting discounts and commissions of $15,111	—	—	—	—	9,050,000	—	165,889	—	165,889
Issuance of restricted stock award	—	—	—	—	769,058	—	—	—	—
Stock-based compensation	—	—	—	—	—	—	1,341	—	1,341
Net loss	—	—	—	—	—	—	—	(41,693)	(41,693)
Balance as of September 30, 2020	**—**	**$ —**	**—**	**$ —**	**37,761,435**	**$ —**	**$ 310,450**	**$ (42,808)**	**$ 267,642**

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

Taysha Gene Therapies, Inc.
Condensed Consolidated Statements of Cash Flows
(in thousands)
(Unaudited)

	For the Nine Months Ended September 30, 2021	2020
Cash flows from operating activities		
Net loss	$ (124,137)	$ (41,693)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation expense	283	3
Change in fair value of preferred stock tranche liability	—	17,030
Research and development license expense	6,750	6,000
Stock-based compensation	13,229	1,341
Build-to-suit lease	357	—
Other	93	—
Changes in operating assets and liabilities:		
Prepaid expenses and other assets	(1,530)	(604)
Accounts payable	16,000	5,403
Accrued expenses and other liabilities	12,179	1,579
Due to related party	(8)	60
Net cash used in operating activities	(76,784)	(10,881)
Cash flows from investing activities		
Purchase of research and development license	(6,000)	(3,000)
Purchase of property, plant and equipment	(7,034)	(31)
Net cash used in investing activities	(13,034)	(3,031)
Cash flows from financing activities		
Proceeds from Term Loan, net	29,978	—
Proceeds from initial public offering, net of underwriting discounts and commission and other offering costs	—	167,162
Proceeds from Series A convertible preferred stock, net of issuance costs	—	29,569
Proceeds from Series B convertible preferred stock, net of issuance costs	—	95,815
Proceeds from note payable to related party	—	1,673
Repayment of note payable to related party	—	(1,673)
Net cash provided by financing activities	29,978	292,546
Net (decrease) increase in cash, cash equivalents and restricted cash	(59,840)	278,634
Cash, cash equivalents and restricted cash at the beginning of the period	**251,253**	**—**
Cash, cash equivalents and restricted cash at the end of the period	**$ 191,413**	**$ 278,634**
Cash and cash equivalents	188,785	278,634
Restricted cash	2,628	—
Cash, cash equivalents and restricted cash at the end of the period	**$ 191,413**	**$ 278,634**
Supplemental disclosure of cash flow information:		
Cash paid for interest	$ 110	$ 28
Supplemental disclosure of noncash investing and financing activities:		
Property, plant and equipment in accounts payable and accrued expenses	$ 6,658	$ —
Acquisition of property, plant and equipment funded by landlord	$ 606	$ —
Build-to-suit lease liability	$ 26,607	$ —
Deferred offering costs not yet paid	$ 204	$ —
Reclassification of preferred stock tranche liability	$ —	$ 18,080
Allocation of preferred stock tranche liability	$ —	$ 1,050
Conversion of Series A and Series B convertible preferred stock to common stock	$ —	$ 142,240
Purchase of research and development license not yet paid	$ 750	$ 3,000
Issuance costs for issuance of common stock in initial public offering not yet paid	$ —	$ 1,273
Series A convertible preferred stock issuance costs not yet paid	$ —	$ 174

Note 1—Organization and Description of Business Operations

Taysha Gene Therapies, Inc. (the "Company" or "Taysha") was originally formed under the laws of the State of Texas on September 20, 2019 ("Inception"). Taysha converted to a Delaware corporation on February 13, 2020, which had no impact to the Company's par value or issued and authorized capital structure.

Taysha is a patient-centric gene therapy company focused on developing and commercializing AAV-based gene therapies for the treatment of monogenic diseases of the central nervous system in both rare and large patient populations.

Stock Split

On September 16, 2020, the Company effected a 1.0895-for-one stock split of its authorized, issued and outstanding shares of common stock and a proportional adjustment to the existing conversion ratios for each series of the Company's convertible preferred stock as discussed in Note 6. Accordingly, all share and per share amounts for the periods presented in the accompanying condensed consolidated financial statements and notes thereto have been adjusted retroactively, where applicable, to reflect this stock split and adjustment of the convertible preferred stock conversion ratios. On September 16, 2020, the Company also increased the number of shares of common stock authorized for issuance under the 2020 Equity Incentive Plan (the "Existing Plan") to 3,845,294.

Initial Public Offering

On September 23, 2020, the Company's registration statement on Form S-1 (File No. 333-248559) related to the initial public offering ("IPO") of its common stock became effective and on September 28, 2020, the IPO closed. Pursuant to the IPO, the Company issued and sold 9,050,000 shares of common stock at a public offering price of $20.00 per share, which included 1,180,434 shares of common stock issued upon the exercise in full of the underwriters' option to purchase additional shares. The Company received net proceeds of $165.9 million after deducting underwriting discounts and commissions and other offering costs of $2.5 million. The shares began trading on the Nasdaq Global Select Market on September 24, 2020.

On September 28, 2020, in connection with the closing of the IPO, 10,000,000 shares of Series A and 5,647,048 shares of Series B convertible preferred stock automatically converted into an aggregate of 17,047,378 shares of common stock with a conversion ratio of 1.0895 shares of common stock for each share of Series A and Series B convertible preferred stock.

As a result of the IPO, including the underwriters' exercise in full of their option to purchase additional shares, and the conversions of the Series A and B convertible preferred stock, the Company's total number of outstanding shares increased by 26,097,378 immediately following the closing of the IPO.

Upon the effectiveness of the Company's registration statement related to the IPO, the Company's 2020 Stock Incentive Plan (the "New Plan") and 2020 Employee Stock Purchase Plan became effective. At that time, all shares reserved for issuance under the Existing Plan ceased to be available for issuance under such plan and became available for issuance under the New Plan.

Liquidity and Capital Resources

The Company has incurred operating losses since inception and expects to continue to incur significant operating losses for the foreseeable future and may never become profitable. As of September 30, 2021, the Company had an accumulated deficit of $185.3 million.

Prior to the closing of the Company's IPO, between March and July 2020, the Company closed on the sale of an aggregate of 10,000,000 shares of Series A convertible preferred stock for gross proceeds of $30.0 million. Between July and August 2020, the Company closed on the sale of an aggregate of 5,647,048 shares of Series B convertible preferred stock for gross proceeds of $96.0 million.

Future capital requirements will depend on many factors, including the timing and extent of spending on research and development and the market acceptance of the Company's products. The Company will need to obtain additional financing in order to complete clinical studies and launch and commercialize any product candidates for which it receives regulatory approval. There can be no assurance that such financing will be available or will be on terms acceptable to the Company. As of September 30, 2021, the Company had cash and cash equivalents of $188.8 million which the Company believes will be sufficient to fund its planned operations for a period of at least twelve months from the date of issuance of these condensed consolidated financial statements.

In December 2019, the novel coronavirus that causes the disease COVID-19 emerged and has subsequently spread worldwide. The World Health Organization has declared the COVID-19 outbreak a global pandemic, resulting in federal, state and

local governments and private entities implementing various restrictions including travel restrictions, restrictions on public gatherings, stay at home orders, other advisories and quarantines of people who may have been exposed to the virus. The Company has been actively monitoring COVID-19 and its impact globally. Management believes the financial results for the nine months ended September 30, 2021 were not significantly impacted by the COVID-19 pandemic. In addition, management believes the remote working arrangements and travel restrictions imposed by various governmental jurisdictions have had limited impact on the Company's ability to maintain internal operations during the nine months ended September 30, 2021. The full extent to which the COVID-19 pandemic will directly or indirectly impact the Company's business, results of operations and financial condition will depend on future developments that are highly uncertain, including new information that may emerge concerning COVID-19 and the actions taken to contain it or treat COVID-19.

Note 2—Summary of Significant Accounting Policies

Basis of Presentation

The unaudited condensed consolidated financial statements have been prepared in conformity with accounting principles generally accepted in the United States ("GAAP") as determined by the Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") for interim financial information and the instructions to Form 10-Q and Article 10 of Regulation S-X and are consistent in all material respects with those included in the Company's Annual Report on Form 10-K for the year ended December 31, 2020, filed with the Securities and Exchange Commission ("SEC") on March 3, 2021 (the "2020 Annual Report"). In the opinion of management, the unaudited condensed consolidated financial statements reflect all adjustments, which include only normal recurring adjustments necessary for the fair statement of the balances and results for the periods presented. The consolidated balance sheet as of December 31, 2020 is derived from audited financial statements, however, it does not include all of the information and footnotes required by GAAP for complete financial statements. These unaudited condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and related notes in the Company's 2020 Annual Report on Form 10-K for the year ended December 31, 2020, filed with the SEC on March 3, 2021.

Principles of Consolidation

The accompanying interim condensed consolidated financial statements include the accounts of Taysha and its inactive wholly owned U.S. subsidiaries that were incorporated during 2020, and two inactive foreign subsidiaries incorporated during 2021. All intercompany transactions and balances have been eliminated in consolidation.

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting period. The most significant estimates and assumptions in the Company's financial statements relate to the determination of the fair value of the common stock prior to the IPO (as an input into stock-based compensation), estimating preclinical manufacturing accruals and accrued or prepaid research and development expenses, and the valuation of the preferred stock tranche liability. These estimates and assumptions are based on current facts, historical experience and various other factors believed to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities and the recording of expenses that are not readily apparent from other sources. Actual results may differ materially from these estimates. To the extent there are material differences between the estimates and actual results, the Company's future results of operations will be affected. In response to the ongoing and rapidly evolving COVID-19 pandemic, management considered the impact of the estimated economic implications on the Company's critical and significant accounting estimates, including assessment of impairment of long-lived assets.

Significant Accounting Policies

There have been no changes in the Company's significant accounting policies as disclosed in Note 2 to the audited consolidated financial statements included in the 2020 Annual Report, except as described below:

Restricted Cash

Restricted cash consists of cash that the Company has placed in an escrow account which is pledged as collateral under certain lease agreements and letters of credit.

Offering Costs

The Company capitalizes costs directly associated with equity financings until such financings are consummated, at which time such costs are recorded in additional paid-in capital against the gross proceeds of the equity financings. Costs associated with the shelf registration statement on Form S-3, filed with the SEC on October 5, 2021 have been capitalized and will be reclassified to additional paid-in capital on a pro rata basis when the Company completes offerings under the shelf registration. At the end of the three-year term of the shelf registration, the remaining deferred offering costs, if any, will be charged to operations. As of September 30, 2021, $0.2 million of such deferred costs are included in prepaid expenses and other current assets on the condensed consolidated balance sheet.

Build-to-Suit Lease

In the Company's recent lease arrangement (as described in Note 11), the Company was involved in the construction of the build-out. To the extent the Company is involved with the structural improvements of the construction project or takes construction risk prior to the commencement of a lease, accounting guidance requires the Company to be considered the owner for accounting purposes of these types of projects during the construction period. In such cases, the Company records an asset in property, plant and equipment on its consolidated balance sheet equal to the fair value of the building shell, and a corresponding build-to-suit lease obligation on its consolidated balance sheet representing the amounts paid by the lessor. Upon completion of construction, the Company will consider the requirements for sale-leaseback accounting treatment, including evaluating whether all risks of ownership have been transferred back to the landlord.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842), as amended, with guidance regarding the accounting for and disclosure of leases. This update requires lessees to recognize the liabilities related to all leases, including operating leases, with a term greater than 12 months on the balance sheets. This update also requires lessees and lessors to disclose key information about their leasing transactions. This guidance will become effective for the Company for annual reporting periods beginning after December 15, 2021 and interim periods within fiscal years beginning after December 15, 2022. The new standard requires the use of one of the following two approaches, either (1) retrospectively to each prior reporting period presented in the financial statements with the cumulative effect recognized at the beginning of the earliest comparative period presented, or (2) retrospectively at the beginning of the period of adoption through a cumulative-effect adjustment. The Company has not yet concluded which approach will be utilized to adopt the new standard and is currently evaluating the impact of this standard on its condensed consolidated financial statements.

Note 3—Balance Sheet Components

Prepaid expenses and other current assets consisted of the following (in thousands):

	September 30, 2021	December 31, 2020
Prepaid research and development	$ 5,500	$ 2,462
Prepaid bonus	800	409
Prepaid clinical trial	779	944
Prepaid insurance	144	2,480
Other	1,162	331
Total prepaid expenses and other current assets	$ 8,385	$ 6,626

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

	September 30, 2021	December 31, 2020
Leasehold improvements	$ 1,876	$ —
Furniture and fixtures	759	—
Computer equipment	818	95
Laboratory equipment	476	—
Construction in progress	36,916	201
	40,845	296
Accumulated depreciation	(292)	(9)
Property, plant and equipment, net	$ 40,553	$ 287

Included in construction in progress at September 30, 2021 was $36.7 million of costs associated with the Build-to-Suit lease (see Note 11).

Depreciation expense was $166,000 and $283,000 for the three and nine months ended September 30, 2021, respectively. Depreciation expense was not significant for the three and nine months ended September 30, 2020.

Accrued expenses and other current liabilities consisted of the following (in thousands):

	September 30, 2021	December 31, 2020
Accrued research and development	$ 9,330	$ 2,106
Accrued compensation	5,752	1,766
Accrued professional and consulting fees	1,386	999
Accrued property, plant, and equipment	2,774	173
Accrued clinical trial	1,142	—
Other	779	91
Total accrued expenses and other current liabilities	$ 21,163	$ 5,135

Note 4—Loan with Silicon Valley Bank

On August 12, 2021 (the "Closing Date"), the Company entered into a Loan and Security Agreement (the "Term Loan Agreement"), by and among the Company, the lenders party thereto from time to time (the "Lenders") and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders ("Agent"). The Term Loan Agreement provides for (i) on the Closing Date, $40.0 million aggregate principal amount of term loans available through December 31, 2021, (ii) from January 1, 2022 until September 30, 2022, an additional $20.0 million term loan facility available at the Company's option upon having three distinct and active clinical stage programs at the time of draw, (iii) from October 1, 2022 until March 31, 2023, an additional $20.0 million term loan facility available at the Company's option upon having three distinct and active clinical stage programs at the time of draw and (iv) from April 1, 2023 until December 31, 2023, an additional $20.0 million term loan facility available upon approval by the Agent and the Lenders (collectively, the "Term Loans"). The Company drew $30.0 million in term loans on the Closing Date.

The interest rate applicable to the Term Loans is the greater of (a) the WSJ Prime Rate plus 3.75% or (b) 7.00% per annum. The Term Loans are interest only from the Closing Date through August 31, 2024, after which the Company is required to pay equal monthly installments of principal through August 1, 2026, the maturity date.

The Term Loans may be prepaid in full through August 12, 2022 with payment of a 2.00% prepayment premium, after which they may be prepaid in full through August 12, 2023 with payment of a 1.00% prepayment premium, after which they may be prepaid in full with no prepayment premium. An additional final payment of 7.5% of the amount of Terms Loans advanced by the Lenders ("Exit Fee') will be due upon prepayment or repayment of the Term Loans in full. The Exit Fee of $2.3 million was recorded as debt discount and has also been fully accrued within non-current liabilities as of September 30, 2021. The debt discount is being accreted using the effective interest method over the term of the Term Loans within interest expense in the condensed statements of operations.

The obligations under the Term Loan Agreement are secured by a perfected security interest in all of the Company's assets except for intellectual property and certain other customarily excluded property pursuant to the terms of the Term Loan Agreement.

There are no financial covenants and no warrants associated with the Term Loan Agreement. The Term Loan Agreement contains various covenants that limit the Company's ability to engage in specified types of transactions without the consent of the Lenders which include, among others, incurring or assuming certain debt; merging, consolidating or acquiring all or substantially all of the capital stock or property of another entity; changing the nature of the Company's business; changing the Company's organizational structure or type; licensing, transferring or disposing of certain assets; granting certain types of liens on the Company's assets; making certain investments; and paying cash dividends.

The Term Loan Agreement also contains customary representations and warranties, and also includes customary events of default, including payment default, breach of covenants, change of control, and material adverse effects. The Company was in compliance with all covenants under the Term Loan Agreement as of September 30, 2021. Upon the occurrence of an event of default, a default interest rate of an addition 5% per annum may be applied to the outstanding loan balances, and the Lenders may declare all outstanding obligations immediately due and payable and exercise all of its rights and remedies as set forth in the Term Loan Agreement and under applicable law.

Future principal debt payments on the loan payable as of September 30, 2021 are as follows (in thousands):

Year Ending December 31,		
2021	$	—
2022		—
2023		—
2024		5,000
2025		15,000
2026		10,000
Total principal payments		30,000
Less: Unamortized debt discount		(2,188)
Term loan, net	$	27,812

Note 5—Research, Collaboration and License Agreements

UT Southwestern Agreement

On November 19, 2019, the Company entered into a research, collaboration and license agreement ("UT Southwestern Agreement") with the Board of Regents of the University of Texas System on behalf of The University of Texas Southwestern Medical Center ("UT Southwestern"). Under the UT Southwestern Agreement, UT Southwestern is primarily responsible for preclinical development activities with respect to licensed products for use in certain specified indications (up to investigational new drug application-enabling studies), and the Company is responsible for all subsequent clinical development and commercialization activities with respect to the licensed products. UT Southwestern will conduct such preclinical activities for a two-year period under mutually agreed upon sponsored research agreements that were entered into beginning in April 2020. During the initial research phase, the Company has the right to expand the scope of specified indications under the UT Southwestern Agreement.

In connection with the UT Southwestern Agreement, the Company obtained an exclusive, worldwide, royalty-free license under certain patent rights of UT Southwestern and a non-exclusive, worldwide, royalty-free license under certain know-how of UT Southwestern, in each case to make, have made, use, sell, offer for sale and import licensed products for use in certain specified indications. Additionally, the Company obtained a non-exclusive, worldwide, royalty-free license under certain patents and know-how of UT Southwestern for use in all human uses, with a right of first refusal to obtain an exclusive license under certain of such patent rights and an option to negotiate an exclusive license under other of such patent rights. The Company is required to use commercially reasonable efforts to develop, obtain regulatory approval for, and commercialize at least one licensed product.

On April 2, 2020, the Company amended the UT Southwestern Agreement to include the addition of another licensed product and certain indications, and a right of first refusal to the Company over certain patient dosing patents. No additional consideration was transferred in connection with this amendment.

The UT Southwestern Agreement expires on a country-by-country and licensed product-by-licensed product basis upon the expiration of the last valid claim of a licensed patent in such country for such licensed product. After the initial research term, the Company may terminate the agreement, on an indication-by-indication and licensed product-by-licensed product basis, at any time upon specified written notice to UT Southwestern. Either party may terminate the agreement upon an uncured material breach of the agreement or insolvency of the other party.

