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 June 30, 2023

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: 001-39871

SAB BIOTHERAPEUTICS, INC.

(Exact Name of Registrant as Specified in its Charter)

Delaware	**85-3899721**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
2100 East 54th Street North Sioux Falls, South Dakota	**57104**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (605) 679-6980

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, $0.0001 par value per share	SABS	The Nasdaq Stock Market LLC
Warrants, each exercisable for one share of Common Stock at an exercise price of $11.50 per share	SABSW	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 ☒

Indicate by check mark whether the registrant has filed all documents and reports required to be filed by Sections 12, 13 or 15(d) of the Securities Exchange Act of 1934 subsequent to the distribution of securities under a plan confirmed by a court. Yes ☒ No ☐

As of July 31, 2023, the registrant had 52,319,156 shares of common stock, $0.0001 par value per share, outstanding.

Table of Contents

		Page
PART I.	FINANCIAL INFORMATION	2
Item 1.	Consolidated Financial Statements (Unaudited)	2
	Consolidated Balance Sheets	2
	Consolidated Statements of Operations	3
	Consolidated Statements of Changes In Stockholders' Equity	4
	Consolidated Statements of Cash Flows	5
	Notes to Unaudited Consolidated Financial Statements	6
Item 2.	Management's Discussion and Analysis of Financial Condition and Results of Operations	21
Item 3.	Quantitative and Qualitative Disclosures About Market Risk	34
Item 4.	Controls and Procedures	34
PART II.	OTHER INFORMATION	35
Item 1.	Legal Proceedings	35
Item 1A.	Risk Factors	35
Item 2.	Unregistered Sales of Equity Securities and Use of Proceeds	35
Item 3.	Defaults Upon Senior Securities	35
Item 4.	Mine Safety Disclosures	35
Item 5.	Other Information	35
Item 6.	Exhibits	36
Signatures		37

PART I—FINANCIAL INFORMATION

Item 1. Consolidated Financial Statements (Unaudited).

SAB Biotherapeutics, Inc. and Subsidiaries
Consolidated Balance Sheets

	June 30, 2023 (Unaudited)	December 31, 2022
Assets		
Current assets		
Cash and cash equivalents	$ 7,774,459	$ 15,046,894
Accounts receivable, net	364,117	5,556,577
Prepaid expenses	867,604	1,493,982
Total current assets	9,006,180	22,097,453
Long-term prepaid insurance	434,000	467,694
Operating lease right-of-use assets	730,583	1,192,054
Financing lease right-of-use assets	3,744,185	3,896,873
Property, plant and equipment, net	21,527,612	23,250,853
Total assets	$ **35,442,560**	$ **50,904,927**
Liabilities and Stockholders' Equity		
Current liabilities		
Accounts payable	$ 1,403,847	$ 3,679,116
Notes payable	111,894	772,665
Operating lease liabilities, current portion	545,964	490,794
Finance lease liabilities, current portion	127,022	132,788
Deferred grant income	2,894,781	—
Accrued expenses and other current liabilities	5,927,527	9,917,981
Total current liabilities	11,011,035	14,993,344
Operating lease liabilities, noncurrent	91,816	361,225
Finance lease liabilities, noncurrent	3,485,754	3,629,642
Warrant liabilities	595,860	320,930
Convertible Debt	541,644	541,644
Total liabilities	15,726,109	19,846,785
Commitments and contingencies (Note 16)		
Stockholders' equity		
Preferred stock; $0.0001 par value; 10,000,000 shares authorized, 0 shares issued and outstanding at June 30, 2023 and December 31, 2022	—	—
Common stock; $0.0001 par value; 490,000,000 shares authorized at June 30, 2023 and December 31, 2022; 52,861,314 and 50,940,920 shares issued, respectively, and 52,314,656 and 50,394,262 outstanding at June 30, 2023 and December 31, 2022, respectively	5,286	5,094
Treasury stock, at cost; 546,658 shares held at June 30, 2023 and December 31, 2022	(5,521,246)	(5,521,246)
Additional paid-in capital	87,336,872	84,444,049
Accumulated deficit	(62,104,461)	(47,869,755)
Total stockholders' equity	19,716,451	31,058,142
Total liabilities and stockholders' equity	$ **35,442,560**	$ **50,904,927**

See accompanying notes to the consolidated financial statements

SAB Biotherapeutics, Inc. and Subsidiaries
Consolidated Statements of Operations
(Unaudited)

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Revenue				
Grant revenue	$ 85,518	$ 6,350,525	$ 666,619	$ 18,153,601
Total revenue	85,518	6,350,525	666,619	18,153,601
Operating expenses				
Research and development	3,662,130	8,584,427	8,197,851	21,947,692
General and administrative	2,900,006	4,309,042	6,347,395	9,456,191
Total operating expenses	6,562,136	12,893,469	14,545,246	31,403,883
Loss from operations	(6,476,618)	(6,542,944)	(13,878,627)	(13,250,282)
Other income (expense)				
Changes in fair value of warrant liabilities	(357,516)	1,730,080	(274,930)	9,579,652
Interest expense	(75,320)	(71,237)	(167,705)	(143,259)
Interest income	28,568	15,824	86,556	23,757
Total other income (expense)	(404,268)	1,674,667	(356,079)	9,460,150
Loss before income taxes	(6,880,886)	(4,868,277)	(14,234,706)	(3,790,132)
Income tax expense (benefit)	—	(92,281)	—	—
Net loss	$ (6,880,886)	$ (4,775,996)	$ (14,234,706)	$ (3,790,132)
Loss per common share attributable to the Company's shareholders				
Basic and diluted earnings per common share	$ (0.14)	$ (0.11)	$ (0.28)	$ (0.09)
Weighted-average common shares outstanding – basic and diluted	50,421,262	42,999,413	50,407,412	43,048,254

See accompanying notes to the consolidated financial statements.

SAB Biotherapeutics, Inc. and Subsidiaries
Consolidated Statements of Changes In Stockholders' Equity
(Unaudited)

	Common stock			Treasury Stock			
	Shares	Amount	Additional Paid-In Capital	Shares	Amount	Accumulated Deficit	Total Stockholders' Equity
Balance at December 31, 2021	**43,487,279**	**$ 4,349**	**$ 67,674,515**	**—**	**$ —**	**$ (29,128,951)**	**$ 38,549,913**
Issuance of common stock for exercise of stock options	14,500	1	7,829	—	—	—	7,830
Forward Share Purchase Agreement, final settlement	—	—	817,060	—	—	—	817,060
Repurchase of common stock pursuant to the Forward Share Purchase Agreement	—	—	5,521,246	(546,658)	(5,521,246)	—	—
Stock-based compensation	—	—	897,600	—	—	—	897,600
Net income	—	—	—	—	—	985,863	985,863
Balance at March 31, 2022	**43,501,779**	**$ 4,350**	**$ 74,918,250**	**(546,658)**	**$ (5,521,246)**	**$ (28,143,088)**	**$ 41,258,266**
Issuance of common stock for exercise of stock options	75,764	8	69,133	—	—	—	69,141
Stock-based compensation	—	—	569,861	—	—	—	569,861
Net loss	—	—	—	—	—	(4,775,996)	(4,775,996)
Balance at June 30, 2022	**43,577,543**	**$ 4,358**	**$ 75,557,244**	**(546,658)**	**$ (5,521,246)**	**$ (32,919,084)**	**$ 37,121,272**
Balance at December 31, 2022	**50,940,920**	**$ 5,094**	**$ 84,444,049**	**(546,658)**	**$ (5,521,246)**	**$ (47,869,755)**	**$ 31,058,142**
Issuance of common stock for exercise of stock options	3,500	—	1,890	—	—	—	1,890
Professional fees paid with warrants	—	—	93,530	—	—	—	93,530
Stock-based compensation	—	—	602,780	—	—	—	602,780
Net loss	—	—	—	—	—	(7,353,820)	(7,353,820)
Balance at March 31, 2023	**50,944,420**	**$ 5,094**	**$ 85,142,249**	**(546,658)**	**$ (5,521,246)**	**$ (55,223,575)**	**$ 24,402,522**
Issuance of common stock for settlement of accrued liabilities	1,916,894	192	1,549,808	—	—	—	1,550,000
Stock-based compensation	—	—	644,815	—	—	—	644,815
Net loss	—	—	—	—	—	(6,880,886)	(6,880,886)
Balance at June 30, 2023	**52,861,314**	**$ 5,286**	**$ 87,336,872**	**(546,658)**	**$ (5,521,246)**	**$ (62,104,461)**	**$ 19,716,451**

See accompanying notes to the consolidated financial statements.

SAB Biotherapeutics, Inc. and Subsidiaries
Consolidated Statements of Cash Flows
(Unaudited)

	Six Months Ended June 30,	
	2023	**2022**
Cash flows from operating activities:		
Net loss	$ (14,234,706)	$ (3,790,132)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	1,767,226	1,385,427
Amortization of right-of-use assets	48,209	73,016
Stock-based compensation expense	1,247,595	1,467,461
Gain on sale of equipment	—	(14,278)
Changes in fair value of warrant liabilities	274,930	(9,579,652)
Professional fees paid with equity instruments	143,530	—
Changes in operating assets and liabilities:		
Accounts receivable	5,194,842	(1,601,964)
Prepaid expenses	657,689	324,889
Operating lease right-of-use assets	266,755	(36,056)
Accounts payable	(2,275,271)	485,058
Due to related party	—	(2,367)
Deferred grant income	2,894,781	(100,000)
Accrued expense and other current liabilities	(2,490,453)	(2,597,169)
Net cash used in operating activities	**(6,504,873)**	**(13,985,767)**
Cash flows from investing activities:		
Proceeds from the sale of equipment	—	76,390
Purchases of equipment	(43,984)	(1,970,156)
Net cash used in investing activities	**(43,984)**	**(1,893,766)**
Cash flows from financing activities:		
Payments of notes payable	(660,772)	(1,516,833)
Payments related to the Forward Share Purchase Agreement	—	(5,521,246)
Principal payments on finance leases	(64,696)	(87,884)
Proceeds from exercise of stock options	1,890	76,971
Net cash used in financing activities	**(723,578)**	**(7,048,992)**
Net decrease in cash and cash equivalents	(7,272,435)	(22,928,525)
Cash and cash equivalents		
Beginning of year	15,046,894	39,545,018
End of period	$ 7,774,459	$ 16,616,493
Supplemental disclosures:		
Cash paid for interest	$ 120,022	$ 143,259
Supplemental information on non-cash investing and finance activities:		
Settlement of accrued liabilities through the issuance of common stock	$ 1,500,000	$ —

See accompanying notes to the consolidated financial statements.

SAB BIOTHERAPEUTICS, INC. AND SUBSIDIARIES

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS (UNAUDITED)

(1) Nature of Business

On October 22, 2021 (the "Closing Date"), we consummated the business combination contemplated by the agreement and plan of merger, dated as of June 21, 2021, as amended on August 12, 2021, made by and among Big Cypress Acquisition Corp., a Delaware corporation ("BCYP"), Big Cypress Merger Sub Inc., a Delaware corporation ("Merger Sub"), SAB Biotherapeutics, Inc., a Delaware corporation ("SAB" or "SAB Biotherapeutics" or the "Company"), and Shareholder Representative Services LLC, a Colorado limited liability company, solely in its capacity as the representative, agent and attorney-in-fact of the SAB Stockholders (the "Business Combination"). Upon closing of the Business Combination, Merger Sub merged with SAB Biotherapeutics, with SAB Biotherapeutics as the surviving company of the merger. Upon closing of the Business Combination, BCYP changed its name to "SAB Biotherapeutics, Inc."

SAB is a clinical-stage biopharmaceutical company focused on the development and commercialization of a portfolio of products from its proprietary immunotherapy platform to produce fully targeted human polyclonal antibodies, without using human plasma or serum. SAB's novel DiversitAb platform enables the rapid production of large amounts of targeted human polyclonal antibodies, leveraging transchromosomic cattle (Tc Bovine™) that have been genetically designed to produce human antibodies (immunoglobulin G) rather than bovine in response to an antigen. Animal antibodies have been made in rabbits, sheep and horses. However, SAB's platform is the first to produce fully human antibodies in large animals.

Going Concern

As of June 30, 2023, the Company has experienced net losses, negative cash flows from operations and had an accumulated deficit of $62.1 million. The Company anticipates to continue to generate losses for the foreseeable future and expects the losses to increase as the Company continues the development of, and seek regulatory approvals for, product candidates, and begin commercialization of products. As a result, the Company will require additional capital to fund operations in order to support long-term plans, in particular, following the JPEO Rapid Response Contract Termination (see Note 4, *Revenue* for further information about the JPEO Rapid Response Contract Termination). These factors raise substantial doubt about the Company's ability to continue as a going concern for the one-year period following the date that these financial statements were issued.

To continue as a going concern, the Company will need, among other things, to raise additional capital resources. The Company plans to seek additional funding through a combination of equity or debt financings, or other third-party financing, collaborative or other funding arrangements. Should the Company seek additional financing from outside sources, the Company may not be able to raise such financing on terms acceptable to the Company or at all. If the Company is unable to raise additional capital when required or on acceptable terms, the Company may be required to scale back or discontinue the advancement of product candidates, reduce headcount, liquidate assets, file for bankruptcy, reorganize, merge with another entity, or cease operations.

The unaudited consolidated financial statements as of June 30, 2023, have been prepared on the basis that the Company will continue as a going concern, and do not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classification of liabilities that may result from the possible inability for the Company to continue as a going concern.

(2) Summary of Significant Accounting Policies

A summary of the significant accounting policies applied in preparation of the accompanying consolidated financial statements is set forth below.

Basis of presentation

The financial statements have been prepared in conformity with U.S. Generally Accepted Accounting Principles ("GAAP") and include all adjustments necessary for the fair presentation of the Company's financial position for the periods presented.

The Business Combination was accounted for as a reverse recapitalization in accordance with U.S. GAAP (the "Reverse Recapitalization"). Under this method of accounting, BCYP is treated as the "acquired" company and SAB Biotherapeutics is treated as the acquirer for financial reporting purposes. Accordingly, for accounting purposes, the Reverse Recapitalization was treated as the equivalent of SAB Biotherapeutics issuing stock for the net assets of BCYP, accompanied by a recapitalization. The net assets of BCYP are stated at historical cost, with no goodwill or other intangible assets recorded. SAB Biotherapeutics was determined to be the accounting acquirer based on the following predominant factors:

- SAB Biotherapeutics' shareholders have the largest portion of voting rights in the Company;
- the board of directors and management are primarily composed of individuals associated with SAB Biotherapeutics;
- the operations of SAB comprise the ongoing operations of the Company.

The consolidated assets, liabilities and results of operations prior to the Reverse Recapitalization are those of SAB Biotherapeutics. At the Closing Date, and subject to the terms and conditions of the Merger Agreement, each share of SAB Biotherapeutics common stock, par value $0.0001 per share, and each share of the SAB Biotherapeutics convertible preferred stock that was convertible into a share of SAB Biotherapeutics common stock at a one-to-one ratio, was converted into common stock of the Company equal to approximately 0.4653 (the "Exchange Ratio"). The shares and corresponding capital amounts and losses per share, prior to the Business Combination, have been retroactively restated based on shares reflecting the Exchange Ratio established in the Business Combination.

Emerging growth company status

The Company is an “emerging growth company,” as defined in Section 2(a) of the Securities Act of 1933, as amended (the "Securities Act"), as modified by the Jumpstart our Business Startups Act of 2012, (the “JOBS Act”), and it may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in its periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

Further, Section 102(b)(1) of the JOBS Act exempts emerging growth companies from being required to comply with new or revised financial accounting standards until private companies (that is, those that have not had a Securities Act registration statement declared effective or do not have a class of securities registered under the Securities Exchange Act of 1934, as amended (the “Exchange Act”) are required to comply with the new or revised financial accounting standards. The JOBS Act provides that a company can elect to opt out of the extended transition period and comply with the requirements that apply to non-emerging growth companies but any such election to opt out is irrevocable. The Company has elected not to opt out of such extended transition period which means that when a standard is issued or revised and it has different application dates for public or private companies, the Company, as an emerging growth company, can adopt the new or revised standard at the time private companies adopt the new or revised standard. This may make comparison of the Company’s financial statements with another public company which is neither an emerging growth company nor an emerging growth company which has opted out of using the extended transition period difficult or impossible because of the potential differences in accounting standards used.

Principles of consolidation

The accompanying consolidated financial statements include the results of the Company and its wholly owned subsidiaries, SAB Sciences, Inc., SAB Capra, LLC, Aurochs, LLC, and SAB BIO PTY LTD. Intercompany balances and transactions have been eliminated in consolidation.

Significant risks and uncertainties

The Company’s operations are subject to a number of factors that can affect its operating results and financial condition. Such factors include, but are not limited to, the results of research and development efforts, clinical trial activities of the Company’s product candidates, the Company’s ability to obtain regulatory approval to market its product candidates, competition from products manufactured and sold or being developed by other companies, and the Company’s ability to raise capital.

The Company currently has no commercially approved products and there can be no assurance that the Company’s research and development will be successfully commercialized. Developing and commercializing a product requires significant time and capital and is subject to regulatory review and approval as well as competition from other biotechnology and pharmaceutical companies. The Company operates in an environment of rapid change and is dependent upon the continued services of its employees and obtaining and protecting intellectual property. Additional funding may be needed to cover operational costs as the Company moves forward with the Company’s efforts to develop a commercially approved product.

Use of estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities, revenue and expenses and the disclosure of contingent assets and liabilities in the financial statements. The Company has used significant estimates in its determination of stock-based compensation assumptions, determination of the fair value of the Company’s common stock prior to becoming a public company, determination of the fair value of the Company’s warrants, determination of the incremental borrowing rate (“IBR”) used in the calculation of the Company’s right of use assets and lease liabilities, and the valuation allowance on deferred tax assets. Actual amounts realized may differ from these estimates.

Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The following fair value hierarchy classifies the inputs to valuation techniques that would be used to measure fair value into one of three levels:

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3: Unobservable inputs that reflect the reporting entity’s own assumptions.

Certain of the Company’s financial instruments are not measured at fair value on a recurring basis but are recorded at amounts that approximate their fair value due to the short-term nature of their maturities, such as cash and cash equivalents, accounts receivable, accounts payable and accrued expenses.

The Company accounts for warrants to purchase its common stock pursuant to ASC Topic 470, *Debt*, and ASC Topic 480, *Distinguishing Liabilities from Equity*, and classifies warrants for common stock as liabilities or equity. The warrants classified as liabilities are reported at their estimated fair value (see Note 12, *Fair Value Measurements*) and any changes in fair value are reflected in other income and expense. The warrants classified as equity are reported at their estimated relative fair value with no subsequent remeasurement. The Company's outstanding warrants are discussed in more detail in Note 12, *Fair Value Measurements*.

Cash and cash equivalents

Cash equivalents include short-term, highly liquid instruments, consisting of money market accounts and short-term investments with original maturities at the date of purchase of 90 days or less.

Accounts receivable

Accounts receivable are carried at original invoice amount, less an allowance for doubtful accounts. The Company estimates an allowance for doubtful accounts for potential credit losses that are expected to be incurred, based on management's assessment of the collectability of specific accounts, the aging of the accounts receivable, historical information and other currently available evidence. Receivables are written off when deemed uncollectible. To date, no receivables have been written off. The Company had no allowance for doubtful accounts as of June 30, 2023 and December 31, 2022.