In November 2019, as partial consideration for the license rights granted under the UT Southwestern Agreement, the Company issued 2,179,000 shares of its common stock, or 20% of its then outstanding fully-diluted common stock, to UT Southwestern. As additional consideration, UT Southwestern was entitled to receive additional shares if their holdings fell below 10% on a fully-diluted basis before or as a result of the completion of a qualified financing. In March 2020, following the initial closing of the Series A convertible preferred stock agreement, which met the definition of such qualified financing, the anti-dilution feature expired and no additional shares were issued. The Company does not have any future milestone or royalty obligations to UT Southwestern under the UT Southwestern Agreement other than costs related to maintenance of patents.

Queen's Agreement

In late December 2019, the Company entered into a research grant agreement ("RGA") with Queen's University at Kingston ("Queen's"), for certain research and development activities related to the generation of AAV9 vector. The Company committed to fund $3.8 million under the RGA with Queen's. The Company issued Queen's a promise-to-pay note whereby any amounts paid directly by Queen's for the manufacture of the vector for use in the funded research activities, to the extent such amounts had not already been funded by the Company to Queen's, would become a loan obligation for the Company (the "Note"), subject to an interest rate of 6%. Any amounts outstanding under the Note were required to be repaid, along with any accrued interest, by or before June 30, 2020. In the event of default, any amount outstanding was deemed immediately payable by RA Session II, the Company's President and Chief Executive Officer, as a personal guarantor (see Note 9). For the period from Inception through December 31, 2019, the Company did not incur any expenses associated with the Queen's RGA, and no amounts were due or outstanding under the Note as of December 31, 2019. For the year ended December 31, 2020, the Company paid all expenses associated with the Queen's RGA, thus no amounts were due or outstanding under the Note as of December 31, 2020, and the promise-to-pay has therefore expired.

On February 21, 2020, the Company entered into a license agreement with Queen's (the "Queen's Agreement") to obtain the exclusive perpetual, royalty-bearing license, with the right to sublicense through multiple tiers, under certain patent rights and know-how of Queen's, including certain improvements to such patent rights and know-how, to develop products in any field which use one or more valid claims of the patents licensed under the Queen's Agreement (the "Licensed Patents"), or the technology, information and intellectual property related to the patents licensed under the Queen's Agreement (together with the Licensed Patents, the "Licensed Products"), and to make, have made, use, sell, offer for sale, import and export Licensed Products and otherwise exploit such patents and know-how for use in certain specified indications. In exchange for the rights granted to the Company, the Company made a cash payment of $3.0 million in April 2020 which is recorded in research and development expenses in the condensed consolidated statements of operations and included as an investing cash outflow in the condensed consolidated statements of cash flows since the acquired license does not have an alternative future use for the nine months ended September 30, 2020. The Company is obligated to make aggregate cash payments of up to $10.0 million upon the completion of a combination of regulatory milestones and up to $10.0 million upon the completion of a combination of commercial milestones. In further consideration of the rights granted, beginning with the Company's first commercial sale of the Licensed Products, the Company will also pay an annual earned royalty in the low single digits on net sales of Licensed Products, subject to certain customary reductions, and a percentage of non-royalty sublicensing revenue ranging in the low double digits. Royalties are payable, on a Licensed Products-by-Licensed Products and a country-by-country basis, until expiration of the last valid claim of a Licensed Patent covering such Licensed Products in such country and the expiration of any regulatory exclusivity for such Licensed Products in such country.

No additional milestone payments were made in connection with the Queen's Agreement during the nine months ended September 30, 2021.

Abeona CLN1 Agreements

In August 2020, the Company entered into license and inventory purchase agreements with Abeona Therapeutics Inc. ("Abeona") for worldwide exclusive rights to certain intellectual property rights and know-how relating to the research, development and manufacture of ABO-202, an AAV-based gene therapy for CLN1 disease (also known as infantile Batten disease). Under the terms of the agreements, the Company made initial cash payments to Abeona of $3.0 million for the license fee and $4.0 million for purchase of clinical materials and reimbursement for previously incurred development costs in October 2020. In exchange for the license rights, the Company recorded an aggregate of $7.0 million within research and development expenses in the consolidated statements of operations for the year ended December 31, 2020 since the acquired license or acquired inventory do not have an alternative future use. The Company is obligated to make up to $26.0 million in regulatory-related milestones and up to $30.0 million in sales-related milestones per licensed CLN1 product. The Company will also pay an annual earned royalty in the high single digits on net sales of any licensed CLN1 products. The license agreement expires on a country-by-country and licensed product-by-licensed product basis upon the expiration of the last royalty term of a licensed product. Either party may terminate the agreement upon an uncured material breach of the agreement or insolvency of the other party. The Company may terminate the license agreement for convenience upon specified prior written notice to Abeona.

No additional milestone payments were made in connection with this agreement during the nine months ended September 30, 2021.

Abeona Rett Agreement

On October 29, 2020, the Company entered into a license agreement (the "Abeona Rett Agreement") with Abeona pursuant to which the Company obtained an exclusive, worldwide, royalty-bearing license, with the right to grant sublicenses under certain patents, know-how and materials originally developed by the University of North Carolina at Chapel Hill, the University of Edinburgh and Abeona to research, develop, manufacture, have manufactured, use, and commercialize licensed products for gene therapy and the use of related transgenes for Rett syndrome.

Subject to certain obligations of Abeona, the Company is required to use commercially reasonable efforts to develop at least one licensed product and commercialize at least one licensed product in the United States.

In connection with the Abeona Rett Agreement, the Company paid Abeona a one-time upfront license fee of $3.0 million which is recorded in research and development expenses in the consolidated statements of operations for the year ended December 31, 2020 since the acquired license does not have an alternative future use. The Company is obligated to pay Abeona up to $26.5 million in regulatory-related milestones and up to $30.0 million in sales-related milestones per licensed Rett product and high single-digit royalties on net sales of licensed Rett products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the latest of the expiration or revocation or complete rejection of the last licensed patent covering such licensed product in the country where the licensed product is sold, the loss of market exclusivity in such country where the product is sold, or, if no licensed product exists in such country and no market exclusivity exists in such country, ten years from first commercial sale of such licensed product in such country.

The Abeona Rett Agreement expires on a country-by-country and licensed product-by-licensed product basis upon the expiration of the last royalty term of a licensed product. Either party may terminate the agreement upon an uncured material breach of the agreement or insolvency of the other party. The Company may terminate the agreement for convenience upon specified prior written notice to Abeona.

No additional milestone payments were made in connection with the Abeona Rett Agreement during the nine months ended September 30, 2021.

Acquisition of Worldwide Rights for TSHA-120 for the treatment of GAN

In March 2021, the Company acquired the exclusive worldwide rights to a clinical-stage AAV9 gene therapy program, now known as TSHA-120, for the treatment of Giant Axonal Neuropathy ("GAN"). TSHA-120 is an intrathecally dosed AAV9 gene therapy currently being evaluated in a clinical trial for the treatment of GAN. The trial is being conducted by the National Institutes of Health in close collaboration with a leading patient advocacy group focused on finding treatments and cures for GAN. TSHA-120 has received rare pediatric disease and orphan drug designations from the U.S. Food and Drug Administration for the treatment of GAN. The worldwide rights were acquired through a license agreement, effective March 29, 2021, between Hannah's Hope Fund for Giant Axonal Neuropathy, Inc. ("HHF") and the Company.

Under the terms of the agreement, in exchange for granting the Company the exclusive worldwide rights to TSHA-120, HHF received an upfront payment of $5.5 million and will be eligible to receive clinical, regulatory and commercial milestones totaling up to $19.3 million, as well as a low, single-digit royalty on net sales upon commercialization of the product.

In exchange for the license rights, the Company recorded an aggregate of $5.5 million within research and development expenses in the condensed consolidated statements of operations since the acquired license does not have an alternative future use. This license fee was paid in April 2021 and has been classified as an investing outflow in the condensed consolidated statements of cash flows for the nine months ended September 30, 2021. No additional milestone payments were made in connection with this agreement during the nine months ended September 30, 2021.

Note 6—Stockholders' Equity (Deficit), Convertible Preferred Stock and Tranche Liability

Authorized Shares

The Company amended its certificate of incorporation on March 4, 2020, July 2, 2020 and again on July 28, 2020 such that the total number of shares of common stock authorized to be issued was increased to 32,685,000, and the total number of shares of preferred stock authorized to be issued was increased to 15,647,052, of which 10,000,000 preferred shares were designated Series A convertible preferred stock and 5,647,052 were designated Series B convertible preferred stock. On September 28, 2020, the Company amended its certificate of incorporation such that the total number of shares of common stock authorized to be issued was increased to 200,000,000, and the total number of shares of new preferred stock authorized to be issued was 10,000,000. As of September 30, 2021 and December 31, 2020, no shares of preferred stock were issued or outstanding.

IPO

On September 28, 2020, the Company issued an aggregate of 7,869,566 shares of common stock in the IPO, and on September 29, 2020, the Company issued an aggregate of 1,180,434 shares of common stock upon the underwriters' exercise in full of their option to purchase additional shares, each at the public offering price of $20.00 per share less underwriting discounts and commissions. In connection with the IPO, the Company received gross proceeds of $181.0 million, which was offset by issuance costs, including underwriters' discounts and commissions, of approximately $15.1 million.

Series A and B convertible preferred stock

On March 4, 2020, the Company entered into a purchase agreement (the "Series A Purchase Agreement") providing for a private placement of up to 10,000,000 shares of Series A convertible preferred stock at an original issuance price of $3.00 per share, subject to separate closings, including: (1) 6,000,000 shares at the initial closing on March 4, 2020, and (2) 2,000,000 shares at each of two subsequent closings triggered by the achievement of specific clinical milestones. The Series A Purchase Agreement obligated the Company to issue and sell and the Series A investors to purchase up to a total of 4,000,000 additional shares of Series A convertible preferred stock (the "Milestone Shares") at the same price per share upon the achievement of certain defined clinical milestones (the "tranche liability"). The determination as to whether the milestone events had been met was subject to certification by the Board of Directors. Each Series A investor had the right, but not the obligation, to purchase all or any portion of the Milestone Shares at any time in its sole option and in its sole and absolute discretion, whether or not the Company had achieved the applicable clinical milestone.

On June 30, 2020, several affiliated Series A investors elected to exercise in full their options to purchase 200,000 shares, representing all of their remaining pro-rata portion of the Milestone Shares, prior to the Company's achievement of the clinical milestones for gross proceeds of $0.6 million. The remainder of the Series A investors exercised in full their options to purchase 3,800,000 shares, representing all of their remaining pro-rata portion of the Milestone Shares, prior to the Company's achievement of the clinical milestones, for gross proceeds of $11.4 million between July 1, 2020 and July 2, 2020. As part of this issuance, the Company issued and sold 3,266,667 shares to PBM TGT Holdings, LLC and 400,000 shares to Nolan Capital, LLC, which stockholders are controlled by certain members of the Company's board of directors.

On July 2, 2020, the Company entered into a purchase agreement (the "Series B Purchase Agreement"), as later amended on July 28, 2020, providing for a private placement of up to 5,647,052 shares of Series B convertible preferred stock. The Company sold 5,647,048 shares of Series B convertible preferred stock at a price of $17.00 per share in multiple closings in July and August 2020 for gross proceeds of $96.0 million. The majority of investors that participated in the Series B Purchase Agreement were new investors.

As described above, in connection with the closing of the IPO, all shares of Series A and Series B convertible preferred stock were automatically converted into an aggregate of 17,047,378 shares of common stock with a conversion ratio, which was adjusted for the stock split, of 1.0895 shares of common stock for each share of Series A and Series B convertible preferred stock then outstanding.

Series A convertible preferred stock tranche liability

The Company concluded that the tranche liability met the definition of a freestanding financial instrument, as it was legally detachable and separately exercisable from the initial closing of the Series A convertible preferred stock. The estimated fair value of the tranche liability was determined using a Monte Carlo simulation at the initial issuance date. As of March 4, 2020, the simulations occurred based on the implied aggregate equity value of the Company derived from the Series A convertible preferred stock offering price of $3.00 per share, along with, in part, the following subjective assumptions: risk-free rate of 0.59%, an expected volatility of 80%, the expected term to a liquidity event of 1 year, and a 60% probability of achieving the clinical milestones and timing thereof. Subsequently, the estimated fair value of the tranche liability was determined using a backsolve approach at June 30, 2020, immediately prior to the issuance of the Milestone Shares, which was calculated based on the aggregate equity value of the Company derived from the Series B convertible preferred stock offering price of $17.00 per share. The subsequent remeasurement also considered, in part, a risk-free rate of 0.17%, an expected volatility of 80%, and the expected term to a liquidity event of 0.5 years.

Based on the analysis, the Company recorded a preferred stock tranche liability of $1.1 million at the issue date to account for the obligation to issue the Milestone Shares at a predetermined fixed price at a future settlement date. The Company remeasured the fair value of the entire tranche liability at June 30, 2020, and recognized a non-cash expense of $17.0 million in the condensed consolidated statement of operations. Between June 30, 2020 and July 2, 2020, all of the 4,000,000 Milestone Shares were issued and the related tranche liability was extinguished in its entirety, and the Company reclassified $18.1 million to convertible preferred stock on the condensed consolidated balance sheet.

Note 7—Stock-Based Compensation

On July 1, 2020, the Company's board of directors approved the Existing Plan which permits the granting of incentive stock options, non-statutory stock options, stock appreciation rights, RSAs, RSUs and other stock-based awards to employees, directors, officers and consultants. On July 1, 2020, 3,529,412 shares of common stock were authorized for issuance under the Existing Plan. On September 16, 2020, the Company increased the number of shares of common stock authorized for issuance under the Existing Plan to 3,845,294.

On September 16, 2020, the Company's stockholders approved the New Plan, which became effective upon the execution of the underwriting agreement in connection with the IPO. The number of shares available for future issuance under the New Plan is the sum of (1) 3,390,168 new shares of common stock, (2) 209,841 remaining shares of common stock reserved under the Existing Plan that became available for issuance upon the effectiveness of the New Plan and (3) the number of shares of common stock subject to outstanding awards under the Existing Plan when the New Plan became effective that thereafter expire or are forfeited, canceled, withheld to satisfy tax withholding or to purchase or exercise an award, repurchased by the Company or are otherwise terminated. At December 31, 2020, there were 2,941,509 shares available for future grant under the New Plan. The number of shares of common stock reserved for issuance under the New Plan will automatically increase on January 1 of each year, for a period of ten years, from January 1, 2021 continuing through January 1, 2030, by 5% of the total number of shares of common stock outstanding on December 31 of the preceding calendar year, or a lesser number of shares as may be determined by the Company's board of directors. On January 1, 2021 the board of directors increased the number of common stock reserved for issuance under the New Plan by 1,434,934 shares.

Furthermore, on September 16, 2020, the Company's stockholders approved the Employee Stock Purchase Plan ("ESPP"), which became effective upon the execution of the underwriting agreement in connection with the IPO. The maximum number of shares of common stock that may be issued under the ESPP will not exceed 362,000 shares of common stock, plus the number of shares of common stock that are automatically added on January 1st of each year for a period of up to ten years, commencing on the first January 1 following the IPO Date and ending on (and including) January 1, 2030, in an amount equal to the lesser of (i) one percent (1.0%) of the total number of shares of capital stock outstanding on December 31st of the preceding calendar year, and (ii) 724,000 shares of common stock. No shares have been added to the ESPP as of January 1, 2021 and no issuances have been made under the ESPP as of September 30, 2021.

Stock Options

On July 1, 2020, options to purchase 2,896,782 shares of common stock under the Existing Plan were awarded to certain employees and consultants of the Company with an exercise price per share of $0.80, which were expected to vest over a four-year period, all of which were subsequently cancelled (the "Cancelled Options"). The grant date fair value of the Cancelled Options was $13.8 million at the original grant date. In exchange, the Company awarded 2,518,932 RSUs on September 2, 2020, which are expected to vest over a four-year term. The Company accounted for the changes in award terms as a modification in accordance with ASC 718 Compensation – Stock Compensation. The modification was accounted for as an exchange of the original award for a new award with total compensation cost equal to the grant-date fair value of the original award plus any incremental value measured on the modification date. The Company determined that there was no incremental value as the fair value of the original award immediately before the modification was greater than the fair value of the new award immediately after the modification. Accordingly, the Company continues to recognize the remaining compensation cost of the Cancelled Options over the vesting period of the RSUs.

For the three months ended September 30, 2021, 415,100 shares of common stock under the New Plan were awarded with a weighted-average grant date fair value per share of $12.83. For the nine months ended September 30, 2021, 3,001,750 shares of common stock under the New Plan were awarded with a weighted-average grant date fair value per share of $16.64. The stock options vest over one to four years and have a ten-year contractual term.

The following weighted-average assumptions were used to estimate the fair value of stock options that were granted during the three and nine months ended September 30, 2021 and 2020:

	Three months ended September 30,		Nine months ended September 30,	
	2021	2020	2021	2020
Risk-free interest rate	1.02%	0.46%	0.83%	0.46%
Expected dividend yield	—	—	—	—
Expected term in years	6.1	6.7	6.0	6.7
Expected volatility	75%	80%	75%	80%

The following table summarizes stock option activity, during the nine months ended September 30, 2021:

	Stock Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2020	674,842	20.68	9.8	$ 3,953
Options granted	3,001,750	25.46		
Options cancelled or forfeited	(159,600)	27.14		
Outstanding at September 30, 2021	3,516,992	$ 24.47	9.4	$ 175
Vested and expected to vest at September 30, 2021	3,516,992	$ 24.47	9.4	$ 175
Options exercisable at September 30, 2021	84,349	$ 20.08	9.0	$ 17

The aggregate intrinsic value in the above table is calculated as the difference between the fair value of the Company's common stock as of September 30, 2021 and the exercise price of the stock options. As of September 30, 2021, the total unrecognized compensation related to unvested stock option awards granted was $47.3 million, which the Company expects to recognize over a weighted-average period of approximately 3.3 years. No stock options were exercised during the period.

Restricted Stock Units

On September 2, 2020, the Company issued 331,121 RSUs to an employee under the Existing Plan; 25% of the shares of common stock underlying the RSUs vest at each anniversary over a four-year period. The RSUs are subject to a service-based vesting condition. The RSUs were also subject to a liquidity-based performance vesting condition that was met upon the closing of the IPO. The Company at any time may accelerate the vesting of the RSUs. Such shares are not accounted for as outstanding until they vest. As of September 30, 2021, the total unrecognized compensation related to unvested RSUs granted, including the remaining compensation cost associated with the RSUs granted on September 2, 2020 in exchange for the Cancelled Options, was $11.8 million which is expected to be amortized on a straight-line basis over the weighted-average remaining vesting period of approximately 1.3 years.

The Company's default tax withholding method for RSUs is the sell-to-cover method, in which shares with a market value equivalent to the tax withholding obligation are sold on behalf of the holder of the RSUs upon vesting and settlement to cover the tax withholding liability and the cash proceeds from such sales are remitted by the Company to taxing authorities.

The Company’s RSU activity for the nine months ended September 30, 2021 was as follows:

	Number of Shares	Weighted Average Grant Date Fair Value per Share
Nonvested at January 1, 2021	2,850,053	$ 6.37
Restricted units granted	—	—
Vested	(712,510)	6.37
Cancelled or forfeited	(250,778)	5.25
Nonvested at September 30, 2021	1,886,765	$ 6.52

Restricted Stock Awards

RA Session II, the Company’s President and Chief Executive Officer, was awarded 769,058 RSAs under the Existing Plan on July 1, 2020, which are expected to vest over a three-year term, subject to continuous employment. As of September 30, 2021, the total unrecognized compensation related to unvested RSAs granted was $2.2 million which is expected to be amortized on a straight-line basis over the weighted-average remaining vesting period of approximately 0.8 years. The fair value of these RSAs at the grant date of July 1, 2020 was $5.28 per share.

The Company’s RSA activity for the nine months ended September 30, 2021 was as follows:

	Number of Shares	Weighted Average Grant Date Fair Value per Share
Nonvested at December 31, 2020	769,058	$ 5.28
Restricted stock granted	—	—
Vested	(362,963)	5.28
Nonvested at September 30, 2021	406,095	$ 5.28

The following table summarizes the total stock-based compensation expense for the stock options, RSAs and RSUs recorded in the condensed consolidated statements of operations for the three and nine months ended September 30, 2021 and 2020 (in thousands):

	For the Three Months Ended September 30,		For the Nine Months Ended September 30,	
	2021	2020	2021	2020
Research and development expense	$ 2,305	$ 399	$ 6,098	$ 399
General and administrative expense	2,781	942	7,131	942
Total	$ 5,086	$ 1,341	$ 13,229	$ 1,341

Note 8—Net Loss Per Common Share

Basic net loss per common share is computed by dividing net loss attributable to common stockholders by the weighted-average number of shares of common stock outstanding for the period. Since the Company had a net loss in all periods presented, basic and diluted net loss per common share are the same.

The following table represents the calculation of basic and diluted net loss per common share (in thousands, except share and per share data):

	For the Three Months Ended September 30,		For the Nine Months Ended September 30,	
	2021	2020	2021	2020
Net loss	$ (51,187)	$ (15,042)	$ (124,137)	$ (41,693)
Weighted-average shares of common stock outstanding used to compute net loss per common share, basic and diluted	38,003,954	11,733,170	37,495,537	11,176,429
Net loss per common share, basic and diluted	$ (1.35)	$ (1.28)	$ (3.31)	$ (3.73)

The following common stock equivalents outstanding as of September 30, 2021 and 2020 were excluded from the computation of diluted net loss per share attributable to common stockholders for the periods presented because including them would have been anti-dilutive:

	September 30, 2021	September 30, 2020
Unvested RSUs	1,886,765	2,850,053
Unvested RSAs	406,095	769,058
Stock options	3,516,992	185,342
Total	5,809,852	3,804,453

Note 9—Related Party Transactions

RA Session II, President and Chief Executive Officer and a member of the Company's board of directors, was a guarantor under the Guaranty and Security Agreement between himself, Queen's and the Company, and in the event of the Company's failure to fund its obligations under the RGA with Queen's, had personally guaranteed payments due by the Company to Queen's. In addition, the Company entered into two secured promissory notes with Mr. Session in January 2020 for an aggregate of $1.67 million, with 10% interest. The Company secured the notes with a first priority security interest in certain assets of the Company. During March 2020, the Company repaid $1.65 million of the notes, and the remaining balance was repaid in July 2020.

In March 2020, the Company entered into a services agreement with PBM Capital Group, LLC ("PBM"), an affiliate of PBM TGT Holdings, LLC whereby PBM provided accounting and other administrative and management services related to payroll administration, human resources, bookkeeping, preparation of financial statements and tax returns, accounts payable and receivable, and other similar functions for a fee of $2,500 per month. Paul B. Manning, a member of the Company's board of directors and a holder of more than 5% of the Company's capital stock, is the Chief Executive Officer of PBM Capital Group, LLC and has sole voting and investment power with respect to the shares held by PBM TGT Holdings, LLC. In September 2020, PBM TGT Holdings, LLC distributed all of the shares of Series A convertible preferred stock it previously held to its beneficial owners, including Mr. Manning and entities controlled by Mr. Manning, for no additional consideration in accordance with the terms of its operating agreement. In April 2021, the PBM services agreement was terminated and all outstanding amounts due have been paid.

Note 10—Income Taxes

Deferred tax assets and liabilities are determined based on the difference between the financial statement and tax bases of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. Valuation allowances are provided if based upon the weight of available evidence, it is more likely than not that some or all of the deferred tax

assets will not be realized. The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. There is no provision for income taxes because the Company has incurred operating losses and capitalized certain items for income tax purposes since its inception and maintains a full valuation allowance against its net deferred tax assets. The reported amount of income tax expense for the period differs from the amount that would result from applying the federal statutory tax rate to net loss before taxes primarily because of the change in valuation allowance.

As of September 30, 2021, there were no material changes to either the nature or the amounts of the uncertain tax positions previously determined for the year ended December 31, 2020.

Note 11—Commitments and Contingencies

Litigation

The Company is not a party to any material legal proceedings and is not aware of any pending or threatened claims. From time to time, the Company may be subject to various legal proceedings and claims that arise in the ordinary course of its business activities.

Commitments

In the normal course of business, the Company enters into contracts that contain a variety of indemnifications with its employees, licensors, suppliers and service providers. The Company's maximum exposure under these arrangements is unknown at September 30, 2021. The Company does not anticipate recognizing any significant losses relating to these arrangements.

Durham Lease

On December 17, 2020, the Company entered into a lease agreement (the "Durham Lease") with Patriot Park Partners II, LLC, a Delaware limited liability company (the "Durham Landlord"), pursuant to which the Company agreed to lease approximately 187,500 square feet of a manufacturing facility located at 5 National Way, Durham, North Carolina (the "Facility"). The Durham Lease commenced on April 1, 2021 and is expected to have a term of approximately fifteen years and six months. The Company has two options to extend the term of the Durham Lease, each for a period of an additional five years.

The Company was not required to provide a security deposit in connection with its entry into the Durham Lease. The Company will be responsible for constructing interior improvements within the Facility. The Company was required to place $2.6 million in an escrow account which will be released when the improvements are substantially complete. The escrow funds are recorded as restricted cash on the condensed consolidated balance sheet as of September 30, 2021 and are expected to be released in 2023. The Durham Landlord has the right to terminate the Durham Lease upon specified events of default, including the Company's failure to pay rent in a timely manner and upon the occurrence of certain events of insolvency with respect to the Company.

The Company incurred initial direct costs to enter into the Durham Lease of approximately $0.8 million. The costs have been recorded on the condensed consolidated balance sheets as a deferred lease asset and are being amortized into earnings over the term of the Durham Lease.

In accordance with ASC Topic 840, *Leases*, the Company is deemed, for accounting purposes only, to be the owner of the entire leased Facility, including the building shell, during the construction period because of the Company's expected level of direct financial and operational involvement in the substantial tenant improvements, including structural improvements, required to build out the Facility. As a result, the Company capitalized approximately $26.3 million as a build-to-suit asset within property, plant and equipment, net and recognized a corresponding build-to-suit lease financing obligation as a liability on its condensed consolidated balance sheets equal to the fair value of the existing building shell using comparable market prices per square foot for similar space for public real estate transactions in the surrounding area at commencement of construction. Additionally, construction costs incurred as part of the build-out and tenant improvements are also capitalized within property, plant and equipment, net. Costs of approximately $10.5 million have been capitalized during the nine months ended September 30, 2021, related to both equipment purchases and the build-out of the leased Facility. Construction is expected to be completed in 2023, upon which time the Company will assess and determine if the build-to-suit asset and corresponding liability should be de-recognized.

Dallas Lease

On January 11, 2021, the Company entered into a lease agreement (the "Dallas Lease") with Pegasus Park, LLC, a Delaware limited liability company (the "Dallas Landlord"), pursuant to which the Company will lease approximately 15,000 square feet of office space at 3000 Pegasus Park Drive, Dallas, Texas 75247 (the "Office Space").

The Dallas Lease commenced on May 27, 2021, and has a term of approximately ten years. The Company has an option to extend the term of the Dallas Lease for one additional period of five years. The Company's obligation for the payment of base rent for the Office Space is initially approximately $32,500 per month and will increase annually, up to an estimated monthly base rent of $50,000 during the term of the Dallas Lease. The Company is obligated to pay operating costs and utilities applicable to the Office Space. The Company was required to provide a security deposit of $32,500 in connection with its entry into the Dallas Lease. Total future minimum lease payments under the Dallas Lease over the initial 10 year term are approximately $4.9 million. The Company is responsible for costs of constructing interior improvements within the Office Space that exceed a construction allowance provided by the Dallas Landlord not to exceed $40.00 per rentable square foot.

The Company has a right of first refusal with respect to certain additional adjacent office space before the Dallas Landlord accepts any offer for such space.

The Dallas Landlord has the right to terminate the Dallas Lease, or the Company's right to possess the Office Space without terminating the Dallas Lease, upon specified events of default, including the Company's failure to pay rent in a timely manner and upon the occurrence of certain events of insolvency with respect to the Company.

As of September 30, 2021, the Company recognized approximately $0.6 million of lease construction incentive based on the construction allowance provided. The construction incentive has been recorded on the condensed consolidated balance sheets as a deferred lease incentive obligation and is being amortized into earnings as a deduction of rent expense over the term of the Dallas Lease.

Note 12 — Subsequent Events

Acquisition of Option to License Worldwide Rights to Clinical-Stage AAV9 Gene Therapy Program for CLN7 Disease

In October 2021, the Company announced its exclusive option to license the worldwide rights to a clinical-stage AAV9 gene therapy program for the treatment of CLN7, a form of Batten disease. The first-generation construct for the CLN7 program was developed in the laboratory of Steven Gray, Ph.D., Associate Professor at UT Southwestern Chief Scientific Advisor for the Company. The CLN7 program is currently in a Phase 1 clinical proof-of-concept trial run by UT Southwestern, and the Company expects the availability of preliminary human proof-of-concept clinical safety and efficacy data from the first-generation construct by year-end 2021. The Company also entered into a research collaboration with UT Southwestern to develop a next-generation construct for the treatment of CLN7 disease, which is expected to improve potency, safety profile, packaging efficiency and manufacturability over the first-generation construct. Completion of the next-generation construct design is anticipated by year-end 2021 with commercial-grade GMP material expected in 2022. The Company intends to initiate a planned pivotal trial using the next-generation construct in 2022, with reference to the human proof-of-concept clinical data being generated from the first generation construct.

Sales Agreement

On October 5, 2021, the Company entered into a Sales Agreement (the "Sales Agreement") with SVB Leerink LLC and Wells Fargo Securities, LLC (collectively, the "Sales Agents"), pursuant to which the Company may issue and sell, from time to time, shares of its common stock having an aggregate offering price of up to $150.0 million through the Sales Agents. The Sales Agents may sell common stock by any method permitted by law deemed to be an "at the market offering" as defined in Rule 415(a)(4) of the Securities Act, including sales made directly on or through the Nasdaq Global Select Market or any other existing trade market for the common stock, in negotiated transactions at market prices prevailing at the time of sale or at prices related to prevailing market prices, or any other method permitted by law. The Sales Agents will be entitled to receive 3.0% of the gross sales price per share of common stock sold under the Sales Agreement. As of the date of these financial statements, no shares of common stock have been issued and sold pursuant to the Sales Agreement.

Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations.

The following discussion and analysis of our financial condition and results of operations should be read in conjunction with our unaudited condensed consolidated financial statements and related notes included in this Quarterly Report on Form 10-Q and the audited financial statements and notes thereto as of and for the year ended December 31, 2020 and the related Management's Discussion and Analysis of Financial Condition and Results of Operations, included in our Annual Report on Form 10-K for the year ended December 31, 2020, or Annual Report, filed with the Securities and Exchange Commission, or the SEC, on March 3, 2021. Unless the context requires otherwise, references in this Quarterly Report on Form 10-Q to "we," "us," and "our" refer to Taysha Gene Therapies, Inc. together with its consolidated subsidiaries.

Forward-Looking Statements

The information in this discussion contains forward-looking statements and information within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, which are subject to the "safe harbor" created by those sections. These forward-looking statements include, but are not limited to, statements concerning our strategy, future operations, future financial position, future revenues, projected costs, prospects and plans and objectives of management. The words "anticipates," "believes," "estimates," "expects," "intends," "may," "plans," "projects," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions, or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements that we make. These forward-looking statements involve risks and uncertainties that could cause our actual results to differ materially from those in the forward-looking statements, including, without limitation, the risks set forth in Part II, Item 1A, "Risk Factors" in our Annual Report. The forward-looking statements are applicable only as of the date on which they are made, and we do not assume any obligation to update any forward-looking statements.

Note Regarding Trademarks

All brand names or trademarks appearing in this report are the property of their respective holders. Unless the context requires otherwise, references in this report to the "Company," "we," "us," and "our" refer to Taysha Gene Therapies, Inc.

Overview

We are a patient-centric gene therapy company focused on developing and commercializing AAV-based gene therapies for the treatment of monogenic diseases of the central nervous system, or CNS, in both rare and large patient populations. We were founded in partnership with The University of Texas Southwestern Medical Center, or UT Southwestern, to develop and commercialize transformative gene therapy treatments. Together with UT Southwestern, we are advancing a deep and sustainable product portfolio of 27 gene therapy product candidates, with exclusive options to acquire four additional development programs at no cost. By combining our management team's proven experience in gene therapy drug development and commercialization with UT Southwestern's world-class gene therapy research capabilities, we believe we have created a powerful engine to develop transformative therapies to dramatically improve patients' lives. In April, we acquired exclusive worldwide rights to TSHA-120, a clinical-stage, intrathecally dosed AAV9 gene therapy program for the treatment of giant axonal neuropathy, or GAN. A Phase 1/2 clinical trial of TSHA-120 is being conducted by the National Institutes of Health or NIH, under an accepted investigational new drug application, or IND, and we anticipate clinical safety and functional MFM32 data for TSHA-120 from the highest dose cohort of $3.5x10^{14}$ total vg in December 2021, where we believe continued clinically meaningful slowing of disease progression similar to that achieved with the lower dose cohorts would be considered confirmatory of disease modification. A Phase 1/2 clinical trial of TSHA-101 was initiated by Queen's University at Kingston, or Queen's University, under an accepted Clinical Trial Application, or CTA, in Canada, and Queen's University expects to report preliminary clinical safety data and HEX A enzyme activity in plasma and cerebral spinal fluid, or CSF, for TSHA-101 in GM2 gangliosidosis in December 2021, where Hex A enzyme activity level of at least 5% in plasma would be considered disease modifying based on natural history data. Based on natural history data, 2% to 4% Hex A enzyme activity in plasma normalizes survival and significantly improves clinical phenotype of GM2 gangliosidosis. We recently announced an exclusive option from UT Southwestern to license worldwide rights to a clinical-stage CLN7 program. The CLN7 program is currently in a Phase 1 clinical proof-of-concept trial run by UT Southwestern, and we expect preliminary clinical safety data for the first patient in history to be intrathecally dosed at $1.0x10^{15}$ total vg with the first-generation construct by December 2021. We expect completion of a next-generation construct for CLN7 by year-end 2021 with initiation of a planned pivotal clinical trial in 2022 using next-generation construct with reference to the human proof-of-concept clinical data generated from the first-generation construct. We are also developing TSHA-118 for the treatment of CLN1 disease (one of the forms of Batten disease). We intend to initiate a Phase 1/2 clinical trial in CLN1 disease by year-end 2021 and expect clinical safety and PPT1 enzyme activity data in the first half of 2022.

For Rett syndrome, we intend to submit an IND / CTA filing in November 2021 and initiate a Phase 1/2 clinical trial by year-end 2021 with preliminary clinical data expected by year-end 2022.

We have a limited operating history. Since our inception, our operations have focused on organizing and staffing our company, business planning, raising capital and entering into collaboration agreements for conducting preclinical research and development activities for our product candidates. All of our lead product candidates are still in the clinical or preclinical development stage. We do not have any product candidates approved for sale and have not generated any revenue from product sales. We have funded our operations primarily through the sale of equity, raising an aggregate of $307.0 million of gross proceeds from our initial public offering and private placements of our convertible preferred stock. In addition, we drew down $30.0 million in term loans on August 12, 2021.

On August 12, 2021, or the Closing Date, we entered into a Loan and Security Agreement, or the Term Loan Agreement, with the lenders party thereto from time to time, or the Lenders and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders, or the Agent. The Term Loan Agreement provides for (i) on the Closing Date, $40.0 million aggregate principal amount of term loans available through December 31, 2021, (ii) from January 1, 2022 until September 30, 2022, an additional $20.0 million term loan facility available at the Company's option upon having three distinct and active clinical stage programs at the time of draw, (iii) from October 1, 2022 until March 31, 2023, an additional $20.0 million term loan facility available at our option upon having three distinct and active clinical stage programs at the time of draw and (iv) from April 1, 2023 until December 31, 2023, an additional $20.0 million term loan facility available upon approval by the Agent and the Lenders, or, collectively, the Term Loans. We drew $30.0 million in term loans on the Closing Date. The loan repayment schedule provides for interest only payments until August 31, 2024, followed by consecutive monthly payments of principal and interest. All unpaid principal and accrued and unpaid interest with respect to each term loan is due and payable in full on August 1, 2026.

Since our inception, we have incurred significant operating losses. Our net losses were $124.1 million for the nine months ended September 30, 2021 and $41.7 million for the nine months ended September 30, 2020. As of September 30, 2021, we had an accumulated deficit of $185.3 million. We expect to continue to incur significant expenses and operating losses for the foreseeable future. We anticipate that our expenses will increase significantly in connection with our ongoing activities, as we:

- continue to advance the preclinical and clinical development of our product candidates and preclinical and discovery programs;
- conduct our ongoing clinical trials of TSHA-101 and TSHA-120, as well as initiate and complete additional clinical trials TSHA-118, TSHA-102, TSHA-121 and any other current and future product candidates that we advance;
- seek regulatory approval for any product candidates that successfully complete clinical trials;
- continue to develop our gene therapy product candidate pipeline and next-generation platforms;
- scale up our clinical and regulatory capabilities;
- manufacture current Good Manufacturing Practice, or cGMP material for clinical trials or potential commercial sales;
- establish and validate a commercial-scale cGMP manufacturing facility;
- establish a commercialization infrastructure and scale up internal and external manufacturing and distribution capabilities to commercialize any product candidates for which we may obtain regulatory approval;
- adapt our regulatory compliance efforts to incorporate requirements applicable to marketed products;
- maintain, expand and protect our intellectual property portfolio;
- hire additional clinical, manufacturing quality control, regulatory, manufacturing and scientific and administrative personnel;
- add operational, financial and management information systems and personnel, including personnel to support our product development and planned future commercialization efforts; and
- incur additional legal, accounting and other expenses in operating as a public company.