Concentration of credit risk

The Company maintains its cash and cash equivalent balances in the form of business checking accounts and money market accounts, the balances of which, at times, may exceed federally insured limits. Although the Company currently believes that the financial institutions with whom it does business, will be able to fulfill their commitments to the Company, there is no assurance that those institutions will be able to continue to do so. The Company has not experienced any credit losses associated with its balances in such accounts for the six months ended June 30, 2023 and June 30, 2022.

The Company received 100% of its total revenue through grants from government organizations during the three and six months ended June 30, 2023 and 2022.

Lease liabilities and right-of-use assets

The Company is party to certain contractual arrangements for equipment, lab space, and an animal facility, which meet the definition of leases under Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") Topic 842, *Leases* ("ASC 842"). In accordance with ASC 842, the Company recorded right-of-use assets and related lease liabilities for the present value of the lease payments over the lease terms. The Company's IBR was used in the calculation of its right-of-use assets and lease liabilities.

The Company elected not to apply the recognition requirements of ASC 842 to short-term leases, which are deemed to be leases with a lease term of twelve months or less. Instead, the Company recognized lease payments in the Consolidated Statements of Operations on a straight-line basis over the lease term and variable payments in the period in which the obligation for these payments was incurred. The Company elected this policy for all classes of underlying assets.

Research and development expenses

Expenses incurred in connection with research and development activities are expensed as incurred. These include licensing fees to use certain technology in the Company's research and development projects, fees paid to consultants and various entities that perform certain research and testing on behalf of the Company, and expenses related to salaries, benefits, and stock-based compensation granted to employees in research and development functions.

During the three and six months ended June 30, 2023 and 2022, the Company had contracts with multiple contract research organizations ("CRO") to complete studies as part of research grant agreements. In the case of SAB-185, the CRO was contracted and paid by the US government—as of June 30, 2023 there is no active CRO engaged by the Company in work on SAB-185. For SAB-176, PPD Development, LP acting as the CRO oversaw the Phase 1 safety study. The terms of that agreement are subject to confidentiality, and the status of the agreement is that it is current, in good standing and 100% of the contract has been paid as of June 30, 2023. SAB has also contracted with hVIVO Services Limited to conduct the Phase 2a influenza study on SAB-176. The terms of that agreement are subject to confidentiality, and the status of the agreement is that it is current, in good standing and 100% of the contract has been paid as of June 30, 2023.

Equipment

The Company records equipment at cost less depreciation. Depreciation is calculated using straight-line methods over the following estimated useful lives (in years):

(in years)	
Animal facility equipment	7
Laboratory equipment	7
Leasehold improvements	Shorter of asset life or lease term
Office furniture & equipment	5
Vehicles	5

Repairs and maintenance expenses are expensed as incurred.

Impairment of long-lived assets

The Company reviews the recoverability of long-lived assets, including the related useful lives, whenever events or changes in circumstances indicate that the carrying amount of a long-lived asset may not be recoverable. If necessary, the Company compares the estimated undiscounted future net cash flows to the related asset's carrying value to determine whether there has been an impairment. If an asset is considered impaired, the asset is written down to fair value, which is based either on discounted cash flows or appraised values in the period the impairment becomes known. The Company believes that long-lived assets are recoverable, and no impairment was deemed necessary, during the three and six months ended June 30, 2023 and 2022.

Stock-based compensation

FASB ASC Topic 718, *Compensation – Stock Compensation*, prescribes accounting and reporting standards for all share-based payment transactions in which employee and non-employee services are acquired. The Company recognizes compensation cost relating to stock-based payment transactions using a fair-value measurement method, which requires all stock-based payments to employees, directors, and non-employee consultants, including grants of stock options, to be recognized in operating results as compensation expense based on fair value over the requisite service period of the awards. Prior to the Business Combination, the grant date fair value of the Company's common stock was typically determined by the Company's board of directors with the assistance of management and a third-party valuation specialist.

Subsequent to the Business Combination, the board of directors elected to determine the fair value of post-merger common stock based on the closing market price at closing on the date of grant. In determining the fair value of stock-based awards, the Company utilizes the Black-Scholes option-pricing model, which uses both historical and current market data to estimate fair value. The Black-Scholes option-pricing model incorporates various assumptions, such as the value of the underlying common stock, the risk-free interest rate, expected volatility, expected dividend yield, and expected life of the options. For awards with performance-based vesting criteria, the Company estimates the probability of achievement of the performance criteria and recognizes compensation expense related to those awards expected to vest. No awards may have a term in excess of ten years. Forfeitures are recorded when they occur. Stock-based compensation expense is classified in the consolidated statements of operations based on the function to which the related services are provided. The company recognizes stock-based compensation expense over the expected term.

Income taxes

Deferred income taxes reflect future tax effects of temporary differences between the tax and financial reporting basis of the Company's assets and liabilities measured using enacted tax laws and statutory tax rates applicable to the periods when the temporary differences will affect taxable income. When necessary, deferred tax assets are reduced by a valuation allowance, to reflect realizable value, and all deferred tax balances are reported as long-term on the consolidated balance sheet. Accruals are maintained for uncertain tax positions, as necessary.

Income tax expense includes the current tax liability from operations and the change in deferred income taxes during the year. Current tax liabilities or receivables are recognized for estimated income tax payable and/or refundable for the current year.

The Company uses a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken, or expected to be taken, in a tax return. The Company has elected to treat interest and penalties related to income taxes, to the extent they arise, as a component of income taxes.

Revenue recognition

The Company's revenue is primarily generated through grants from government and other (non-government) organizations.

Grant revenue is recognized during the period that the research and development services occur, as qualifying expenses are incurred, or conditions of the grants are met. The Company concluded that payments received under these grants represent conditional, nonreciprocal contributions, as described in ASC 958, *Not-for-Profit Entities*, and that the grants are not within the scope of ASC 606, *Revenue from Contracts with Customers*, as the organizations providing the grants do not meet the definition of a customer. Expenses for grants are tracked by using a project code specific to the grant, and the employees also track hours worked by using the project code.

Deferred grant income represents grant proceeds received by the Company prior to the period in which the research and development services occur, as qualifying expenses are incurred, or conditions of the grants are met.

Comprehensive income (loss)

The Company had no items of comprehensive income (loss) during the three and six months ended June 30, 2023 and 2022 other than its net loss.

Litigation

From time to time, the Company is involved in legal proceedings, investigations and claims generally incidental to its normal business activities. In accordance with U.S. GAAP, the Company accrues for loss contingencies when it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Legal costs in connection with loss contingencies are expensed as incurred.

Earnings per share

In accordance with ASC 260, *Earnings per Share* ("ASC 260"), basic net income (loss) per share attributable to common stockholders is computed by dividing net income (loss) attributable to common stockholders by the weighted-average number of common stock outstanding during the period. Diluted net income (loss) per share attributable to common stockholders is computed by dividing the diluted net income (loss) attributable to common stockholders by the weighted-average number of common stock outstanding for the period including potential dilutive common shares such as stock options.

Segment reporting

In accordance with ASC 280, *Segment Reporting*, the Company's business activities are organized into one reportable segment, as only the Company's operating results in their entirety are regularly reviewed by the Company's chief operating decision maker to make decisions about resources to be allocated

and to assess performance.

Common stock valuations

Prior to the Business Combination, the Company was required to periodically estimate the fair value of its common stock with the assistance of an independent third-party valuation firm, as discussed above, when issuing stock options and computing estimated stock-based compensation expense. The assumptions underlying these valuations represented the Company's best estimates, which involved inherent uncertainties and the application of significant levels of judgment. In order to determine the fair value of its common stock, the Company considered, among other items, previous transactions involving the sale of Company securities, the business, financial condition and results of operations, economic and industry trends, the market performance of comparable publicly traded companies, and the lack of marketability of the Company's common stock.

Subsequent to the Business Combination, the Company now determines the fair value of common stock based on the closing market price at closing on the date of grant.

Compensation expense related to stock-based transactions is measured and recognized in the financial statements at fair value of the post-merger common stock based on the closing market price at closing on the date of grant. Stock-based compensation expense is measured at the grant date based on the fair value of the equity award and is recognized as expense over the requisite service period, which is generally the vesting period, on the straight-line method. The Company estimates the fair value of each stock option award on the date of grant using the Black-Scholes option-pricing model. Determining the fair value of stock option awards at the grant date requires judgment, including estimating the expected volatility, expected term, risk-free interest rate, and expected dividends.

(3) New accounting standards

Recently adopted standards

In May 2021, FASB issued Accounting Standards Update ("ASU") 2021-04, *Earnings Per Share (Topic 260), Debt—Modifications and Extinguishments (Subtopic 470-50), Compensation—Stock Compensation (Topic 718), and Derivatives and Hedging—Contracts in Entity's Own Equity (Subtopic 815-40): Issuer's Accounting for Certain Modifications or Exchanges of Freestanding Equity-Classified Written Call Options*. The amendments in ASU 2021-04 provide guidance to clarify and reduce diversity in an issuer's accounting for modifications or exchanges of freestanding equity-classified written call options (for example, warrants) that remain equity classified after modification or exchange. The amendments in this ASU 2021-04 are effective for all entities for fiscal years beginning after December 15, 2021, and interim periods within those fiscal years, with early adoption permitted, including interim periods within those fiscal years. The Company adopted ASU 2021-04 at January 1, 2022, and the adoption did not have a material impact on its consolidated financial statements.

In July 2021, the FASB issued ASU 2021-05, *Leases (Topic 842) Lessors - Certain Leases with Variable Lease Payments*, to increase transparency and comparability among organizations by recognizing lease assets and lease liabilities as well as disclosing key information about leasing transactions. This guidance is effective for all entities for fiscal years beginning after December 15, 2021, and interim periods within those fiscal years for public business entities. The Company adopted ASU 2021-05 at January 1, 2022, and the adoption did not have a material impact on its consolidated financial statements.

In November 2021, the FASB issued ASU 2021-10, *Government Assistance (Topic 832): Disclosures by Business Entities about Government Assistance*. This ASU increases the transparency of government assistance to include the disclosure of (1) the types of assistance, (2) an entity's accounting for the assistance, and (3) the effect of the assistance on an entity's financial statements. The guidance in ASU 2021-10 is effective for financial statements of all entities, including private companies, for annual periods beginning after December 15, 2021, with early application permitted. Entities are required to provide the new disclosures prospectively for all transactions with a government entity that are accounted for under either a grant or a contribution accounting model and are reflected in the financial statements at the date of initially applying the new amendments, and to new transactions entered into after that date. The Company adopted ASU 2021-10 at January 1, 2022, and the adoption did not have a material impact on its consolidated financial statements.

In July 2016, the FASB issued ASU No. 2016-13, *Financial Instruments - Credit Losses (Topic 326): Measurement of Credit Losses on Financial Instruments* ("ASU 2016-13"), which requires the measurement of all expected credit losses of financial assets held at the reporting date based on historical experience, current conditions, and reasonable and supportable forecasts. Financial institutions and other organizations will now use forward-looking information to better inform their credit loss estimates. In addition, the ASU amends the accounting for credit losses on available-for-sale debt securities and purchased financial assets with credit deterioration. ASU 2016-13 is effective for periods beginning after December 15, 2022, and interim periods within those fiscal years. The Company adopted ASU 2016-13 at January 1, 2023, and the adoption did not have a material impact on its consolidated financial statements.

(4) Revenue

During the three and six months ended June 30, 2023 and 2022, the Company worked on the following grants:

Government grants

The total revenue for government grants was approximately $86 thousand and $667 thousand for the three and six months ended June 30, 2023, respectively, and approximately $6.4 million and $18.2 million, for the three and six months ended June 30, 2022, respectively.

National Institute of Health – National Institute of Allergy and Infectious Disease ("NIH-NIAID") (Federal Award #1R44AI117976-01A1) – this grant was for $1.4 million and started in September 2019 through August 2021. This grant was subsequently amended to extend the date through August 2022. No grant income was recognized for this grant for the three and six months ended June 30, 2023, and approximately $3 thousand and $30 thousand of grant income was recognized for the three and six months ended June 30, 2022, respectively. This grant was completed in 2022.

NIH-NIAID (Federal Award #1R41AI131823-02) – this grant was for approximately $1.5 million and started in April 2019 through March 2021. The grant was subsequently amended to extend the date through March 2023. No grant income was recognized for this grant for the three months ended June 30, 2023 and approximately $192 thousand of grant income was recognized for the six months ended June 30, 2023, and approximately $118 thousand and $131 thousand of grant income was recognized for the three and six months ended June 30, 2022, respectively. This grant was completed as of June 30, 2023.

NIH-NIAID through Geneva Foundation (Federal Award #1R01AI132313-01, Subaward #S-10511-01) – this grant was for approximately $2.7 million and started in August 2017 through July 2021. The grant was subsequently amended to extend the date through July 2023. Grant income recognized was approximately $37 thousand and $273 thousand for the three and six months ended June 30, 2023, respectively, and approximately $26 thousand and $49 thousand for the three and six months ended June 30, 2022, respectively. This grant was completed as of June 30, 2023.

US Department of Defense ("DoD"), Joint Program Executive Office for Chemical, Biological, Radiological and Nuclear Defense Enabling Biotechnologies ("JPEO") through Advanced Technology International – this grant was for a potential of $25 million, awarded in stages starting in August 2019 and with potential stages running through February 2023. Additional contract modifications were added to this contract in 2020 and 2021 for work on a COVID therapeutic, bringing the contract total to $203.6 million. Grant income recognized was approximately $44 thousand and $197 thousand for the three and six months ended June 30, 2023, respectively, and $6.2 million and $17.9 million for the three and six months ended June 30, 2022, respectively. This grant was terminated in 2022.

The grants for the JPEO Rapid Response contract are cost reimbursement agreements, with reimbursement of qualified direct research and development expense (labor and consumables) with an overhead charge (based on actual, reviewed quarterly) and a fixed fee (9%).

On August 3, 2022, the Company received notice from the DoD to terminate the JPEO Rapid Response contract, dated as of August 7, 2019 with the DoD most recently amended as of September 14, 2021, relating to a prototype research and development of Rapid Response Antibody Program and advanced clinical development through licensure and commercial manufacturing for SAB-185 (the "JPEO Rapid Response Contract Termination"). The Company engaged in negotiations with the DoD to compensate the Company for services provided prior to the JPEO Rapid Response Contract Termination and costs the Company would be expected to bear in future periods. A termination and settlement proposal was submitted to the DoD on September 9, 2022; the Company submitted a final invoice on December 15, 2022; and received payment from the DoD on or about January 12, 2023. The terms of the arrangement provide for a cost-reimbursable structure, and state that the parties will work in good faith equitable reimbursement for work performed toward accomplishment of the tasks provided in the agreement. At this time, other than certain deferred obligations (presented within deferred grant income within the Company's consolidated unaudited balance sheet) potentially payable to the DoD solely due to subsequent negotiations with third-party vendors, the Company believes and has been advised there is a reasonable, good faith basis for the position that no present or future obligations exist. Revenue recognized subsequent to the JPEO Rapid Response Contract Termination relates to satisfaction of residual obligations under the termination and settlement agreement—see Note 2, *Summary of Significant Accounting Policies* for further information about the Company's established revenue recognition process.

(5) Earnings per share

The following is a reconciliation of the numerator and denominator used to calculate basic earnings per share and diluted earnings per share for the three and six months ended June 30, 2023 and 2022:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Calculation of basic and diluted loss per share attributable to the Company's shareholders				
Net loss attributable to the Company's shareholders	$ (6,880,886)	$ (4,775,996)	$ (14,234,706)	$ (3,790,132)
Weighted-average common shares outstanding – basic and diluted	50,421,262	42,999,413	50,407,412	43,048,254
Net loss per share, basic and diluted	$ (0.14)	$ (0.11)	$ (0.28)	$ (0.09)

The Company's potentially dilutive securities, which include stock options, common stock warrants, convertible debt, earnout shares, and contingently issuable earnout shares have been excluded from the computation of diluted net loss per share as the effect would be to reduce the net loss per share. Therefore, the weighted average number of common shares outstanding used to calculate both basic and diluted net loss per share attributable to common stockholders is the same. The Company excluded the following potential common shares, presented based on amounts outstanding at each period end, from the computation of diluted net loss per share attributable to common stockholders for the periods indicated because including them would have had an anti-dilutive effect:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Stock options and awards	884,123	1,846,889	610,646	2,398,870
Convertible Debt	382,623	—	382,623	—
Common Stock Warrants (1)	13,832,890	5,958,600	13,832,890	5,958,600
Earnout Shares (2)	10,491,937	10,491,937	10,491,937	10,491,937
Contingently issuable Earnout Shares from unexercised Rollover Options	1,508,063	1,508,063	1,508,063	1,508,063
Total	27,099,636	19,805,489	26,826,159	20,357,470

(1) Included in Common Stock Warrants are the 5,750,000 publicly-traded warrants (the "Public Warrants"), 208,600 warrants held by assignees of Big Cypress Holdings, LLC (the "Private Placement Warrants"), 300,000 warrants held by Ladenburg Thalmann & Co. Inc. (the "Ladenburg Warrants"), 7,363,377 warrants issued to the investors in the December Private Placement (the "the PIPE Warrants"), and 210,913 warrants issued to the placement agent in the December Private Placement (the "PIPE Placement Agent Warrants"). See Note 12, *Fair Value Measurements* for further details on the Company's outstanding warrants.

(2) As the Earnout Shares are subject to certain vesting requirements not satisfied as of the three and six months ended June 30, 2023 and 2022, the Earnout Shares held in escrow are excluded from calculating both basic and diluted earnings per share.

(6) Property, plant and equipment, net

As of June 30, 2023 and December 31, 2022, the Company's equipment was as follows:

	June 30, 2023	December 31, 2022
Laboratory equipment	$ 9,979,079	$ 9,000,114
Animal facility	8,357,667	8,357,667
Animal facility equipment	1,141,213	1,141,213
Construction-in-progress	—	308,317
Leasehold improvements	9,296,343	9,296,343
Vehicles	208,453	192,683
Office furniture and equipment	631,910	1,233,038
Total Property, plant and equipment, gross	29,614,665	29,529,375
Less: accumulated depreciation and amortization	(8,087,053)	(6,278,522)
Property, plant and equipment, net	$ 21,527,612	$ 23,250,853

Depreciation and amortization expense was $0.87 million and $1.77 million for the three and six months ended June 30, 2023, respectively, and $0.75 million and $1.39 million for the three and six months ended June 30, 2022, respectively.

All tangible personal property with a useful life of at least three years and a unit acquisition cost of $5,000 or more will be capitalized and depreciated over its useful life using the straight-line method of depreciation. The Company will expense the full acquisition cost of tangible personal property below these thresholds in the year of purchase. The basis of accounting for depreciable fixed assets is acquisition cost and any additional expenditures required to make the asset ready for use. The carrying amount at the balance sheet date of long-lived assets under construction-in-progress includes assets purchased, constructed, or being developed internally that are not yet in service. Depreciation commences when the assets are placed in service.