Our Pipeline

We are advancing a deep and sustainable product portfolio of 27 gene therapy product candidates for monogenic diseases of the CNS in both rare and large patient populations, with exclusive options to acquire four additional development programs at no cost. Our portfolio of gene therapy candidates targets broad neurological indications across three distinct therapeutic categories: neurodegenerative diseases, neurodevelopmental disorders and genetic epilepsies. Our current pipeline, including the stage of development of each of our product candidates, is represented in the table below.

Recent Developments

TSHA-120 for Giant Axonal Neuropathy (GAN)

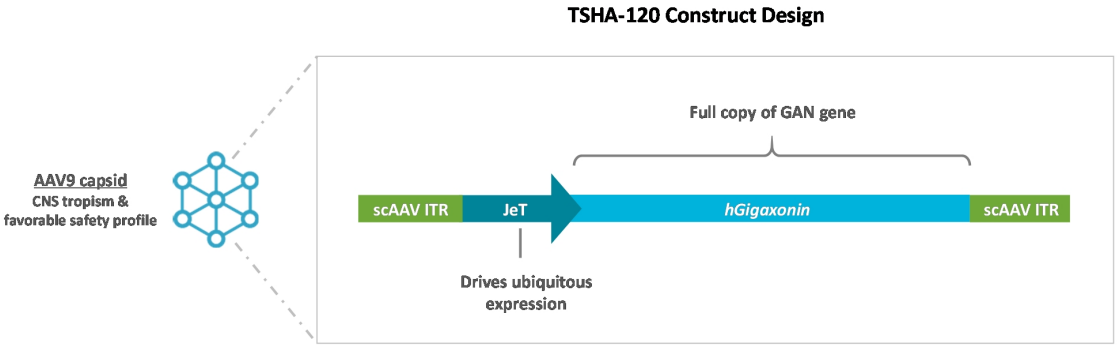
In March 2021, we acquired the exclusive worldwide rights to a clinical-stage, intrathecally dosed AAV9 gene therapy program, now known as TSHA-120, for the treatment of giant axonal neuropathy, or GAN, pursuant to a license agreement with Hannah's Hope Fund for Giant Axonal Neuropathy, Inc., or HHF. Under the terms of the agreement, HHF received an upfront payment of $5.5 million and will be eligible to receive clinical, regulatory and commercial milestones totaling up to $19.3 million, as well as a low, single-digit royalty on net sales upon commercialization of TSHA-120.

GAN is a rare autosomal recessive disease of the central and peripheral nervous systems caused by loss-of-function gigaxonin gene mutations. The estimated prevalence of GAN is 2,400 patients in the United States and European Union.

Symptoms and features of children with GAN usually develop around the age of five years and include an abnormal, wide based, unsteady gait, weakness and some sensory loss. There is often associated dull, tightly curled, coarse hair, giant axons seen on a nerve biopsy, and spinal cord atrophy and white matter abnormality seen on MRI. Symptoms progress and as the children grow older they develop progressive scoliosis and contractures, their weakness progresses to the point where they will need a wheelchair for mobility, respiratory muscle strength diminishes to the point where the child will need a ventilator (usually in the early to mid-teens) and the children often die during their late teens or early twenties, typically due to respiratory failure. There is an early- and late-onset phenotype associated with the disease, with shared physiology. The late-onset phenotype is often categorized as Charcot-Marie-Tooth Type 2, or CMT2, with a lack of tightly curled hair and CNS symptoms with relatively slow progression of disease. This phenotype represents up to 6% of all CMT2 diagnosis. In the late-onset population, patients have poor quality of life but the disease is not life-

limiting. In early-onset disease, symptomatic treatments attempt to maximize physical development and minimize the rate of deterioration. Currently, there are no approved disease-modifying treatments available.

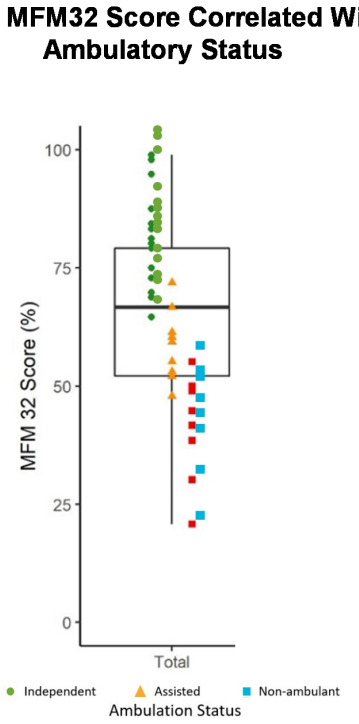
TSHA-120 is an AAV9 self-complementary viral vector encoding the full length human gigaxonin protein. The construct was invented by Dr. Steven Gray and is the first AAV9 gene therapy candidate to deliver a functional copy of the GAN gene under the control of a JeT promoter that drives ubiquitous expression.



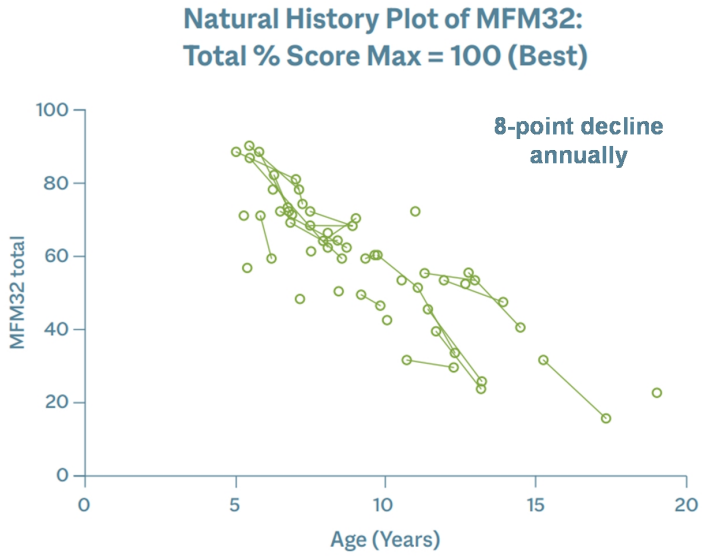
We have received orphan drug designation and rare pediatric disease designation from the FDA for TSHA-120 for the treatment of GAN.

There is an ongoing longitudinal prospective natural history study being led by the NIH, that has already identified and followed a number of patients with GAN for over five years with disease progression characterized by a number of clinical assessments. The GAN natural history study was initiated in 2013 and included 45 GAN patients, aged 3 to 21 years. Imaging data from this study has demonstrated that there are distinctive increased T2 signal abnormalities within the cerebellar white matter surrounding the dentate nucleus of the cerebellum, which represents one of the earliest brain imaging findings in individuals with GAN. These findings precede the more widespread periventricular and deep white matter signal abnormalities associated with advanced disease. In addition, cortical and spinal cord atrophy appeared to correspond to more advanced disease severity and older age. Impaired pulmonary function in patients with GAN also was observed, with forced vital capacity correlating well with several functional outcomes such as the MFM32, a validated 32-item scale for motor function measurement developed for neuromuscular diseases. Nocturnal hypoventilation and sleep apnea progressed over time, with sleep apnea worsening as ambulatory function

deteriorated. Total MFM32 score also correlated with ambulatory status, where independently ambulant individuals performed better and had higher MFM32 scores than the non-ambulant group, as shown in the graph below.



Patients also reported significant autonomic dysfunction based on the COMPASS 31 self-assessment questionnaire. In addition, nerve conduction function demonstrated progressive sensorimotor polyneuropathy with age. As would be expected for a neurodegenerative disease, younger patients have higher baseline MFM32 scores. However, the rate of decline in the MFM32 scores demonstrated consistency across patients of all ages, with most demonstrating an average 8-point decline per year regardless of age and/or baseline MFM32 score, as shown in the natural history plot below.



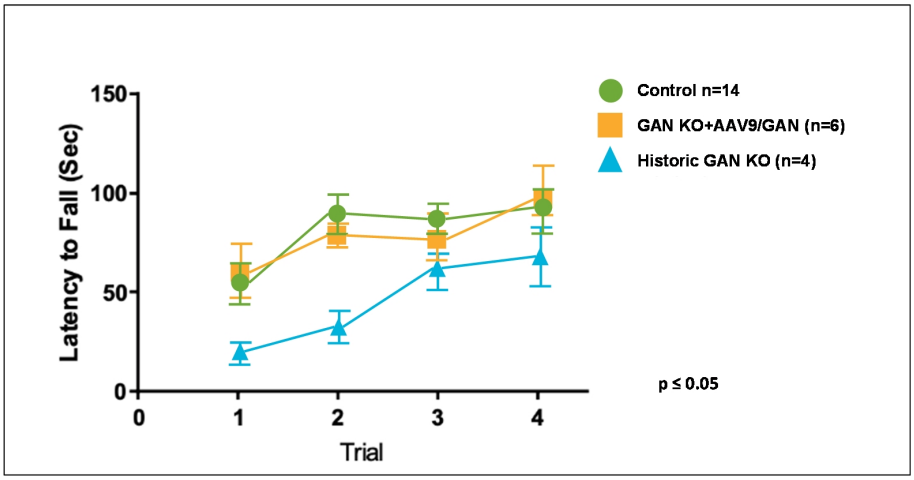
A 4-point score change in the MFM32 is considered clinically meaningful, suggesting that GAN patients lose significant function annually. To date we have up to eight years of robust data from this study.

Preclinical Data

TSHA-120 performed well across *in vitro* and *in vivo* studies, and demonstrated improved motor function and nerve pathology, and long-term safety across several animal models. Of note, improved dorsal root ganglia, or DRG, pathology was demonstrated in TSHA-120-treated GAN knockout mice. These preclinical results have been published in a number of peer-reviewed journals.

Additional preclinical data from a GAN knockout rodent model that had received AAV9-mediated GAN gene therapy demonstrated that GAN rodents treated at 16 months performed significantly better than 18-month old untreated GAN rodents and equivalently to controls. These rodents were evaluated using a rotarod performance test which is designed to evaluate endurance, balance, grip strength and motor coordination in rodents. The time to fall off the rotarod, known as latency, was also evaluated and the data below demonstrate the clear difference in latency in treated versus untreated GAN rodents.

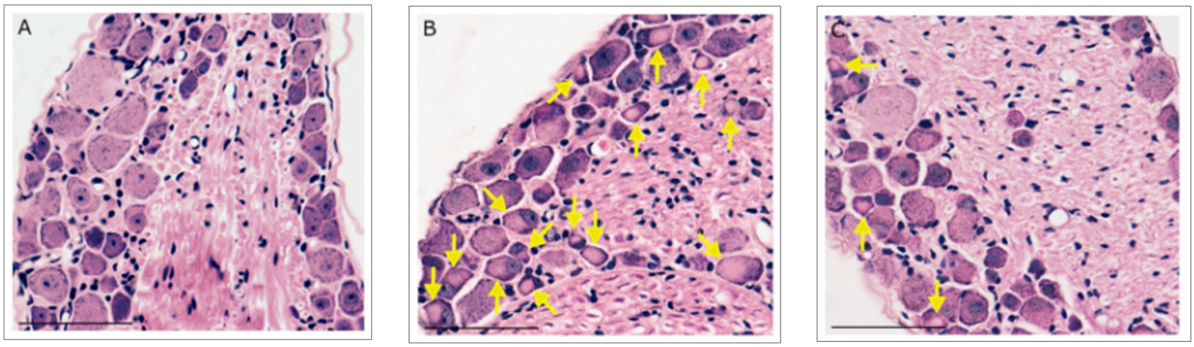
TSHA-120 normalized performance of 18-month-old GAN rodent knockout model



A result is considered statistically significant when the probability of the result occurring by random chance, rather than from the efficacy of the treatment, is sufficiently low. The conventional method for determining the statistical significance of a result is known as the "p-value," which represents the probability that random chance caused the result (e.g., a p-value = 0.01 means that there is a 1% probability that the difference between the control group and the treatment group is purely due to random chance). Generally, a p-value less than 0.05 is considered statistically significant.

With respect to dorsal root ganglia, or DRG, inflammation that has been a topic of considerable interest within the gene therapy circles, in GAN and in the majority of diseases in our neurodegenerative franchise, the DRG have a significantly abnormal histological appearance and function as a consequence of underlying disease pathophysiology. Treatment with TSHA-120 resulted in considerable improvements in the pathological appearance of the DRG in the GAN knockout mice. Shown below is tissue from a GAN knockout mouse model with numerous abnormal neuronal inclusions containing aggregates of damaged neurofilament in the DRG as indicated by the yellow arrows. On image C, the tissue from the GAN knockout mice treated with an intrathecal injection of TSHA-120 had a notable improvement in the reduction of these neuronal inclusions in the DRG.

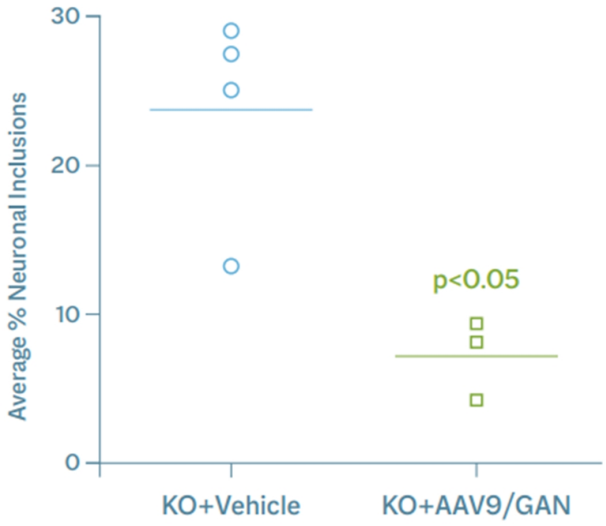
TSHA-120 Improved Pathology of DRG in GAN Knockout Mice



Normal control | **GAN KO – vehicle injected** | **GAN KO – AAV9-GAN**

When a quantitative approach to the reduction in inclusions in the DRG was applied, it was observed that TSHA-120 treated mice experienced a statistically significant reduction in the average number of neuronal inclusions versus the GAN knockout mice that received vehicle as illustrated below.

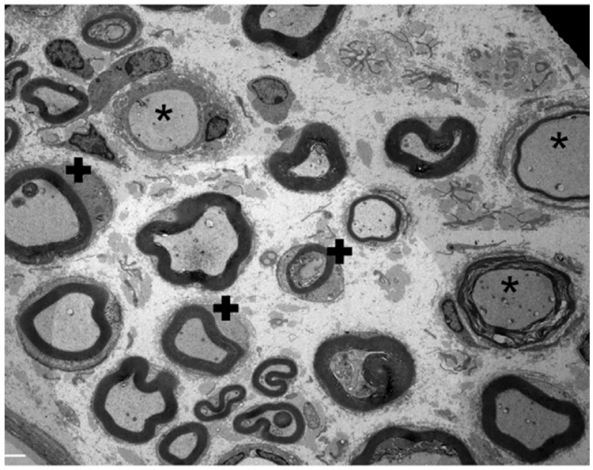
TSHA-120 Significantly Reduced Percentage of Neuronal Inclusions



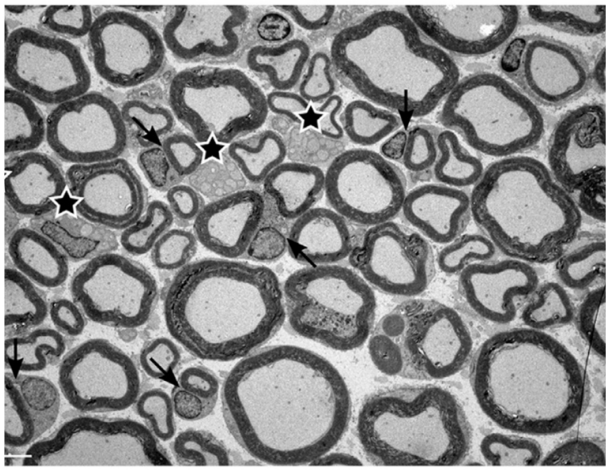
Additionally, TSHA-120 demonstrated improved pathology of the sciatic nerve in the GAN knockout mice as shown below.

TSHA-120 Improved Pathology of the Sciatic Nerve in the GAN KO Mice

KO



KO + AAV9/GAN



✱ Dense, disorganized accumulations of NFs in fibers

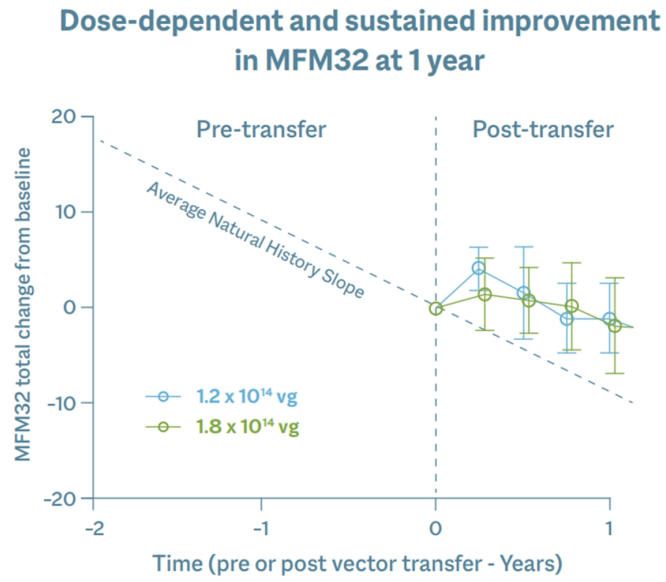
✚ Accumulation of IFs in Schwann cell cytoplasm associated with myelinated fibers

★ Intact unmyelinated fibers and associated Schwann cells

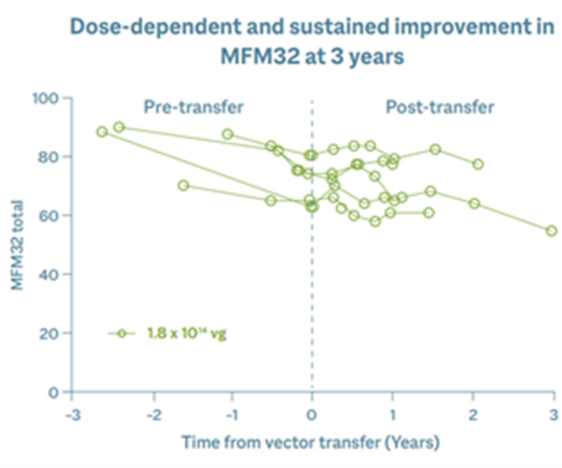
➡ Normal Schwann cell cytoplasm associated with myelinated fibers

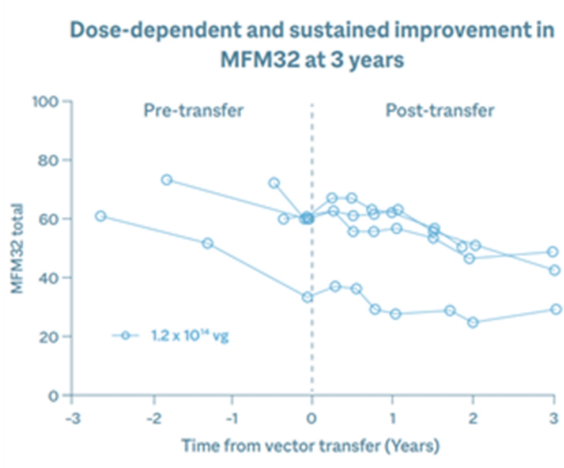
Results of Ongoing Phase 1/2 Clinical Trial

A Phase 1/2 clinical trial of TSHA-120 is being conducted by the NIH under an accepted IND. The ongoing trial is a single-site, open-label, non-randomized dose-escalation trial, in which patients are intrathecally dosed with one of 4 dose levels of TSHA-120 – $3.5x10^{13}$ total vg, $1.2x10^{14}$ total vg, $1.8x10^{14}$ total vg or $3.5x10^{14}$ total vg. The primary endpoint is to assess safety, with secondary endpoints measuring efficacy using pathologic, physiologic, functional, and clinical markers. To date, 14 patients have been intrathecally dosed and ten patients have at least three years' worth of long-term follow up data. The $1.8x10^{14}$ total vg dose and $1.2x10^{14}$ total vg cohorts demonstrated dose-related and meaningful slowing of disease progression in the first year post dosing, as illustrated below. The $1.8x10^{14}$ total vg dose effected a statistically significant 8-point improvement versus the historical control over the course of a year and the $1.2x10^{14}$ total vg dose effected a statistically significant 6-point improvement over the course of a year.