As of June 30, 2023 and December 31, 2022, the Company's construction-in-progress was as follows:

	June 30, 2023	December 31, 2022
New office space at Headquarters	$ —	$ 85,767
IT equipment at Headquarters	—	84,739
Software	—	137,811
Total construction-in-progress	$ —	$ 308,317

(7) Leases

The Company has an operating lease for lab space from Sanford Health, under a lease that started in June 2014 and ran through June 2019, at which time the lease was amended to run through August 2024. This lease can be terminated with one-year advance written notice. This lease was amended again in October 2022 to reduce the Company's leased area to 21,014 square feet. Additionally, pursuant to the amendment in October 2022, the Company and Sanford Health agreed for the period of October 2022 to September 2023, the Company's obligation to pay the Annual Rent shall be abated and not required to be paid when normally due (the "Abated Rent"). In exchange for the Abated Rent, effective October 1, 2022, the Company issued Sanford Health an 8% unsecured, convertible promissory note (see Note 9, *Notes Payable* for further discussion). The October 2022 amendment was accounted for as a lease modification under ASC 842 - *Leases* and the right-of-use asset and lease liability were remeasured at the modification date of October 1, 2022. The October 2022 lease amendment reduced the lease payment to approximately $44 thousand per month. The lease does not provide an implicit rate, and, therefore, the Company used an IBR of 6.92% as the discount rate when measuring the operating lease liability. The operating lease does not include an option to extend beyond the life of the current term. The Company estimated the IBR based upon comparing interest rates available in the market for similar borrowings and the credit quality of the Company.

The Company entered into a lease for office, laboratory, and warehouse space in November 2020, the lease was amended in July 2022 to add additional administrative and lab space. This amended lease has a 3-year term, with options to extend for 3 additional periods of 3 years each. The options were not included in the right of use calculation as it is unclear as to whether or not the location will meet the Company's requirements beyond the next three years. The July 2022 amendment was accounted for as a separate contract under ASC 842 – *Leases*. The lease costs are $36 thousand and $2 thousand per month for the original leased space on November 2020 and the amendment on July 2022, respectively. The Company used an IBR of 4.69% and 6.60% as the discount rate when measuring the operating lease liability for the original leased space on November 2022 and the amended on July 2022, respectively. The Company estimated the IBR based upon comparing interest rates available in the market for similar borrowings and the credit quality of the Company.

The Company has the following finance leases:

- In December 2018, the Company entered into a finance lease with Dakota Ag Properties for a new animal facility which includes the surrounding land. The facility and the land have been accounted for as separate lease components. The lease is based upon payback of $4 million in construction costs, with a 20-year term at an interest rate of 8%. The monthly payment for this lease is approximately $33 thousand. The Company has the option to purchase the asset at any time during the term of the lease for the balance of the unamortized lease payments.
- In December 2018, the Company entered into an equipment lease for a 12,000-gallon propane tank that is located on the Company's animal facility. The lease is for five years, with an annual payment of approximately $8 thousand. The Company purchased the asset in November 2022.
- In July 2018, the Company entered into a lease agreement with a bank, for a Ruby Cell Analyzer. The lease agreement is for a five-year term. The monthly payment for this lease is $807. The Company has the option to purchase the asset at the end of the lease for $1. The Company purchased the asset in June 2023.

The lease agreements do not require material variable lease payments, residual value guarantees or restrictive covenants.

The amortizable lives of the operating lease assets are limited by their expected lease terms. The amortizable lives of the finance lease assets are limited by their expected lives, as the Company intends to exercise the purchase options at the end of the leases. The following is the estimated useful lives of the finance lease assets:

(in years)	
Animal Facility	40
Equipment	3–7
Land	Indefinite

The Company's weighted-average remaining lease term and weighted-average discount rate for operating and finance leases as of June 30, 2023 are:

	Operating	Finance
Weighted-average remaining lease term (in years)	0.96	15.42
Weighted-average discount rate	6.42%	7.72%

The table below reconciles the undiscounted future minimum lease payments under non-cancelable leases with terms of more than one year to the total lease liabilities recognized on the consolidated balance sheet as of June 30, 2023:

	Operating	Finance
2023 - remaining	$ 292,655	$ 200,748
2024	368,320	401,496
2025	—	401,496
2026	—	401,496
2027	—	401,496
Thereafter	—	4,382,998
Undiscounted future minimum lease payments	660,975	6,189,730
Less: Amount representing interest payments	(23,195)	(2,576,954)
Total lease liabilities	637,780	3,612,776
Less current portion	(545,964)	(127,022)
Noncurrent lease liabilities	$ 91,816	$ 3,485,754

Operating lease expense was approximately $249 thousand and $291 thousand, respectively, for the three months ended June 30, 2023 and 2022, and $492 thousand and $585 thousand, respectively, for the six months ended June 30, 2023 and 2022. Operating lease costs are included within research and development expenses on the consolidated statements of operations.

Finance lease costs for the three months ended June 30, 2023 and 2022 included approximately $23 thousand and $32 thousand, respectively, in right-of-use asset amortization, and approximately $71 thousand and $71 thousand, respectively, of interest expense. Finance lease cost for the six months ended June 30, 2023 and 2022 included approximately $48 thousand and $73 thousand, respectively, and in right-of-use asset amortization included approximately $140 thousand and $143 thousand, respectively, of interest expense. Finance lease costs are included within research and development expenses on the consolidated statements of operations.

Cash payments under operating and finance leases were approximately $118 thousand and $103 thousand, respectively, for the three months ended June 30, 2023. Cash payments under operating and finance leases were approximately $309 thousand and $110 thousand, respectively, for the three months ended June 30, 2022. Cash payments under operating and finance leases were approximately $236 thousand and $206 thousand, respectively, for the six months ended June 30, 2023. Cash payments under operating and finance leases were approximately $621 thousand and $231 thousand, respectively, for the six months ended June 30, 2022.

(8) Accrued Expenses and Other Current Liabilities

As of June 30, 2023 and December 31, 2022, accrued expenses and other current liabilities consisted of the following:

	June 30, 2023	December 31, 2022
Accrued vacation	$ 648,909	$ 511,849
Accrued payroll	347,676	357,390
Accrued construction-in-progress	—	85,767
Accrued consulting	290,329	186,833
Accrued clinical trial expense	74,658	355,479
Accrued outside laboratory services	467,612	1,106,903
Accrued bonus & severance	35,192	950,324
Accrued contract manufacturing	—	25,129
Accrued legal	803,255	856,505
Accrued financing fees payable	2,910,500	4,910,500
Accrued franchise tax payable	20,000	50,000
Accrued interest	55,875	8,192
Other accrued expenses	273,521	513,110
	$ 5,927,527	$ 9,917,981

(9) Notes Payable

8% Unsecured Convertible Note

Pursuant to the Fourth Amendment to the Company's lease with Sanford Health, the Company and Sanford Health agreed to a period of Abated Rent from October 1, 2022 to September 30, 2023. In exchange for the Abated Rent, effective as of October 1, 2022, the Company issued to Sanford Health an 8% unsecured, convertible promissory note (the "8% Unsecured Convertible Note").

Pursuant to the October Note, the Company shall pay the sum of approximately $542 thousand (the "Principal") plus accrued and unpaid interest thereon on September 31, 2024 (the "Maturity Date"). Simple interest shall accrue on the outstanding Principal from and after the date of the October Note and shall be payable on the Maturity Date. Sanford Health shall have the right, but not the obligation, to convert all or any part of the outstanding Principal of the October Note, together with any accrued and unpaid interest thereon to the date of such conversion, into such number of fully paid and non-assessable shares of the Company's common stock, at any time and from time to time, prior to the later of the Maturity Date and the date on which the October Note is paid in full, subject to certain restrictions, at a conversion price per share of common stock equal to greater of (x) $1.50 and (y) the price at which the Company sells shares of common stock in any bona fide private or public equity financing prior to the Maturity Date.

The Company evaluated the treatment of the 8% Unsecured Convertible Note under ASC 470 and ASU 2020-06 (early adopted by the Company as of January 1, 2021) and determined the Note in its entirety would be allocated to debt without separating the nonconvertible debt. The Company's consolidated balance sheet as of June 30, 2023 includes accrued interest relating to the 8% Unsecured Convertible Note of approximately $32 thousand.

Insurance Financing

The Company obtained financing for certain Director & Officer liability insurance policy premiums. The agreement assigns First Insurance Funding (Lender) a first priority lien on and security interest in the financed policies and any additional premium required in the financed policies including (a) all returned or unearned premiums, (b) all additional cash contributions or collateral amounts assessed by the insurance companies in relation to the financed policies and financed by Lender, (c) any credits generated by the financed policies, (d) dividend payments, and (e) loss payments which reduce unearned premiums. If any circumstances exist in which premiums related to any Financed Policy could become fully earned in the event of loss, Lender shall be named a loss-payee with respect to such policy.

The total premiums, taxes and fees financed is approximately $1.2 million with an annual interest rate of 5.47%. In consideration of the premium payment by Lender to the insurance companies or the Agent or Broker, the Company unconditionally promises to pay Lender the amount Financed plus interest and other charges permitted under the Agreement. At June 30, 2023 and December 31, 2022, the Company recognized approximately $112 thousand and $773 thousand, respectively, as an insurance financing note payable in its consolidated balance sheets. The Company will pay the insurance financing through installment payments with the last payment for the current note being on September 22, 2023.

(10) Stockholders' Equity

Authorized and Outstanding Capital Stock

The total number of shares of the Company's authorized capital stock is 500,000,000. The total amount of authorized capital stock consists of 490,000,000 shares of common stock and 10,000,000 shares of preferred stock. As of June 30, 2023, no shares of preferred stock are issued or outstanding.