Six patients in the trial have been followed for more than three years. Patients dosed with $1.8x10^{14}$ total vg and $1.2x10^{14}$ total vg have shown sustained dose-dependent improvements in MFM32 scores for more than three years, as illustrated below.



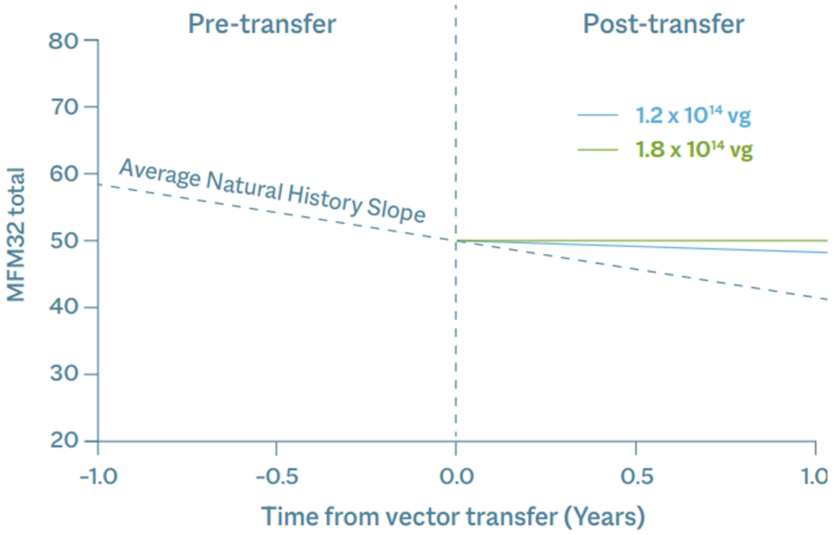


To date, TSHA-120 has been well-tolerated at multiple doses with no signs of significant acute or subacute inflammation, no sudden sensory changes and no drug-related or persistent elevation of transaminases. We expect to report safety and MFM32 functional data from the highest dose cohort of $3.5x10^{14}$ total vg in December 2021.

Bayesian Analysis of TSHA-120

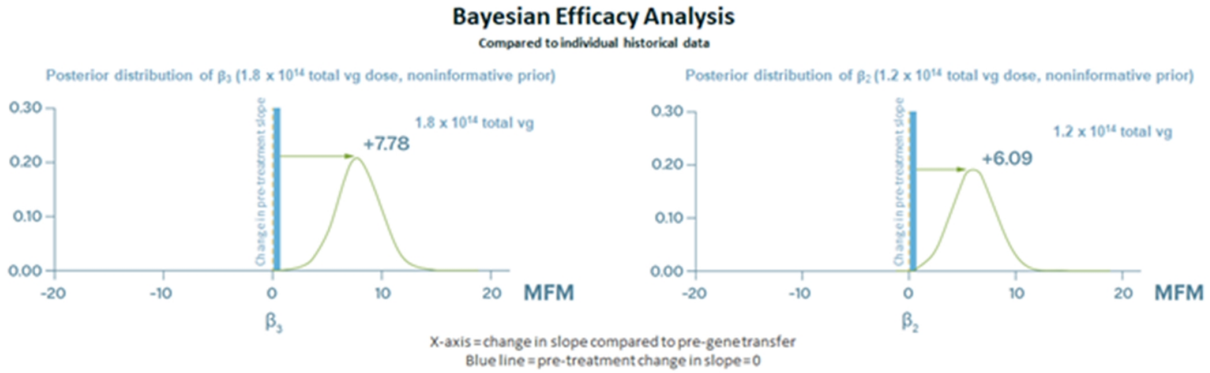
To gain further insight into the impact of TSHA-120 treatment on GAN disease progression and to add more robustness to the data, an additional analysis utilizing Bayesian statistical methodology was performed. Bayesian analysis is a useful method that enables direct probability statements about any unknown quantity of interest to be made, in this case, a statement around the probability of a clinically meaningful improvement in MFM32. Bayesian analysis also enables immediate incorporation into the analysis of data gathered as the trial progresses. It is a particularly appropriate approach for a clinical trial in a rare disease and is a way of statistically increasing the power of a clinical trial in a small patient population when used to incorporate auxiliary information such as historical data, or data that are being accumulated as the trial progresses. Importantly, it has been accepted by regulatory agencies in such cases. Below are the results of the Bayesian analysis of patient data from cohorts treated at $1.8x10^{14}$ total vg and $1.2x10^{14}$ total vg. As seen in the table, the analysis confirmed both the natural history data of an 8-point decline in the MFM32 total percent score per year, and importantly, that patients treated with $1.8x10^{14}$ total vg experienced an arrest of disease progression that was statistically significant. The Bayesian analysis confirms the positive findings that were seen with the frequentist approach.

Bayesian Methodology

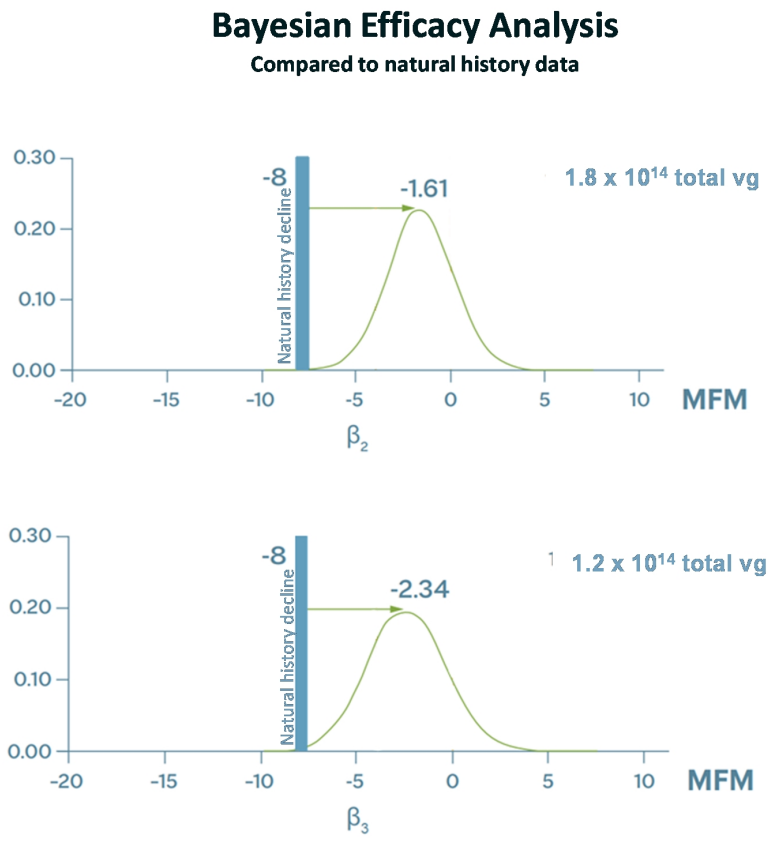


	Bayesian Analysis		Frequentist Analysis		
	Mean	Std Dev	Estimate	Std Error	p-Value
Post infusion: $1.8x10^{14}$ total vg	7.78	1.94	7.78	1.89	<0.001
Post infusion: $1.2x10^{14}$ total vg	6.09	2.11	6.07	2.05	0.004
Natural history decline	-8.19	0.74	-8.18	0.72	<0.001

As shown below, the Bayesian efficacy analysis confirmed that TSHA-120 halted patients' pre-treatment rate of decline when compared to individual historical data. As shown on these graphs, the 1.8x10^{14} total vg dose halted patient pre-treatment rate of decline with an average annual slope improvement of 7.78 points while the 1.2x10^{14} total vg dose resulted in a clinically meaningful slowing of disease progression with an average annual slope improvement of 6.09 points. These results are consistent with a dose response relationship.



Further analyses confirmed that there was a nearly 100% probability of clinically meaningful slowing of disease progression. As shown below, the 1.8x10^{14} total vg dose confirmed a virtually 100% probability of clinically meaningful slowing of disease compared to natural history decline of GAN patients while the 1.2x10^{14} total vg dose confirmed an approximately 85% probability of clinically meaningful slowing of disease and a virtually 100% probability of any slowing of disease.

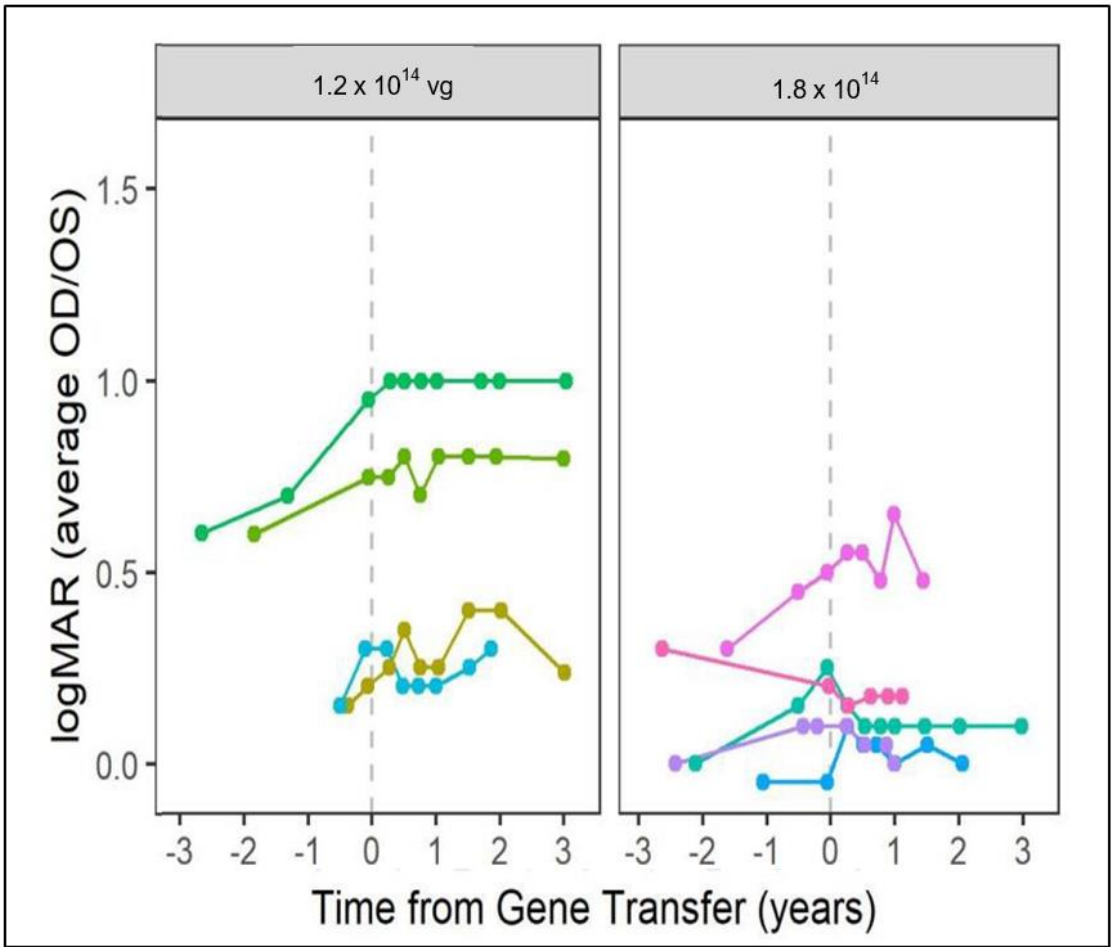


X-axis = annual decline in MFM32 total % score
Blue line = natural history decline (-8 points per year)

	Values = % Probability	
Change in disease progression	**1.8x10^{14} total vg**	**1.2x10^{14} total vg**
Any Slowing	99.9	99.8
Clinically meaningful slowing 50% or more	98.3	84.9

Data from eleven GAN patients were analyzed for visual acuity via the Logarithm of the Minimum Angle of Resolution (LogMAR). A dose-dependent trend towards stabilization of visual acuity, i.e., a slowed increase in LogMAR values, was observed

and appeared to be independent of visual acuity at the time of treatment. This newly obtained GAN exploratory endpoint showed improvement in visual acuity as shown below.



Currently in the GAN program, we have up to six years of longitudinal data in individual patients and collectively 55-patient years of clinical safety and efficacy data from our ongoing clinical study with no drug-related serious adverse events, no signs of acute or subacute inflammation, no sudden sensory changes and no drug-related or persistent elevation of transaminases.

In September 2021, we submitted a request for an end-of-Phase meeting with an ex-US regulatory agency for TSHA-120 and have a preliminary meeting date in January 2022. Additional regulatory submissions are expected by the end of 2021.

We anticipate safety and functional clinical data for TSHA-120 from the highest dose cohort of $3.5x10^{14}$ total vg in GAN in December 2021, with continued clinically meaningful slowing of disease progression similar to that achieved with the lower dose cohorts would be considered confirmatory of disease modification.

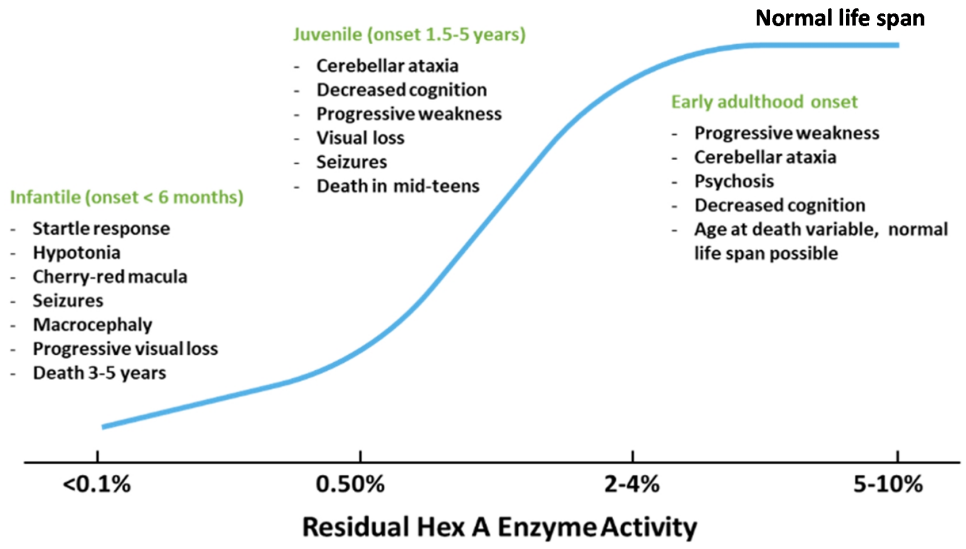
TSHA-101 for GM2 Gangliosidosis

GM2 gangliosidosis, which comprises Tay-Sachs disease and Sandhoff disease, refers to a group of lysosomal storage disorders caused by accumulation of the GM2 ganglioside in the lysosomes of cells within the CNS. Gangliosides are lipid components of cell membranes particularly abundant in the plasma membranes of neurons. Accumulation of GM2 ganglioside is caused by a deficiency in the Hex A enzyme, which is responsible for hydrolysis, or breakdown, of the GM2 ganglioside. This accumulation results in lysosomal rupture, leading to a poorly understood inflammatory cascade that leads to neuronal cell death and neurodegeneration. The global incidence of GM2 gangliosidosis is approximately one per 150,000 live births. Approximately 80% to

85% of patients are diagnosed with an infantile form of GM2 gangliosidosis, with the remainder diagnosed with a juvenile or early-adulthood form of the disease. There are no approved therapies for the treatment of GM2 gangliosidosis, and care is generally palliative. Children diagnosed with GM2 gangliosidosis appear normal at birth but experience rapid neurodegeneration, culminating in death before the age of four, and patients with juvenile GM2 gangliosidosis rarely survive beyond their mid-teens. The estimated prevalence of GM2 gangliosidosis is 500 patients in the United States and European Union.

The Hex A enzyme is a heterodimer composed of two subunits: ß-hexosaminidase a (encoded in humans by the *HEXA* gene) and ß-hexosaminidase ß (encoded in humans by the *HEXB* gene). GM2 gangliosidosis caused by a mutation of the *HEXA* gene is termed Tay-Sachs disease, while Sandhoff disease is caused by a mutation of the *HEXB* gene. Tay-Sachs disease and Sandhoff disease result in clinically indistinguishable phenotypes for which there is no effective treatment. As illustrated in the graphic below, in GM2 gangliosidosis, its most common and severe form, the disease is characterized by a lack of Hex A enzyme activity, while juvenile GM2 gangliosidosis is characterized by Hex A enzyme activity that is 0.5% to less than 2% of normal activity. Adult-onset GM2 gangliosidosis patients have Hex A enzyme activity levels typically in the range of 2% to 4% of normal Hex A activity and may live a normal lifespan. We believe that the "critical threshold" for normal hydrolysis of GM2 ganglioside is estimated to be 5% to 10% of normal Hex A activity.

Residual Hex A Enzyme Activity Determines Severity of GM2 Gangliosidosis



We believe that successful gene therapy to treat Tay-Sachs disease or Sandhoff disease requires expression of the α and ß subunits in a 1:1 ratio to ensure that Hex A expression confers a therapeutic benefit. An imbalanced expression of either subunit could result in the formation of a dysfunctional homodimer, or identical proteins, which would limit the efficacy of the therapy. Several therapeutic approaches utilize single vectors encoding either the α or ß subunit, while other approaches have utilized multiple vectors carrying the *HEXA* and *HEXB* genes separately. However, these approaches either fail to deliver the Hex A subunits in the appropriate ratio or require the simultaneous transduction of cells to achieve efficacy.

Similar to other lysosomal enzymes, Hex A is ubiquitously expressed and therefore concerns related to off-target effects or overexpression are limited. In addition, Hex A is secreted from transduced cells and can be taken up by neighboring cells to correct their phenotype, making it possible to cure these diseases without the need to transduce every cell, a process referred to as cross-correction. Studies suggest that restoring Hex A enzyme levels to approximately 10% of normal may result in complete phenotypic absence of the disease.

Our Solution: TSHA-101

We are developing TSHA-101, a neurodegenerative product candidate, for the treatment of GM2 gangliosidosis. TSHA-101 is a bicistronic, or dual loci of transcription, *HEXB*P2A- *HEXA* transgene packaged into an AAV9 vector under the control of the CAG promoter. We have designed TSHA-101 to link the human *HEXA* and *HEXB* genes, utilizing a cleavable peptide linker, to ensure that the expression of each the subunit occurs simultaneously at the appropriate 1:1 ratio. This approach is designed to maximize the expression of Hex A enzyme while minimizing the required therapeutic dosage.

Because GM2 gangliosidosis is clinically well defined, we believe we can leverage that knowledge to develop TSHA-101 with a higher probability of clinical and regulatory success. If approved, we believe that TSHA-101 could have a transformational impact on these severely underserved patients and their families. As TSHA-101 is designed to secrete the Hex A enzyme from transduced cells, uptake of the enzyme by neighboring cells via cross-correction has the potential to result in therapeutic benefit independent of their transduction status. In addition, we believe Hex A enzyme activity in the serum and CSF can serve as a potential biomarker to detect and help verify treatment effects on GM2 gangliosidosis during the early stages of clinical development.

We have received orphan drug designation and rare pediatric disease designation from the FDA and orphan drug designation from the European Commission for TSHA-101 for the treatment of GM2 gangliosidosis.

Based on natural history data, 2% to 4% Hex A enzyme activity in plasma normalizes survival and significantly improves the clinical phenotype of GM2 gangliosidosis. We expect preliminary clinical safety data and HEX A enzyme activity in plasma and CSF for TSHA-101 in GM2 gangliosidosis in December 2021, where Hex A enzyme activity level of at least 5% would be considered disease modifying based on natural history data. Due to severity of the disease and unmet medical need, we are currently assessing the need for a clinical trial of TSHA-101 in the United States to support a regulatory filing.

TSHA-121 for CLN7 Disease

The first-generation construct for the CLN7 program was developed in the laboratory of Steven Gray, Ph.D., Associate Professor at UT Southwestern Medical Center and our Chief Scientific Advisor with financial support from Mila's Miracle and Batten Hope, the leading CLN7 patient advocacy groups. The CLN7 program is currently in a Phase 1 clinical proof-of-concept trial run by UT Southwestern, and we expect the availability of preliminary clinical data for the first-generation construct by December 2021, including preliminary clinical safety data for the first patient in history to be intrathecally dosed at $1.0x10^{15}$ total vg. We expect completion of a next-generation construct by year-end 2021 with initiation of a planned pivotal trial in 2022 using the next-generation construct with reference to the human proof-of-concept clinical data from the first-generation construct. The next-generation construct is expected to improve potency, safety profile, packaging efficiency and manufacturability over the first-generation construct. In addition, we have provided a grant to Batten Hope to support patient awareness, disease education and newborn screening initiatives. CLN7 disease is a rare, fatal and rapidly progressive neurodegenerative disease that is a form of Batten disease. CLN7 is caused by autosomal recessive mutations in the MFSD8 gene that results in lysosomal dysfunction. Disease onset occurs around two to five years of age, with death often ensuing in young adolescence. Patients experience gradual nerve cell loss in certain parts of the brain and typically present with seizures, vision loss, speech impairment and mental and motor regression. Currently, there are no approved therapies to treat CLN7 disease, which impacts an estimated 4,000 patients globally. Preclinical data in rodents supported advancement of the first-generation construct into a Phase 1 clinical proof-of-concept study in patients with CLN7 disease. In an in vivo efficacy study, intrathecal (IT) administration of the first-generation construct to MFSD8 knockout mice with high or low doses resulted in clear age and dose effects with early intervention and high dose achieving the best therapeutic benefits. IT high dose of the first-generation construct in younger knockout mice resulted in: 1) widespread MFSD8 mRNA expression in all tissues assessed; 2) nearly complete normalization of impaired open field and rotarod performance at 6 and 9 months post injection; 3) more than doubled median life expectancy (16.82 months versus 7.77 months in untreated knockout mice); and 4) maintained healthy body weight for a prolonged period of time. Toxicology studies in wild type rodents demonstrated safety and tolerability of IT administration of the first-generation construct.

TSHA-118 for CLN1 Disease

CLN1 disease (one of the forms of Batten disease), a lysosomal storage disorder, is a progressive, fatal neurodegenerative disease with early childhood onset that has an estimated incidence of approximately 1 in 138,000 live births worldwide. The estimated prevalence of CLN1 disease is 900 patients in the United States and European Union. CLN1 disease is caused by loss-of-function mutations in the CLN1 gene that encodes the enzyme palmitoyl-protein thioesterase-1, or PPT1, a small glycoprotein involved in the degradation of certain lipid-modified proteins. Loss of function mutations in the CLN1 gene causes accumulation of these lipid-modified proteins in cells, eventually leading to aggregation, neuronal cellular dysfunction and ultimately neuronal cell death.

In the infantile-onset form of CLN1 disease, clinical symptoms appear between six to 24 months and include rapid deterioration of speech and motor function, refractory epilepsy, ataxia and visual failure. Infantile-onset CLN1 patients are typically

poorly responsive by five years of age and remain noncommunicative until their death, which usually occurs by seven years of age. Late-infantile-onset CLN1 disease begins between two to four years of age with initial visual and cognitive decline followed by the development of ataxia and myoclonus, or quick, involuntary muscle jerks. Juvenile-onset CLN1 disease patients present between the ages of five to ten years old, with vision loss as a first symptom followed by cognitive decline, seizures and motor decline. Approximately 60% of the children diagnosed with CLN1 disease in the United States present with early-onset infantile forms, with the remaining 40% experiencing later-onset childhood forms.

All currently available therapeutic approaches for patients with CLN1 disease are targeted towards the treatment of symptoms, and no disease-modifying therapies have been approved. Gene therapy has shown promise in correcting forms of neuronal ceroid lipofuscinoses, or NCL, diseases that involve mutations in soluble enzymes, in part, due to cross-correction of neighboring non-transduced cells.

We believe that the introduction of a functional *CLN1* gene using an AAV9 vector delivered intrathecally to the CNS offers the potential of a disease-modifying therapeutic approach for this disease. TSHA-118 is a self-complementary AAV9 viral vector that expresses human codon-optimized CLN1 complementary deoxyribonucleic acid under control of the chicken ß-actin hybrid promoter. We acquired exclusive worldwide rights to certain intellectual property rights and know-how relating to the research, development and manufacture of TSHA-118 (formerly ABO-202) in August 2020 pursuant to a license agreement with Abeona Therapeutics Inc., or Abeona.

TSHA-118 has been granted orphan drug designation, rare pediatric disease designation and fast track designation from the FDA and orphan drug designation from the European Medicines Agency for the treatment of CLN1 disease.

There is currently an open IND for the CLN1 program. We submitted an additional CTA filing for TSHA-118 and expect to initiate of a Phase 1/2 clinical trial by year-end 2021 and report preliminary clinical safety and PPT1 enzyme activity data in the first half of 2022.

TSHA-102 for Rett Syndrome

TSHA-102, a neurodevelopmental disorder product candidate, is being developed for the treatment of Rett syndrome, one of the most common genetic causes of severe intellectual disability, characterized by rapid developmental regression and in many cases caused by heterozygous loss of function mutations in MECP2, a gene essential for neuronal and synaptic function in the brain. We designed TSHA-102 to prevent gene overexpression-related toxicity by inserting microRNA, or miRNA target binding sites into the 3’ untranslated region of viral genomes. This overexpression of MECP2 is seen in the clinic in patients with a condition known as MECP2 duplication syndrome, where elevated levels of MECP2 result in a clinical phenotype similar to Rett syndrome both in terms of symptoms and severity. TSHA-102 is constructed from a neuronal specific promoter, MeP426, coupled with the miniMECP2 transgene, a truncated version of MECP2, and miRNA-Responsive Auto-Regulatory Element, or miRARE, our novel miRNA target panel, packaged in self-complementary AAV9.

In May 2021, preclinical data from the ongoing natural history study for TSHA-102 were published online in Brain, a highly esteemed neurological science peer-reviewed journal. The preclinical study was conducted by the UT Southwestern Medical Center (UT Southwestern) laboratory of Sarah Sinnett, Ph.D., and evaluated the safety and efficacy of regulated miniMECP2 gene transfer, TSHA-102 (AAV9/miniMECP2-miRARE), via intrathecal (IT) administration in adolescent mice between four and five weeks of age. TSHA-102 was compared to unregulated full length MECP2 (AAV9/MECP2) and unregulated miniMECP2 (AAV9/miniMECP2).

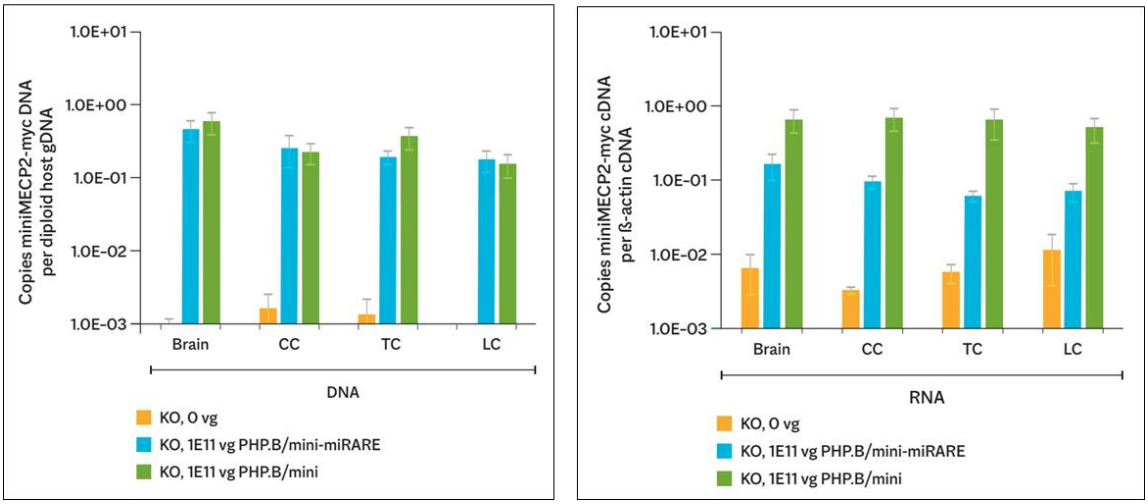
TSHA-102 extended knockout survival by 56% via IT delivery. In contrast, the unregulated miniMECP2 gene transfer failed to significantly extend knockout survival at either dose tested. Additionally, the unregulated full-length MECP2 construct did not demonstrate a significant extension in survival and was associated with an unacceptable toxicity profile in wild type mice.

In addition to survival, behavioral side effects were explored. Mice were subjected to phenotypic scoring and a battery of tests including gait, hindlimb clasping, tremor and others to comprise an aggregate behavioral score. miRARE attenuated miniMECP2-mediated aggravation in wild type aggregate phenotype severity scores. Mice were scored on an aggregate severity scale using an established protocol. AAV9/MECP2- and AAV9/miniMECP2-treated wild type mice had a significantly higher mean (worse) aggregate behavioral severity score versus that observed for saline-treated mice ($p < 0.05$; at 6–30 and 7–27 weeks of age, respectively). TSHA-102-treated wild type mice had a significantly lower (better) mean aggregate severity score versus those of AAV9/MECP2- and AAV9/miniMECP2-treated mice at most timepoints from 11–19 and 9–20 weeks of age, respectively. No significant difference was observed between saline- and TSHA-102-treated wild type mice.

miRARE-mediated genotype-dependent gene regulation was demonstrated by analyzing tissue sections from wild type and knockout mice treated with AAV9 vectors given intrathecally. When knockout mice were injected with a vector expressing the mini-

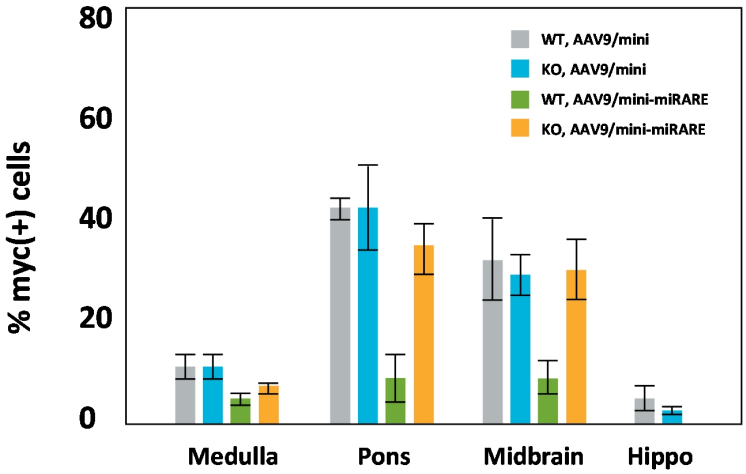
MECP2 transgene with and without the miRARE element, miRARE reduced overall miniMECP2 transgene expression compared to unregulated miniMECP2 in wild type mice as shown below.

miRARE Reduced Overall Expression of Mini*MeCP2* Transgene Expression Compared to Unregulated Mini*MeCP2* in WT Mice

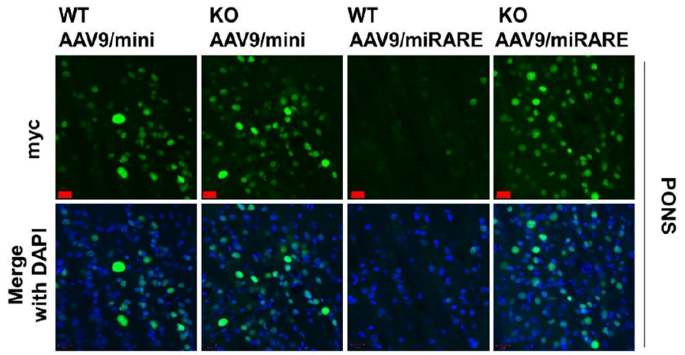


TSHA-102 demonstrated regulated expression in different regions of the brain. As shown in the graph and photos below, in the pons and midbrain, miRARE inhibited mean MECP2 gene expression in a genotype-dependent manner as indicated by significantly fewer myc(+) cells observed in wild type mice compared to knockout mice ($p<0.05$), thereby demonstrating that TSHA-102 achieved MECP2 expression levels similar to normal physiological parameters.

miRARE Inhibited Regulation of Mean MECP2 Gene Expression in a Genotype-Dependent Manner in Different Regions of the Brain



Treatment with TSHA-102 Resulted in Significantly Fewer Cells Demonstrating Expression in the Pons and Midbrain in WT Mice Compared to KO Mice



In preclinical animal models, intrathecal myc-tagged TSHA-102 was not associated with early death and did not cause adverse behavioral side effects in wild type mice demonstrating appropriate downregulation of miniMECP2 protein expression as compared to unregulated MECP2 gene therapy constructs.

In addition, preclinical data demonstrated that miRARE reduced overall expression of miniMeCP2 transgene expression and regulated genotype-dependent myc-tagged miniMECP2 expression across different brain regions on a cell-by-cell basis and improved the safety of TSHA-102 without compromising efficacy in juvenile mice. Recently obtained pharmacology data demonstrated improvement in survival, and respiratory and motor functions in disease relevant mouse models. Finally, preliminary data from a GLP toxicology study in non-human primates demonstrated no adverse findings at the highest dose tested suggesting that the miRARE platform is successfully downregulating MECP2 expression to within normal physiological levels. We have received orphan drug designation and rare pediatric disease designation from the FDA and orphan drug designation from the European Commission for TSHA-102 for the treatment of Rett syndrome.

We intend to submit an IND / CTA for TSHA-102 in November 2021, initiate a Phase 1/2 clinical trial by the end of 2021 and expect to report preliminary clinical data by the end of 2022.

TSHA-105 for SLC13A5 Deficiency

We are developing TSHA-105 for the treatment of SLC13A5 deficiency, a rare autosomal recessive epileptic encephalopathy characterized by the onset of seizures within the first few days of life. The estimated prevalence of SLC13A5 deficiency is 1,900 patients in the United States and European Union. Affected children have impairments in gross motor function and speech production with relative preservation of fine motor skills and receptive speech. SLC13A5 deficiency is caused by bi-allelic loss-of function mutations in the *SLC13A5* gene, which codes for a sodium dependent citrate transporter, or NaCT, that is largely expressed in the brain and liver. To date, all tested mutations result in no or a greatly reduced amount of the citrate in the cells.

Diminished NaCT function leads to loss of neuronal uptake of citrate and other metabolites such as succinate that are critical to brain energy metabolism and function. Currently, there are no approved therapies for SLC13A5 deficiency, and treatment is largely to address symptoms.

We are developing TSHA-105 as a gene replacement therapy for SLC13A5 deficiency. TSHA-105 is constructed from a codon-optimized human *SLC13A5* gene packaged in a self-complementary AAV9 capsid.

We have received orphan drug designation and rare pediatric disease designation from the FDA and orphan drug designation from the European Commission for TSHA-105 for the treatment of epilepsy caused by caused by SLC13A5 deficiency.

Angelman Syndrome Program – Two Approaches

We are pursuing two treatment strategies for the treatment of Angelman syndrome, a neurodevelopmental disorder caused by a maternal deficiency of the *UBE3A* gene. Angelman syndrome is characterized by profound developmental delay, ataxia and gait disturbance, sleep disorder, seizures, heightened anxiety and aggression and severe speech impairments. Angelman syndrome affects approximately one per 12,000 to 20,000 patients worldwide. The estimated prevalence of Angelman syndrome is 55,000 patients in the United States and European Union. There are currently no approved treatments for Angelman syndrome. Current treatment focuses on supportive care and managing medical and developmental issues.