Common Stock

Holders of SAB Biotherapeutics common stock are entitled to one vote for each share held on all matters submitted to a vote of stockholders, including the election of directors, and do not have cumulative voting rights. Subject to preferences that may be applicable to any then outstanding preferred stock, holders of SAB Biotherapeutics common stock are entitled to receive ratably those dividends, if any, as may be declared by the Company's board of directors out of legally available funds. In the event of liquidation, dissolution or winding up, the holders of SAB Biotherapeutics common stock will be entitled to share ratably in the assets legally available for distribution to stockholders after the payment of or provision for all of the Company's debts and other liabilities, subject to the prior rights of any preferred stock then outstanding. Holders of SAB Biotherapeutics common stock have no preemptive or conversion rights or other subscription rights and there are no redemption or sinking fund provisions applicable to the SAB Biotherapeutics common stock. All outstanding shares of common stock are duly authorized, validly issued, fully paid and nonassessable. The rights, preferences and privileges of holders of SAB Biotherapeutics common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that the Company may designate and issue in the future.

Preferred Stock

Under the terms of the Company's certificate of incorporation, its board of directors has the authority, without further action by the Company's stockholders, to issue up to 10,000,000 shares of preferred stock in one or more series, to establish from time to time the number of shares to be included in each such series, to fix the dividend, voting and other rights, preferences and privileges of the shares of each wholly unissued series and any qualifications, limitations or restrictions thereon, and to increase or decrease the number of shares of any such series, but not below the number of shares of such series then outstanding.

The Company's board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of SAB Biotherapeutics common stock. The issuance of preferred stock, while providing flexibility in connection with possible acquisitions and other corporate purposes, could, among other things, have the effect of delaying, deterring or preventing a change in the Company's control and may adversely affect the market price of SAB Biotherapeutics common stock and the voting and other rights of the holders of SAB Biotherapeutics common stock. The Company has no current plans to issue any shares of preferred stock.

Earnout Shares

Additionally, the Business Combination agreement included an earnout provision whereby the shareholders of SAB Biotherapeutics shall be entitled to receive additional consideration ("Earnout Shares") if the Company meets certain Volume Weighted Average Price ("VWAP") thresholds, or a change in control with a per share price exceeding the VWAP thresholds within a five-year period immediately following the Closing.

The Earnout Shares shall be released in four equal increments as follows:

(i) 25% of the Earnout Shares shall be released if, at any time during the five (5)-year period immediately following the Closing Date, the VWAP of the Company's publicly traded common stock is greater than or equal to $15.00 for any twenty (20) trading days within a period of thirty (30) consecutive trading days (the "First Earnout").

(ii) 25% of the Earnout Shares shall be released if, at any time during the five (5)-year period immediately following the Closing Date, the VWAP of the Company's publicly traded common stock is greater than or equal to $20.00 for any twenty (20) trading days within a period of thirty (30) consecutive trading days (the "Second Earnout").

(iii) 25% of the Earnout Shares shall be released if, at any time during the five (5)-year period immediately following the Closing Date, the VWAP of the Company's publicly traded common stock is greater than or equal to $25.00 for any twenty (20) trading days within a period of thirty (30) consecutive trading days (the "Third Earnout").

(iv) 25% of the Earnout Shares shall be released if, at any time during the five (5)-year period immediately following the Closing Date, the VWAP of the Company's publicly traded common stock is greater than or equal to $30.00 for any twenty (20) trading days within a period of thirty (30) consecutive trading days (the "Fourth Earnout" and together with the First Earnout, the Second Earnout and the Third Earnout, the "Earnouts").

At the Effective Time, each outstanding share of SAB Biotherapeutics common stock, including shares of SAB Biotherapeutics common stock resulting from the conversion of outstanding shares of SAB Biotherapeutics preferred stock (as calculated pursuant to the SAB Biotherapeutics certificate of incorporation), immediately prior to the Effective Time, was converted into the right to receive a pro rata portion of the total consideration and the contingent right to receive a pro rata portion of the Earnout Shares.

Pursuant to the terms of the Business Combination Agreement, SAB Biotherapeutics' securityholders (including vested option holders) who own SAB Biotherapeutics securities immediately prior to the Closing Date will have the contingent right to receive their pro rata portion of (i) an aggregate of 12,000,000 shares of Common Stock, of which 1,508,063 are contingently issuable based upon future satisfaction of the aforementioned VWAP thresholds. The remaining 10,491,937 are legally issued and outstanding, if the Company does not meet the above VWAP thresholds, or a change in control with a per share price below the VWAP thresholds occurs within a five-year period immediately following the Closing Date, the shares will be returned to the Company.

Warrants

For information pertaining to the Company's outstanding warrants to purchase shares of the Company's common stock, see Note 12, *Fair Value Measurements*.

(11) Stock Option Plans

On August 5, 2014, the Company approved a stock option grant plan (the "2014 Equity Incentive Plan") for employees, directors, and non-employee consultants, which provides for the issuance of options to purchase common stock. The total shares authorized under the plan was originally 8 million; however, during 2019, the Plan was amended to increase the total shares authorized under the plan to 16 million. As a result of the Business Combination, the 2014 Equity Incentive Plan was amended to reduce the shares authorized to 7,444,800 based upon the impact of the Exchange Ratio.

As a result of the Business Combination, the Company adopted the 2021 Omnibus Equity Incentive Plan (hereinafter collectively with the 2014 Equity Incentive Plan referred to as the "Equity Compensation Plans"), representing 11,000,000 shares of common stock reserved for issuance under the 2021 Omnibus Equity Incentive Plan. At of the beginning of the each calendar year, the shares reserved for future issuance shall increase by two percent (2%) of the total number of shares of Common Stock issued and outstanding as of the end of the most recently completed fiscal year. As of June 30, 2023, 12,877,631 shares of common stock were reserved for future issuance under the 2021 Omnibus Equity Incentive Plan.

The expected term of the stock options was estimated using the "simplified" method, as defined by the SEC's Staff Accounting Bulletin No. 107, *Share-Based Payment*. The volatility assumption was determined by examining the historical volatilities for industry peer companies, as the Company does not have sufficient trading history for its common stock. The risk-free interest rate assumption is based on the U.S. Treasury instruments whose term was consistent with the expected term of the options. The dividend assumption is based on the Company's history and expectation of dividend payouts. The Company has never paid dividends on its common stock and does not anticipate paying dividends on its common stock in the foreseeable future. Therefore, the Company has assumed no dividend yield for purposes of estimating the fair value of the options.

Stock Options

Stock option activity for employees and non-employees under the Equity Compensation Plans for the six months ended June 30, 2023 was as follows:

	Options	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (years)	Aggregate Intrinsic Value
Outstanding options, December 31, 2022	7,095,462	$ 1.99	5.79	$ 109,891
Granted	2,911,750	$ 0.57		
Forfeited	(33,847)	$ 2.26		
Exercised	(3,500)	$ 0.54		
Expired	(32,076)	$ 4.90		
Outstanding options, June 30, 2023	9,937,789	$ 1.56	6.59	$ 1,660,330
Options vested and exercisable, June 30, 2023	4,539,909	$ 2.01	3.23	$ 637,770

Total unrecognized compensation cost related to non-vested stock options as of June 30, 2023 was approximately $4.2 million and is expected to be recognized within future operating results over a weighted-average period of 3.34 years.

The weighted average grant date fair value of options granted during the three months ended June 30, 2023 and 2022, was $0.57 per share and $1.79 per share; respectively. During the three months ended June 30, 2023 and 2022, approximately 167 thousand shares with a fair value totaling $595 thousand, and 135 thousand shares with a fair value totaling $595 thousand, respectively, vested.

The weighted average grant date fair value of options granted during the six months ended June 30, 2023 and 2022, was $0.41 per share and $1.76 per share, respectively. During the six months ended June 30, 2023 and 2022, approximately 381 thousand shares with a fair value totaling $1.2 million, and 315 thousand shares with a fair value totaling $1.3 million, respectively, vested.

The estimated fair value of stock options granted to employees and consultants during the three and six months ended June 30, 2023 and 2022, were calculated using the Black-Scholes option-pricing model using the following assumptions:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Expected volatility	80.2 - 81.5%	85.4%	80.2 - 81.9%	78.0 - 85.4%
Weighted-average volatility	80.9%	85.4%	81.7%	79.0%
Expected dividends	—%	—%	—%	—%
Expected term (in years)	5.77 - 6.08	5.89	5.77 - 6.08	5.50 - 6.08
Risk-free rate	3.50 - 3.90%	3.03%	3.50 - 3.90%	1.38 - 3.03%

Restricted Stock

Stock award activity for employees and non-employees under the Equity Compensation Plans for the six months ended June 30, 2023 was as follows:

	Number of shares	Weighted Average Grant Date Fair Value
Unvested as of December 31, 2022	350,000	$ 1.72
Granted	318,875	$ 0.54
Vested	(75,000)	$ 1.72
Unvested as of June 30, 2023	593,875	$ 1.06

At June 30, 2023, the Company had an aggregate of $600 thousand of unrecognized equity-based compensation related to restricted stock units outstanding. As of June 30, 2023, the Company had 75 thousand restricted stock units vested but not issued. The unrecognized expense for restricted stock units is expected to be recognized within future operating results over a weighted average period of 3.34 years.

Stock-based compensation expense

Stock-based compensation expense for the three and six months ended June 30, 2023 and 2022 was as follows:

	Three Months Ended June 30,		Six Months Ended June 30,	
	2023	2022	2023	2022
Research and development	$ 166,534	$ 149,814	$ 314,225	$ 518,039
General and administrative	478,281	420,047	933,370	949,422
Total	$ 644,815	$ 569,861	$ 1,247,595	$ 1,467,461

(12) Fair Value Measurements

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. The following fair value hierarchy classifies the inputs to valuation techniques that would be used to measure fair value into one of three levels:

Level 1: Unadjusted quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly. These include quoted prices for similar assets or liabilities in active markets and quoted prices for identical or similar assets or liabilities in markets that are not active.