Angelman syndrome is an imprinting disorder in which the maternal gene is deficient and the paternal copy of *UBE3A* is intact but silenced by a long non-coding RNA, *UBE3A* antisense transcript, or *UBE3A*-ATS. Delivery of an ASO targeting UBE3A-ATS showed promising results in ameliorating Angelman syndrome symptoms in a transgenic mouse model.

There are two approaches to treat this genetic abnormality. Our *UBE3A* gene replacement therapy is a cerebrospinal fluid-delivered AAV vector enabling dual isoform UBE3A expression for the treatment of Angelman syndrome. The novel construct, which was originally developed in the laboratories of Dr. Ben Philpot and Taysha's Chief Scientific Advisor, Dr. Steven Gray, packages both short and long isoforms of UBE3A into a single viral vector, which is expected to confer significant advantages over approaches that express only one of the isoforms. Expression of the short and long isoforms occurs in a 3:1 ratio which recapitulates natural human UBE3A isoform levels. In preclinical mouse models of Angelman syndrome, AAV-mediated *UBE3A* gene replacement recapitulated endogenous UBE3A isoform expression and UBE3A subcellular expression in neurons. Anatomical and behavioral phenotypes, including nest building, motor performance and seizure phenotypes, were recovered following treatment, providing proof-of-concept preclinical data supporting further study of *UBE3A* gene replacement therapy as a potentially safe and effective treatment for Angelman syndrome. These preclinical data were published in the *Journal of Clinical Investigation Insight* (*JCI Insight*) in October 2021.

Our other approach is a vectorized knockdown approach to unsilence the paternal copy of the UBE3A gene by targeting the antisense transcript responsible for silencing the gene. Our gene therapy targets the *UBE3A*-ATS transcript through shRNA knock-down with an AAV-based strategy to achieve broad distribution of the shRNA expression cassette across the entire CNS following a single intrathecal dose.

We believe both the gene replacement and RNA-mediated knockdown strategies position Taysha as a world-leader in the discovery of treatments for Angelman syndrome.

License Agreements

Research, Collaboration and License Agreement with The University of Texas Southwestern Medical Center

In November 2019, we entered into a research, collaboration and license agreement, or the UT Southwestern Agreement with The Board of Regents of the University of Texas System on behalf of UT Southwestern, as amended in April 2020.

In connection with the UT Southwestern Agreement, we obtained an exclusive, worldwide, royalty-free license under certain patent rights of UT Southwestern and a non-exclusive, worldwide, royalty-free license under certain know-how of UT Southwestern, in each case to make, have made, use, sell, offer for sale and import licensed products for use in certain specified indications. Additionally, we obtained a non-exclusive, worldwide, royalty-free license under certain patents and know-how of UT Southwestern for use in all human uses, with a right of first refusal to obtain an exclusive license under certain of such patent rights and an option to negotiate an exclusive license under other of such patent rights. We are required to use commercially reasonable efforts to develop, obtain regulatory approval for, and commercialize at least one licensed product.

In connection with the entry into the UT Southwestern Agreement, we issued to UT Southwestern 2,179,000 shares of our common stock. We do not have any future milestone or royalty obligations to UT Southwestern under the UT Southwestern Agreement, other than costs related to the maintenance of patents.

License Agreement with Queen's University

In February 2020, we entered into a license agreement, or the Queen's University Agreement with Queen's University. In connection with the Queen's University Agreement, we obtained an exclusive, perpetual, worldwide, royalty-bearing license, with the right to grant sublicenses, under certain patent rights and know-how of Queen's University, including certain improvements to the foregoing, to make, have made, use, offer for sale, sell and import licensed products and otherwise exploit such patents and know-how for use in certain specified indications. We also obtained an exclusive right of first negotiation to license certain next generation technology and improvements of Queen's University that do not constitute an already-licensed improvement to the licensed technology.

In connection with the Queen's University Agreement, we paid Queen's University a one-time fee of $3.0 million as an upfront fee and approximately $0.2 million to reimburse Queen's University for certain plasmid production costs. We are obligated to pay Queen's University up to $10.0 million in the aggregate upon achievement of certain regulatory milestones and up to $10.0 million in the aggregate upon achievement of certain commercial milestones, a low single digit royalty on net sales of licensed products, subject to certain customary reductions, and a percentage of non-royalty sublicensing revenue ranging in the low double digits. Royalties are payable on a licensed product-by-licensed product basis and country-by-country basis until expiration of the last valid claim of a licensed patent covering such licensed product in such country and the expiration of any regulatory exclusivity for such licensed product in such country. Additionally, we are obligated to pay Queen's University a low double-digit portion of any amounts received by us in connection with the sale of a priority review voucher related to a licensed product, not to exceed a low eight-figure amount.

In connection with a separate research grant agreement with Queen's University, we reimbursed Queen's University for certain manufacturing production costs totaling $3.8 million in fiscal year 2020.

License Agreement with Abeona (CLN1 Disease)

In August 2020, we entered into a license agreement, or the Abeona CLN1 Agreement, with Abeona Therapeutics Inc., or Abeona. In connection with the Abeona CLN1 Agreement, we obtained an exclusive, worldwide, royalty-bearing license, with the right to grant sublicenses under certain patents, know-how and materials originally developed by the University of North Carolina at Chapel Hill and Abeona to research, develop, manufacture, have manufactured, use, and commercialize licensed products for gene therapy for the prevention, treatment, or diagnosis of CLN1 Disease (one of the forms of Batten disease) in humans.

In connection with the license grant, we paid Abeona a one-time upfront license fee of $3.0 million during fiscal year 2020. We are obligated to pay Abeona up to $26.0 million in regulatory-related milestones and up to $30.0 million in sales-related milestones per licensed product and high single-digit royalties on net sales of licensed products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the latest of the expiration or revocation or complete rejection of the last licensed patent covering such licensed product in the country where the licensed product is sold, the loss of market exclusivity in such country where the product is sold, or, if no licensed product exists in such country and no market exclusivity exists in such country, ten years from first commercial sale of such licensed product in such country. In addition, concurrent with the Abeona CLN1 Agreement we entered into a purchase and reimbursement agreement with Abeona, pursuant to which we purchased specified inventory from Abeona and reimbursed Abeona for certain research and development costs previously incurred for total consideration of $4.0 million paid in fiscal year 2020.

The Abeona CLN1 Agreement expires on a country-by-country and licensed product-by-licensed product basis upon the expiration of the last royalty term of a licensed product. Either party may terminate the agreement upon an uncured material breach of the agreement or insolvency of the other party. We may terminate the agreement for convenience upon specified prior written notice to Abeona.

License Agreement with Abeona (Rett Syndrome)

In October 2020, we entered into a license agreement, or the Abeona Rett Agreement with Abeona pursuant to which we obtained an exclusive, worldwide, royalty-bearing license, with the right to grant sublicenses under certain patents, know-how and materials originally developed by the University of North Carolina at Chapel Hill, the University of Edinburgh and Abeona to research, develop, manufacture, have manufactured, use, and commercialize licensed products for gene therapy and the use of related transgenes for Rett syndrome.

Subject to certain obligations of Abeona, we are required to use commercially reasonable efforts to develop at least one licensed product and commercialize at least one licensed product in the United States.

In connection with the Abeona Rett Agreement, we paid Abeona a one-time upfront license fee of $3.0 million during fiscal year 2020. We are obligated to pay Abeona up to $26.5 million in regulatory-related milestones and up to $30.0 million in sales-related milestones per licensed product and high single-digit royalties on net sales of licensed products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the latest of the expiration or revocation or complete rejection of the last licensed patent covering such licensed product in the country where the licensed product is sold, the loss of market exclusivity in such country where the product is sold, or, if no licensed product exists in such country and no market exclusivity exists in such country, ten years from first commercial sale of such licensed product in such country.

The Abeona Rett Agreement expires on a country-by-country and licensed product-by-licensed product basis upon the expiration of the last royalty term of a licensed product. Either party may terminate the agreement upon an uncured material breach of the agreement or insolvency of the other party. We may terminate the agreement for convenience.

Impact of COVID-19 on Our Business

We have been actively monitoring the COVID-19 situation and its impact globally. Our financial results for the nine months ended September 30, 2021 were not impacted by COVID-19. We believe the remote working arrangements and travel restrictions imposed by various governmental jurisdictions have had limited impact on our ability to maintain internal operations during the nine months ended September 30, 2021. The extent to which COVID-19 may impact our business and operations will depend on future developments that are highly uncertain and cannot be predicted with confidence, such as the duration of the outbreak, the effectiveness of actions to contain and treat COVID-19, the efficacy, availability and adoption of vaccines, both domestically and globally, and the impact of new variants or mutations of the coronavirus, such as the Delta variant. Although we have not experienced any material business shutdowns or interruptions due to the COVID-19 pandemic, we cannot predict the scope and severity of any potential business shutdowns or disruptions in the future, including to our planned clinical trials and preclinical studies. Any such shutdowns or other business interruptions could result in material and negative effects to our ability to conduct our business in the manner and on the timelines presently planned, which could have a material adverse impact on our business, results of operation and financial condition.

Components of Results of Operations

Revenue

To date, we have not recognized any revenue from any sources, including from product sales, and we do not expect to generate any revenue from the sale of products, if approved, in the foreseeable future. If our development efforts for our product candidates are successful and result in regulatory approval, or license agreements with third parties, we may generate revenue in the future from product sales. However, there can be no assurance as to when we will generate such revenue, if at all.

Operating Expenses

Research and Development Expenses

Research and development expenses primarily consist of preclinical development of our product candidates and discovery efforts, including conducting preclinical studies, manufacturing development efforts, preparing for clinical trials and activities related to regulatory filings for our product candidates. Research and development expenses are recognized as incurred and payments made prior to the receipt of goods or services to be used in research and development are capitalized until the goods or services are received. Costs incurred in obtaining technology licenses through asset acquisitions are charged to research and development expense if the licensed technology has not reached technological feasibility and has no alternative future use. Research and development expenses include or could include:

- employee-related expenses, including salaries, bonuses, benefits, stock-based compensation, other related costs for those employees involved in research and development efforts;
- license maintenance fees and milestone fees incurred in connection with various license agreements;
- external research and development expenses incurred under agreements with consultants, contract research organizations, or CROs, investigative sites and consultants to conduct our preclinical studies;

- costs related to manufacturing material for our preclinical studies and clinical trials, including fees paid to contract manufacturing organizations, or CMOs;
- laboratory supplies and research materials;
- costs related to compliance with regulatory requirements; and
- facilities, depreciation and other allocated expenses, which include direct and allocated expenses for rent, maintenance of facilities, insurance and equipment.

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We plan to substantially increase our research and development expenses for the foreseeable future as we continue the development of our product candidates and manufacturing processes and conduct discovery and research activities for our preclinical programs. We cannot determine with certainty the timing of initiation, the duration or the completion costs of current or future preclinical studies and clinical trials of our product candidates due to the inherently unpredictable nature of preclinical and clinical development. Clinical and preclinical development timelines, the probability of success and development costs can differ materially from expectations. We anticipate that we will make determinations as to which product candidates to pursue and how much funding to direct to each product candidate on an ongoing basis in response to the results of ongoing and future preclinical studies and clinical trials, regulatory developments and our ongoing assessments as to each product candidate's commercial potential. We will need to raise substantial additional capital in the future. Our clinical development costs are expected to increase significantly as we commence clinical trials. Our future expenses may vary significantly each period based on factors such as:

- expenses incurred to conduct preclinical studies required to advance our product candidates into clinical development;
- per patient trial costs, including based on the number of doses that patients received;
- the number of patients who enroll in each trial;
- the number of trials required for approval;
- the number of sites included in the trials;
- the countries in which the trials are conducted;
- the length of time required to enroll eligible patients;
- the drop-out or discontinuation rates of patients;
- potential additional safety monitoring requested by regulatory agencies;
- the duration of patient participation in the trials and follow-up;
- the phase of development of the product candidate;
- third-party contractors failing to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all;
- the ability to manufacture of our product candidates;
- regulators or institutional review boards, or IRBs requiring that we or our investigators suspend or terminate clinical development for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks; and
- the efficacy and safety profile of our product candidates.

General and Administrative Expenses

General and administrative expenses consist or will consist principally of salaries and related costs for personnel in executive and administrative functions, including stock-based compensation, travel expenses and recruiting expenses. Other general and administrative expenses include professional fees for legal, consulting, accounting and audit and tax-related services and insurance costs.

We anticipate that our general and administrative expenses will increase in the future as we increase our headcount to support our expanded infrastructure, as well as the initiation and continuation of our preclinical studies and clinical trials for our product

candidates. We also anticipate that our general and administrative expenses will increase as a result of payments for accounting, audit, legal, consulting services, as well as costs associated with maintaining compliance with Nasdaq listing rules and SEC requirements, director and officer liability insurance, investor and public relations activities and other expenses associated with operating as a public company. We anticipate the additional costs for these services will increase our general and administrative expenses by between $6.0 million and $7.0 million on an annual basis, including the cost of director and officer liability insurance.

Results of Operations

Results of Operations for the Three Months ended September 30, 2021 and 2020

The following table summarizes our results of operations for the three months ended September 30, 2021 and 2020 (in thousands):

	For the Three Months Ended September 30, 2021	For the Three Months Ended September 30, 2020
Operating expenses:		
Research and development	$ 39,528	$ 11,057
General and administrative	11,153	3,984
Total operating expenses	50,681	15,041
Loss from operations	(50,681)	(15,041)
Other income (expense):		
Interest income	37	—
Interest expense	(543)	(1)
Total other expense, net	(506)	(1)
Net loss	$ (51,187)	$ (15,042)

Research and Development Expenses

Research and development expenses were $39.5 million for the three months ended September 30, 2021, compared to $11.1 million for the three months ended September 30, 2020. The increase of approximately $28.4 million was primarily attributable to an increase of $14.5 million of expenses incurred in research and development manufacturing and other raw material purchases, which included cGMP batches produced by Catalent and UT Southwestern. We incurred an increase in employee compensation expenses of $10.7 million, which included $1.9 million of non-cash stock-based compensation, and $4.9 million in third-party research and development expenses, which includes clinical trial CRO activities, GLP toxicology studies, and consulting for regulatory and clinical studies. This was partially offset by a decrease in licensing fees of $1.7 million.

General and Administrative Expenses

General and administrative expenses were $11.2 million for the three months ended September 30, 2021, compared to $4.0 million for the three months ended September 30, 2020. The increase of approximately $7.2 million was primarily attributable to $4.3 million of incremental compensation expense, which included $1.8 million of non-cash stock-based compensation. We also incurred an increase of $2.9 million mainly in professional fees related to legal, insurance, investor relations/communications, accounting, personnel recruiting, market research, and patient advocacy activities.

Results of Operations for the Nine Months ended September 30, 2021 and 2020

The following table summarizes our results of operations for the nine months ended September 30, 2021 and 2020 (in thousands):

	For the Nine Months Ended September 30, 2021	For the Nine Months Ended September 30, 2020
Operating expenses:		
Research and development	$ 94,025	$ 19,633
General and administrative	29,518	5,002
Total operating expenses	123,543	24,635
Loss from operations	(123,543)	(24,635)
Other income (expense):		
Change in fair value of preferred stock tranche liability	—	(17,030)
Interest income	143	—
Interest expense	(737)	(28)
Total other expense, net	(594)	(17,058)
Net loss	$ (124,137)	$ (41,693)

Research and Development Expenses

Research and development expenses were $94.0 million for the nine months ended September 30, 2021, compared to $19.6 million for the nine months ended September 30, 2020. The $74.4 million increase was primarily attributable to an increase of $29.7 million of expenses incurred in research and development manufacturing and other raw material purchases, which included cGMP batches produced by Catalent and UT Southwestern. We also incurred an increase in employee compensation and expenses of $24.4 million, which included $5.7 million of non-cash stock-based compensation. We also incurred an increase of $20.3 million of third-party research and development consulting fees, primarily related to GLP toxicology studies, clinical study CRO activities, and consulting for regulatory and clinical studies.

General and Administrative Expenses

General and administrative expenses were $29.5 million for the nine months ended September 30, 2021, compared to $5.0 million for the nine months ended September 30, 2020. The increase of approximately $24.5 million was primarily attributable to $13.2 million of incremental compensation expense, which included $6.2 million of non-cash stock-based compensation. We also incurred an increase of $11.3 million in professional fees related to legal, insurance, investor relations/communications, accounting, personnel recruiting, market research and patient advocacy activities.

Other Income (Expense)

Interest Expense

Interest expense for the three and nine months ended September 30, 2021 primarily consists of interest expense incurred under the Term Loan Agreement (as defined below).

Change in Fair Value of Preferred Stock Tranche Liability

On March 4, 2020, the Company entered into a purchase agreement (the “Series A Purchase Agreement”) providing for a private placement of up to 10,000,000 shares of Series A convertible preferred stock at an original issuance price of $3.00 per share, subject to separate closings, including: (1) 6,000,000 shares at the initial closing on March 4, 2020, and (2) 2,000,000 shares at each of two subsequent closings triggered by the achievement of specific clinical milestones. The Series A Purchase Agreement obligated the Company to issue and sell and the Series A investors to purchase up to a total of 4,000,000 additional shares of Series A convertible preferred stock (the “Milestone Shares”) at the same price per share upon the achievement of certain defined clinical milestones (the “tranche liability”). We determined that our obligation to issue, and the investors’ right to purchase, additional shares of Series A convertible preferred stock pursuant to the milestone closings represented a freestanding financial instrument, or the tranche liability. The tranche liability was initially recorded at fair value. We concluded that the tranche liability met the definition of a freestanding financial instrument, as it was legally detachable and separately exercisable from the initial closing of the Series A convertible preferred stock.

On June 30, 2020, ahead of the anticipated closing of the Series B convertible preferred stock financing at an original issuance price of $17.00 per share on July 2, 2020, certain Series A investors elected to exercise in full their options to purchase their pro-rata portion of the Milestone Shares prior to our achievement of the clinical milestones and purchased 200,000 shares of Series A

convertible preferred stock. We remeasured the fair value of the entire tranche liability at June 30, 2020, and recognized a non-cash expense of approximately $17.0 million.

Liquidity and Capital Resources

Overview

Since our inception, we have not generated any revenue and have incurred significant operating losses. As of September 30, 2021, we had cash, cash equivalents and restricted cash of $191.4 million. We have funded our operations primarily through equity financings, raising an aggregate of $307.0 million in gross proceeds from our initial public offering and private placements of convertible preferred stock. Specifically, between March and July 2020, we closed on the sale of an aggregate of 10,000,000 shares of Series A convertible preferred stock for gross proceeds of $30.0 million. In July and August 2020, we closed on the sale of an aggregate of 5,647,048 shares of Series B convertible preferred stock for gross proceeds of $96.0 million. In September 2020, we raised gross proceeds of $181.0 million in our initial public offering.

On August 12, 2021, or the Closing Date, we entered into a Loan and Security Agreement, or the Term Loan Agreement, with the lenders party thereto from time to time, or the Lenders and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders, or the Agent. The Term Loan Agreement provides for (i) on the Closing Date, $40.0 million aggregate principal amount of term loans available through December 31, 2021, (ii) from January 1, 2022 until September 30, 2022, an additional $20.0 million term loan facility available at the Company's option upon having three distinct and active clinical stage programs at the time of draw, (iii) from October 1, 2022 until March 31, 2023, an additional $20.0 million term loan facility available at our option upon having three distinct and active clinical stage programs at the time of draw and (iv) from April 1, 2023 until December 31, 2023, an additional $20.0 million term loan facility available upon approval by the Agent and the Lenders, or, collectively, the Term Loans. We drew $30.0 million in term loans on the Closing Date. The loan repayment schedule provides for interest only payments until August 31, 2024, followed by consecutive monthly payments of principal and interest. All unpaid principal and accrued and unpaid interest with respect to each term loan is due and payable in full on August 1, 2026.

Funding Requirements

To date, we have not generated any revenues from the commercial sale of approved drug products, and we do not expect to generate substantial revenue for at least the next few years. If we fail to complete the development of our product candidates in a timely manner or fail to obtain their regulatory approval, our ability to generate future revenue will be compromised. We do not know when, or if, we will generate any revenue from our product candidates, and we do not expect to generate significant revenue unless and until we obtain regulatory approval of, and commercialize, our product candidates. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development of, initiate clinical trials of and seek marketing approval for our product candidates, as well as build out of our cGMP manufacturing facility in Durham, North Carolina. In addition, if we obtain approval for any of our product candidates, we expect to incur significant commercialization expenses related to sales, marketing, manufacturing and distribution. Furthermore, we expect to incur additional costs associated with operating as a public company. We anticipate that we will need substantial additional funding in connection with our continuing operations. If we are unable to raise capital when needed or on attractive terms, we could be forced to delay, reduce or eliminate our research and development programs or future commercialization efforts.

We believe that our existing cash and cash equivalents, along with full access to the term loan facility, will enable us to fund our operating expenses and capital requirements into second half of 2023.

Because of the numerous risks and uncertainties associated with research, development and commercialization of biological products, we are unable to estimate the exact amount of our operating capital requirements. Our future funding requirements will depend on many factors, including, but not limited to:

- the scope, progress, costs and results of discovery, preclinical development, laboratory testing and clinical trials for TSHA-101, TSHA-118, TSHA-102, and TSHA-120 and any current and future product candidates that we advance;
- the extent to which we develop, in-license or acquire other product candidates and technologies in our gene therapy product candidate pipeline;

- the costs and timing of process development and manufacturing scale-up activities associated with our product candidates and other programs as we advance them through preclinical and clinical development;
- the number and development requirements of product candidates that we may pursue;
- the costs, timing and outcome of regulatory review of our product candidates;
- our headcount growth and associated costs as we expand our research and development capabilities and establish a commercial infrastructure;
- the costs of establishing and maintaining our own commercial-scale cGMP manufacturing facility;
- the costs and timing of future commercialization activities, including product manufacturing, marketing, sales, and distribution, for any of our product candidates for which we receive marketing approval;
- the costs and timing of preparing, filing and prosecuting patent applications, maintaining and enforcing our intellectual property rights and defending any intellectual property-related claims;
- the revenue, if any, received from commercial sales of our product candidates for which we receive marketing approval; and
- the costs of operating as a public company.

Identifying potential product candidates and conducting preclinical studies and clinical trials is a time-consuming, expensive and uncertain process that takes many years to complete, and we may never generate the necessary data or results required to obtain marketing approval and achieve product sales. In addition, our product candidates, if approved, may not achieve commercial success. Our commercial revenues, if any, will be derived from sales of product candidates that we do not expect to be commercially available in the near term, if at all. Accordingly, we will need to continue to rely on additional financing to achieve our business objectives. Adequate additional financing may not be available to us on acceptable terms, or at all. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the terms of these equity securities or this debt may restrict our ability to operate. The Term Loan Agreement contains negative covenants, including, among other things, restrictions on indebtedness, liens investments, mergers, dispositions, prepayment of other indebtedness and dividends and other distributions. Any future additional debt financing and equity financing, if available, may involve agreements that include covenants limiting and restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures, entering into profit-sharing or other arrangements or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may be required to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or to grant licenses on terms that may not be favorable to us.

We are continuing to assess the effect that the COVID-19 pandemic may have on our business and operations. The extent to which COVID-19 may impact our business and operations will depend on future developments that are highly uncertain and cannot be predicted with confidence, such as the duration of the outbreak, the duration and effect of business disruptions and the short-term effects and ultimate effectiveness of the travel restrictions, quarantines, social distancing requirements and business closures in the United States and other countries to contain and treat the disease, the efficacy, availability and adoption of vaccines, both domestically and globally, and the impact of new variants or mutations of the coronavirus, such as the Delta variant. While the potential economic impact brought by, and the duration of, the COVID-19 pandemic may be difficult to assess or predict, a continued and growing pandemic could result in significant disruption of global financial markets, reducing our ability to access capital, which could in the future negatively affect our liquidity. In addition, a recession or market correction resulting from the spread of COVID-19 could materially affect our business and the value of our common stock.

Cash Flows

The following table shows a summary of our cash flows for the nine months ended September 30, 2021 and 2020 (in thousands):

	For the Nine Months Ended September 30,	
	2021	2020
Net cash used in operating activities	$ (76,784)	$ (10,881)
Net cash used in investing activities	(13,034)	(3,031)
Net cash provided by financing activities	29,978	292,546
Net change in cash, cash equivalents and restricted cash	$ (59,840)	$ 278,634

Operating Activities

For the nine months ended September 30, 2021, our net cash used in operating activities of $76.8 million primarily consisted of a net loss of $124.1 million, primarily attributable to our spending on research and development expenses. The net loss of $124.1 million was partially offset by adjustments for non-cash items, primarily stock-based compensation of $13.2 million, and the add back of the up-front license fee of $5.5 million paid to HHF related to the acquisition of TSHA-120 which is treated as an investing outflow as well as other license fees of $1.3 million. The $124.1 million net loss was also partially offset by a $26.6 million increase in the cash provided by operating assets and liabilities, primarily resulting from an increase in accounts payable and accrued expenses.

For the nine months ended September 30, 2020 our net cash used in operating activities of $10.9 million primarily consisted of a net loss of $41.7 million, primarily attributable to our spending on research and development expenses. The net loss of $41.7 million was partially offset by changes in working capital of $6.4 million, which was primarily due to increases in accounts payable related to the Abeona clinical materials and development costs of $4.0 million, and $24.4 million in adjustments for non-cash items, primarily the change in the fair value of the preferred stock tranche liability of $17.0 million, the upfront payment to acquire the license rights pursuant to the Queen's University Agreement for $3.0 million, the upfront expense related to the Abeona CLN1 license agreement for $3.0 million, both of which were recorded as a component of research and development expenses, and stock-based compensation expense of $1.3 million.

Investing Activities

During the nine months ended September 30, 2021, investing activities used $13.0 million of cash primarily attributable to the up-front license fee payment of $5.5 million to acquire exclusive worldwide rights to TSHA-120, for the treatment of GAN, and capital expenditures related to our in-house manufacturing facility and office space. During the nine months ended September 30, 2020, investing activities used $3.0 million of cash attributable to the upfront payment to acquire the license rights pursuant to the Queen's University Agreement.

Financing Activities

During the nine months ended September 30, 2021, financing activities provided $30.0 million of cash, which is attributable to the receipt of $30.0 million net proceeds from our Term Loan with Silicon Valley Bank. During the nine months ended September 30, 2020, financing activities provided $292.5 million of cash, which was primarily attributable to the receipt of $167.2 million in net proceeds from our initial public offering, $95.8 million in net proceeds from the sale of our Series B convertible preferred stock and $29.6 million in net proceeds from the sale of our Series A convertible preferred stock.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the SEC.

Critical Accounting Policies and Significant Judgments and Estimates

There were no material changes to our critical accounting policies that are disclosed in our audited consolidated financial statements for the year ended December 31, 2020 filed with the SEC on March 3, 2021.

Recent Accounting Pronouncements

See Note 2 to our unaudited condensed consolidated financial statements located in "Part I – Financial Information, Item 1. Financial Statements" in this Quarterly Report on Form 10-Q for a description of recent accounting pronouncements applicable to our condensed consolidated financial statements.

Emerging Growth Company and Smaller Reporting Company Status

In April 2012, the Jumpstart Our Business Startups Act of 2012, or JOBS Act, was enacted. Section 107 of the JOBS Act provides that an "emerging growth company" can take advantage of the extended transition period provided in Section 7(a)(2)(B) of the Securities Act of 1933, as amended, for complying with new or revised accounting standards. Thus, an emerging growth company can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We elected

the extended transition period for complying with new or revised accounting standards, which delays the adoption of these accounting standards until they would apply to private companies.

In addition, as an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- an exception from compliance with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended;
- reduced disclosure about our executive compensation arrangements in our periodic reports, proxy statements and registration statements;
- exemptions from the requirements of holding non-binding advisory votes on executive compensation or golden parachute arrangements; and
- an exemption from compliance with the requirements of the Public Company Accounting Oversight Board regarding the communication of critical audit matters in the auditor's report on financial statements.

We may take advantage of these provisions until we no longer qualify as an emerging growth company. We will cease to qualify as an emerging growth company on the date that is the earliest of: (i) December 31, 2025, (ii) the last day of the fiscal year in which we have more than $1.07 billion in total annual gross revenues, (iii) the date on which we are deemed to be a "large accelerated filer" under the rules of the SEC, which means the market value of our common stock that is held by non-affiliates exceeds $700 million as of the prior June 30th, or (iv) the date on which we have issued more than $1.0 billion of non-convertible debt over the prior three-year period. We may choose to take advantage of some but not all of these reduced reporting burdens. We have taken advantage of certain reduced reporting requirements in this Quarterly Report on Form 10-Q and our other filings with the SEC. Accordingly, the information contained herein may be different than you might obtain from other public companies in which you hold equity interests.

We are also a "smaller reporting company," meaning that the market value of our shares held by non-affiliates is less than $700 million and our annual revenue was less than $100 million during the most recently completed fiscal year. We may continue to be a smaller reporting company if either (i) the market value of our shares held by non-affiliates is less than $250 million or (ii) our annual revenue was less than $100 million during the most recently completed fiscal year and the market value of our shares held by non-affiliates is less than $700 million. If we are a smaller reporting company at the time we cease to be an emerging growth company, we may continue to rely on exemptions from certain disclosure requirements that are available to smaller reporting companies. Specifically, as a smaller reporting company, we may choose to present only the two most recent fiscal years of audited financial statements in our Annual Report on Form 10-K and, similar to emerging growth companies, smaller reporting companies have reduced disclosure obligations regarding executive compensation.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

We are a smaller reporting company as defined by Rule 12b-2 of the Exchange Act and are not required to provide the information required under this Item.

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, has evaluated the effectiveness of our disclosure controls and procedures (as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act), as of the end of the period covered by this Form 10-Q. Based on such evaluation, our Chief Executive Officer and Chief Financial Officer have concluded that as of September 30, 2021, our disclosure controls and procedures were effective to provide reasonable assurance that the information required to be disclosed by us in this Form 10-Q was (a) reported within the time periods specified by SEC rules and regulations, and (b) communicated to our management, including our Chief Executive Officer and Chief Financial Officer, to allow timely decisions regarding any required disclosure.

Changes in Internal Control Over Financial Reporting

There were no changes in our internal control over financial reporting identified in management's evaluation pursuant to Rules 13a-15(d) or 15d-15(d) of the Exchange Act during the period covered by this Quarterly Report on Form 10-Q that materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Internal Controls

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, not absolute, 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 judgment in evaluating the benefits of possible controls and procedures relative to their costs. Our management, including our Chief Executive Officer and Chief Financial Officer, believes that our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives and are effective at the reasonable assurance level. However, our management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all errors and all fraud.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

We are not subject to any material legal proceedings. From time to time, we may be involved in various claims and legal proceedings relating to claims arising out of our operations. We are not currently a party to any legal proceedings that, in the opinion of our management, are likely to have a material adverse effect on our business. Regardless of outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 1A. Risk Factors.

Our business is subject to risks and events that, if they occur, could adversely affect our financial condition and results of operations and the trading price of our securities. In addition to the other information set forth in this quarterly report on Form 10-Q, you should carefully consider the factors described in Part I, Item 1A. "Risk Factors" of our Annual Report on Form 10-K for the fiscal year ended December 31, 2020, filed with the Securities and Exchange Commission on March 3, 2021. Other than as described below, **t**here have been no material changes to the risk factors described in that report.

Our existing indebtedness contains restrictions that potentially limit our flexibility in operating our business. In addition, we may be required to make a prepayment or repay our outstanding indebtedness earlier than we expect.

On August 12, 2021, we entered into a Loan and Security Agreement, or the Term Loan Agreement, with the lenders party thereto from time to time, or the Lenders, and Silicon Valley Bank, as administrative agent and collateral agent for the Lenders, or the Agent, which provides for term loans of up to $100.0 million in the aggregate available in four tranches. The Term Loan Agreement contains various covenants that limit our ability to engage in specified types of transactions. These covenants limit our ability to, among other things:

- incur or assume certain debt;
- merge or consolidate or acquire all or substantially all of the capital stock or property of another entity;
- change the nature of our business;
- change our organizational structure or type;
- license, transfer, or dispose of certain assets;
- grant certain types of liens on our assets;
- make certain investments;
- pay cash dividends; and
- enter into material transactions with affiliates.

A breach of any of these covenants could result in an event of default under the Term Loan Agreement. An event of default will also occur if, among other things, a material adverse change in our business, operations, or condition occurs, which could potentially include a material impairment of the prospect of our repayment of any portion of the amounts we owe under the Term Loan Agreement. In the case of a continuing event of default under the Term Loan Agreement, the lenders could elect to declare all amounts outstanding to be immediately due and payable, proceed against the collateral in which we granted the Lenders a security interest under the Term Loan Agreement, or otherwise exercise the rights of a secured creditor. Amounts outstanding under the Term Loan Agreement are secured by all of our existing and future assets, excluding intellectual property, which is subject to a negative pledge arrangement.

At closing, we drew on $30.0 million of the $40.0 million available to us as part of the first tranche. The Term Loan Agreement also gives us the ability to access an additional $60.0 million at our option, of which $40.0 million may be drawn in two additional tranches subject to the achievement of certain specified conditions and of which $20.0 million may be drawn in an additional tranche with the approval of the Agent and the Lenders. If we are unable to satisfy these or other required conditions, or if the Agent and Lenders do not consent, as applicable, we would not be able to draw down the remaining tranches of financing and may not be able to obtain alternative financing on commercially reasonable terms or at all, which could adversely impact our business.

We may not have enough available cash to repay or refinance our indebtedness at the time any such repayment is required. In such an event, we may be required to delay, limit, reduce, or terminate our preclinical and clinical product development or commercialization efforts or build out of our cGMP manufacturing facility or grant others rights to develop and market product

candidates that we would otherwise prefer to develop and market ourselves. Our business, financial condition, and results of operations could be materially adversely affected as a result.

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

(a) Recent Sales of Unregistered Equity Securities

None.

(b) Use of Proceeds

On September 23, 2020, our Registration Statement on Form S-1, as amended (File No. 333-248559), was declared effective in connection with our initial public offering, pursuant to which we sold an aggregate of 9,050,000 shares of our common stock for aggregate net proceeds of $165.9 million.

There has been no material change in the planned use of proceeds from our initial public offering as described in our prospectus filed pursuant to Rule 424(b)(4) under the Securities Act with the SEC on September 25, 2020.

(c) Issuer Purchases of Equity Securities

None.

Item 3. Defaults Upon Senior Securities.

Not applicable.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Other Information.

None.

Item 6. Exhibits.

The exhibits listed on the Exhibit Index are either filed or furnished with this report or incorporated herein by reference.

Exhibit Number	Description
3.1	Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K (File No. 001-39536), filed with the Securities and Exchange Commission on September 29, 2020).
3.2	Amended and Restated Bylaws (incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K (File No. 001-39536), filed with the Securities and Exchange Commission on September 29, 2020).
10.2	Loan and Security Agreement, dated August 12, 2021, by and among the Company, the lenders party thereto from time to time and Silicon Valley Bank, as administrative agent and collateral agent (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q (File No. 001-39536), filed with the Securities and Exchange Commission on August 16, 2021).
31.1*	Certification of Principal Executive Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
31.2*	Certification of Principal Financial Officer Pursuant to Rules 13a-14(a) and 15d-14(a) under the Securities Exchange Act of 1934, as Adopted Pursuant to Section 302 of the Sarbanes-Oxley Act of 2002.
32.1*#	Certification of Principal Executive Officer Pursuant to 18 U.S.C. Section 1350, as Adopted Pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2*#	Certification of Principal 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 - the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as inline XBRL and contained in Exhibit 101).

* Filed herewith.

\# These certifications are being furnished solely to accompany this quarterly report pursuant to 18 U.S.C. Section 1350, and are not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and are not to be incorporated by reference into any filing of the registrant, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

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.

Company Name

Date: November 10, 2021 By: /s/ RA Session II

RA Session II
President and Chief Executive Officer
(Principal Executive Officer)

Date: November 10, 2021 By: /s/ Kamran Alam

Kamran Alam
Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 31.1

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, RA Session II, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Taysha Gene Therapies, Inc.;

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

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

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) 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) 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

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

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

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

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

Date: November 10, 2021

By: /s/ RA Session II

RA Session II
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION PURSUANT TO
RULES 13a-14(a) AND 15d-14(a) UNDER THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Kamran Alam, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Taysha Gene Therapies, Inc.;

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

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

4. The registrant's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) 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) 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

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

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

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

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

Date: November 10, 2021

By: /s/ Kamran Alam

Kamran Alam
Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)

Exhibit 32.1

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

In connection with the Quarterly Report of Taysha Gene Therapies, Inc. (the "Company") on Form 10-Q for the period ending September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: November 10, 2021

By: /s/ RA Session II

RA Session II
President and Chief Executive Officer
(Principal Executive Officer)

Exhibit 32.2

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

In connection with the Quarterly Report of Taysha Gene Therapies, Inc. (the "Company") on Form 10-Q for the period ending September 30, 2021 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I certify, pursuant to 18 U.S.C. § 1350, as adopted pursuant to § 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and result of operations of the Company.

Date: November 10, 2021

By: /s/ Kamran Alam

Kamran Alam
Chief Financial Officer
(Principal Financial Officer and Principal Accounting Officer)