Level 3: Unobservable inputs that reflect the reporting entity's own assumptions.

The following tables present information about the Company's assets and liabilities that are measured at fair value on a recurring basis and indicate the fair value hierarchy of the valuation inputs the Company utilized to determine such fair value:

	As of June 30, 2023			
	Total	Quoted Prices In Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)
Liabilities:				
Public Warrant liability	$ 575,000	$ 575,000	$ —	$ —
Private Placement Warrant liability	20,860	—	—	20,860
Total	$ 595,860	$ 575,000	$ —	$ 20,860

	As of December 31, 2022			
	Total	Quoted Prices In Active Markets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Other Unobservable Inputs (Level 3)
Liabilities:				
Public Warrant liability	$ 310,500	$ 310,500	$ —	$ —
Private Placement Warrant liability	10,430	—	—	10,430
Total	$ 320,930	$ 310,500	$ —	$ 10,430

Public Warrants

Each whole Public Warrant entitles the holder to purchase one share of the Company's common stock at a price of $11.50 per share, subject to adjustment as discussed herein. The Public Warrants became exercisable 30 days after the Closing Date of the Business Combination and will expire five years after the Closing Date of the Business Combination, at 5:00 p.m., New York City time, or earlier upon redemption or liquidation.

Once the warrants become exercisable, the Company may call the warrants for redemption:

- in whole and not in part;
- at a price of $0.01 per warrant;
- upon not less than 30 days' prior written notice of redemption (the "30-day redemption period") to each warrant holder; and
- if, and only if, the reported last sale price of the common stock equals or exceeds $18.00 per share (as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like) for any 20 trading days within a 30-trading day period ending three business days before the Company send the notice of redemption to the warrant holders.

If the Company calls the warrants for redemption as described above, the management will have the option to require any holder that wishes to exercise its warrant to do so on a "cashless basis." If the management takes advantage of this option, all holders of warrants would pay the exercise price by surrendering their warrants for that number of shares of common stock equal to the quotient obtained by dividing (x) the product of the number of shares of common stock underlying the warrants, multiplied by the excess of the "fair market value" (defined below) over the exercise price of the warrants by (y) the fair market value. The "fair market value" shall mean the average reported last sale price of the common stock for the 10 trading days ending on the third trading day prior to the date on which the notice of redemption is sent to the holders of warrants.

As of June 30, 2023, an aggregate of 5,750,000 Public Warrants classified as liabilities were outstanding.

Private Placement Warrants

The private placement warrants (the "Private Placement Warrants") held by assignees of Big Cypress Holdings LLC, a Delaware limited liability company which acted as the Company's sponsor in connection with the IPO, and the common stock issuable upon the exercise of the Private Placement Warrants were not transferable, assignable or saleable until after the completion of the Company's Business Combination. Additionally, the Private Placement Warrants will be exercisable on a cashless basis and be non-redeemable so long as they are held by the initial purchasers or their permitted transferees. If the Private Placement Warrants are held by someone other than the initial purchasers or their permitted transferees, the Private Placement Warrants will be redeemable by the Company and exercisable by such holders on the same basis as the Public Warrants.

As of June 30, 2023, an aggregate of 208,600 Private Placement Warrants classified as liabilities were outstanding.

PIPE Warrants and PIPE Placement Agent Warrants

In December 2022, the Company entered into a Securities Purchase Agreement with certain institutional and accredited investors for the sale by the Company of 7,363,377 shares of common stock and warrants to purchase up to 7,363,377 shares of common stock (the "PIPE Warrants"), and in a private placement offering. The combined purchase price per share and accompanying PIPE Warrant was $1.08 (the "December Private Placement"). Three directors of the Company participated in the December Private Placement, each paying a $0.125 premium per share and accompanying PIPE Warrant. The PIPE Warrants, including those purchased by the participating directors of the Company are exercisable beginning six months from the date of issuance at an exercise price equal to $1.08 per Share, and are exercisable for five years from the date of issuance. The Company received gross proceeds of approximately $8.0 million before deducting transaction related fees and expenses. The Company paid Brookline Capital Markets, the placement agent, a cash fee equal to seven percent of the gross proceeds received by the Company in the December Private Placement. The Company also issued Brookline Capital Markets a warrant to purchase up to an aggregate of 210,913 shares of common stock (the "PIPE Placement Agent Warrants"), equal to 7% of the number of shares purchased by investors introduced to the Company by Brookline Capital Markets. The PIPE Placement Agent Warrants have an exercise price equal to $1.35 per share and are exercisable six months from the date of issuance and expires five years from the date of issuance.

As of June 30, 2023, 7,363,377 PIPE Warrants and 210,913 PIPE Placement Agent Warrants classified as equity were outstanding.

2023 Ladenburg Agreement Warrants

On March 21, 2023, the Company entered into a settlement agreement with Ladenburg Thalmann & Co. Inc. ("Ladenburg"), effective March 23, 2023 (the "2023 Ladenburg Agreement", and the action brought by Ladenburg, the "Ladenburg Action"). In connection with the 2023 Ladenburg Agreement, on March 24, 2023, the Company (i) issued to Ladenburg a warrant (the "Ladenburg Warrants") to purchase up to 300,000 shares of common stock, exercisable for three years from the date of issuance at $0.5424 per share; and (ii) furnished to Ladenburg a one-time cash payment of $500 thousand. Pursuant to the terms and subject to the conditions set forth in the 2023 Ladenburg Agreement, the Company will (i) no later than June 30, 2023, pay $1.5 million to Ladenburg in cash or shares of common stock, at the Company's option; and (ii) no later than December 31, 2023, pay $1.1 million to Ladenburg in cash or shares of common stock, at the Company's option. Following the completion of the Company's obligations under the 2023 Ladenburg Agreement, Ladenburg has agreed to dismiss the Ladenburg Action with prejudice and extinguish any and all obligations of the Company in connection therewith. All consideration contemplated by the 2023 Ladenburg Agreement are contained within accrued expenses and other current liabilities within the Company's consolidated balance sheet as of December 31, 2022. On June 30, 2023, the Company issued 1,916,894 shares of common stock to satisfy a portion of its obligations under the 2023 Ladenburg Agreement. As of June 30, 2023 there is $1.1 million of consideration remaining under the 2023 Ladenburg Agreement contained within accrued expenses and other current liabilities on the Company's consolidated balance sheet of June 30, 2023 and December 31, 2022.

As of June 30, 2023 , 300,000 Ladenburg Warrants classified as equity were outstanding.

Presentation and Valuation of the Warrants

Liability Classified Warrants

The Public Warrants and Private Placement Warrants are accounted for as liabilities in accordance with ASC 815-40, *Derivatives and Hedging—Contracts in Entity's Own Equity* and were presented within warrant liabilities on the consolidated balance sheet as of June 30, 2023 and December 31, 2022. The initial fair value of the warrant liabilities were measured at fair value at the Closing Date, and changes in the fair value of the warrant liabilities were presented within changes in fair value of warrant liabilities in the consolidated statements of operations for the three and six months ended June 30, 2023.

On the Closing Date, the Company established the fair value of the Private Placement Warrants utilizing both the Black-Scholes Merton formula and a Monte Carlo Simulation ("MCS") analysis. Specifically, the Company considered an MCS to derive the implied volatility in the publicly-listed price of the Public Warrants. The Company then considered this implied volatility in selecting the volatility for the application of a Black-Scholes Merton model for the Private Placement Warrants. The Company determined the fair value of the Public Warrants by reference to the quoted market price.

The Public Warrants were classified as a Level 1 fair value measurement, due to the use of the quoted market price, and the Private Placement Warrants held privately by assignees of Big Cypress Holdings LLC, were classified as a Level 3 fair value measurement, due to the use of unobservable inputs.

The following table provides a summary of the changes in Level 3 fair value measurements:

	June 30, 2023
Balance, December 31, 2022	$ 10,430
Change in fair value of Private Placement Warrant liability	(2,086)
Balance, March 31, 2023	$ 8,344
Change in fair value of Private Placement Warrant liability	12,516
Balance, June 30, 2023	$ 20,860

The key inputs into the valuations of the Company's Liability Classified Warrants as of June 30, 2023 and December 31, 2022 were as follows:

	June 30, 2023	December 31, 2022
Risk-free interest rate	4.43%	4.00%
Expected term remaining (years)	3.31	3.81
Implied volatility	90.0%	82.0%
Closing common stock price on the measurement date	$ 0.83	$ 0.59

As of June 30, 2023 and December 31, 2022, the Company did not have any other assets or liabilities that are recorded at fair value on a recurring basis.

The Company believes that the carrying amounts of its cash and cash equivalents, accounts receivable, and notes payable approximate their fair values due to their near-term maturities.

Equity Classified Warrants

The Company determined the Ladenburg Warrants, PIPE Warrants, and PIPE Placement Agent Warrants met all necessary criteria to be accounted for as equity in accordance with ASC 815-40, *Derivatives and Hedging—Contracts in Entity's Own Equity.* As such, they are presented within additional paid-in capital within Company's consolidated statements of changes in stockholders' equity and consolidated balance sheets.

Warrants classified as equity are initially measured at fair value. Subsequent changes in fair value are not recognized as long as the warrants continue to be classified as equity.

The initial fair value of each PIPE Warrant and PIPE Placement Agent Warrant issued was determined using the Black-Scholes option-pricing model. All relevant terms and conditions for the PIPE Warrant and PIPE Placement Agent Warrant are identical with the exception of the exercise prices of $1.08 and $1.35, respectively; the key inputs into the valuations as of the initial measurement date were as follows:

	Initial Measurement
Risk-free interest rate	3.62%
Expected term remaining (years)	5.00
Implied volatility	89.0%
Closing common stock price on the measurement date, less discount for lack of marketability (1)	$ 0.66

(1)As the underlying shares are restricted from sale for a period of 180 days from the date of the 2022 Private Placement, the fair value of the warrants were estimated using the Black-Scholes option pricing model that uses several inputs, including market price of the Company's common shares at the end of each reporting period (a level one input), less a discount for lack of marketability (a level two input). The discount for lack of marketability was estimated upon consideration of volatility and the length of the lock-up period.

Upon initial measurement, the fair value of the PIPE Warrants and PIPE Placement Agent Warrants were determined to be $0.42 and $0.39, respectively, per warrant for aggregate values of approximately $3.1 million and $82 thousand, respectively. In the Private Placement, the Company recognized the PIPE Warrants and PIPE Placement Agent Warrants on a relative fair value basis with approximately $2.2 million and $58 thousand being allocated to each as a component of additional paid-in capital within the Company's consolidated statements of changes in stockholders' equity and consolidated balance sheets as of December 31, 2022.

The initial fair value of each Ladenburg Warrant issued and exercisable at $0.5424 has been determined using the Black-Scholes option-pricing model. The key inputs into the valuations as of the 2023 Ladenburg Agreement initial measurement date were as follows:

	Initial Measurement
Risk-free interest rate	3.98%
Expected term remaining (years)	3.00
Implied volatility	94.0%
Closing common stock price on the measurement date	$ 0.52

Upon initial measurement, the fair value of each Ladenburg Warrant was determined to be $0.31, per warrant for a value of approximately $93 thousand. The total fair value of the Ladenburg Warrants was recognized by the company as a non-cash expense and allocated to additional paid-in capital within the Company's consolidated statement of changes in stockholders' equity and consolidated balance sheet.

(13) Income Taxes

The effective income tax rate for the second quarter of 2023 is 0.00%, compared with an effective tax rate of (0.20%) for the year ending December 31, 2023. The prior year tax rate reflects a tax provision on a pre-tax loss.

The Company continues to record a valuation allowance on its net deferred tax assets. The valuation increase by approximately $2.9 million for the six months ended June 30, 2023. The Company has not recognized any reserves for uncertain tax positions.

(14) Related Party Transactions

For the three and six months ended June 30, 2023 and 2022, under the Related Party Transaction Policy the Company adopted in the fourth quarter of 2021, there were no related party transactions with beneficial owners of 5% or more of any class of the Company's voting securities, immediate family members of any of the foregoing persons, and any entities in which any of the foregoing is an executive officer or is an owner of 5% or more ownership interest.

(15) Employee Benefit Plan

The Company sponsors a defined contribution retirement plan. All the Company's employees are eligible to be enrolled in the employer-sponsored contributory retirement savings plan, which include features under Section 401(k) of the Internal Revenue Code of 1986, as amended, and provides for Company matching contributions. The Company's contributions to the plan are determined by its Board of Directors, subject to certain minimum requirements specified in the plan. The Company has historically made matching contributions of 100% on 3% of the employee contributions, with an additional 50% match on the next 2% of employee contributions. The Company made contributions of approximately $64 thousand and $166 thousand, respectively, during the three months ended June 30, 2023 and 2022, and approximately $140 thousand and $259 thousand, respectively, during the six months ended June 30, 2023 and 2022.

(16) Commitments and Contingencies

The Company is not a party to any litigation, and, to its best knowledge, no action, suit, or proceeding has been threatened against the Company which are expected to have a material adverse effect on its financial condition, results of operations or liquidity.

(17) Subsequent Events

The Company has evaluated subsequent events through the date of issuance of these consolidated financial statements. The Company has no subsequent events that occurred that would require disclosure in, or would be recognized, in these consolidated financial statements.

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

You should read the following discussion and analysis of our financial condition and results of operations together with our consolidated financial statements and the accompanying notes included in Part I, Item 1 of this Form 10-Q. Some of the information contained in this discussion and analysis contains forward-looking statements that involve risks, uncertainties, and assumptions. As a result of many factors, including those factors set forth in the section titled "Risk Factors," our actual results could differ materially from those discussed in or implied by these forward-looking statements. Factors that could cause or contribute to such differences include, but are not limited to, those discussed in the section titled "Risk Factors." Please also refer to the section titled "Special Note Regarding Forward Looking Statements."

Special Note Regarding Forward-Looking Statements

This Quarterly Report on Form 10-Q (this "Quarterly Report" or "Form 10-Q") includes "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Exchange Act of 1934, as amended (the "Exchange Act"), as amended, that are not historical facts and involve risks and uncertainties that could cause actual results to differ materially from those expected and projected. All statements, other than statements of historical fact included in this Form 10-Q including, without limitation, statements in this "Management's Discussion and Analysis of Financial Condition and Results of Operations" regarding our financial position, business strategy and the plans and objectives of management for future operations, are forward-looking statements. Words such as "expect," "believe," "anticipate," "intend," "estimate," "seek" and variations and similar words and expressions are intended to identify such forward-looking statements. Such forward-looking statements involved known and unknown risks, including risks with regard to our ability to continue as a going concern, relate to future events or future performance, but reflect management's current beliefs, based on information currently available. A number of factors could cause actual events, performance or results to differ materially from the events, performance and results discussed in the forward-looking statements. In addition, historic results, including but not limited to those related to discovery data of SAB-195 and SAB-142; Phase 1 & Phase 2a results of SAB-176; and Phase 1, 1b, and 2 results for SAB-185 do not guarantee that future research or trials will suggest the same conclusions, nor that historic results referred to herein will be interpreted in the same manner due to future preclinical and clinical trial results or otherwise. For information identifying important factors that could cause actual results to differ materially from those anticipated in the forward-looking statements, please refer to the sections entitled "Risk Factors" in this Quarterly Report, our most recent Annual Report on Form 10-K, subsequent Quarterly Reports on Form 10-Q, and other periodic reports filed with the Securities and Exchange Commission and available at https://www.sec.gov/. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof. Except as expressly required by applicable law, we disclaim any intention or obligation to update or revise any forward-looking statements whether as a result of new information, future events or otherwise. Although we believe that the expectations reflected in the forward-looking statements are reasonable, we cannot guarantee future results, levels of activity, performance, or achievements.

Overview

We are a clinical-stage, biopharmaceutical company focused on the development of powerful and proprietary immunotherapeutic polyclonal human antibodies to treat and prevent infectious diseases and immune and autoimmune disorders, including infectious diseases resulting from outbreaks and pandemics as well as immunology, gastroenterology, and respiratory diseases that have significant mortality and health impacts on immunocompromised patients. We have applied advanced genetic engineering and antibody science to develop transchromosomic (Tc) Bovine™. Our versatile DiversitAb™ platform is applicable to a wide range of serious unmet needs in human diseases. It produces natural, specifically targeted, high-potency, fully-human polyclonal immunotherapies without the need for human donors. We currently have multiple drug development programs underway and collaborations with global pharmaceutical companies.

We are advancing clinical programs in two indications, and preclinical development in three indications. In addition, we are executing on two research collaborations with global pharmaceutical companies, including CSL Behring and an undisclosed collaboration.

We generated total revenue of $0.1 million and $6.4 million for the three months ended June 30, 2023 and 2022, respectively, and $0.7 million and $18.2 million for the six months ended June 30, 2023 and 2022, respectively. Our revenue to date has been primarily derived from government grants.

We plan to focus a substantial portion of our resources on continued research and development efforts towards deepening our technology and expertise with our platform and as well as indications in infectious disease and autoimmune indications. As a result, we expect to continue to make significant investments in these areas for the foreseeable future. We incurred research and development expenses of $3.7 million and $8.6 million for the three months ended June 30, 2023 and 2022, respectively, and $8.2 million and $21.9 million for the six months ended June 30, 2023 and 2022, respectively. We incurred general and administrative expenses of $2.9 million and $4.3 million for the three months ended June 30, 2023 and 2022, respectively, and $6.3 million and $9.5 million for the six months ended June 30, 2023 and 2022, respectively. We expect to continue to incur significant expenses, and we expect such expenses to increase substantially in connection with our ongoing activities, including as we:

- invest in research and development activities to optimize and expand our DiversitAb platform;
- develop new and advance preclinical and clinical progress of pipeline programs;
- market to and secure partners to commercialize our products;
- expand and enhance operations to deliver products, including investments in manufacturing;
- acquire businesses or technologies to support the growth of our business;
- continue to establish, protect and defend our intellectual property and patent portfolio;
- operate as a public company.

To date, we have primarily financed our operations from government agreements and the issuance and sale of common stock.

Our net loss for the three months ended June 30, 2023 and 2022 was $6.9 million and $4.8 million, respectively, and our net loss for the six months ended June 30, 2023 and 2022 was $14.2 million and $3.8 million, respectively. As of June 30, 2023, we had an accumulated deficit of $62.1 million with cash and cash equivalents totaling $7.8 million.

Key Factors Affecting Our Results of Operations and Future Performance

We believe that our financial performance has been, and in the foreseeable future will continue to be, primarily driven by multiple factors as described below, each of which presents growth opportunities for our business. These factors also pose important challenges that we must successfully address in order to sustain our growth and improve our results of operations. Our ability to successfully address these challenges is subject to various risks and uncertainties, including those described in the section captioned “Part I, Item 1A, Risk Factors” in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, and supplemented with the following revised or additional risk factors in “Part II, Item 1A, Risk Factors.”

Components of Results of Operations

Revenue

Our revenue has historically been generated through grants from government and other (non-government) organizations. We currently have no commercially approved products.

Grant revenue is recognized for the period that the research and development services occur, as qualifying expenses are incurred, or conditions of the grants are met. We concluded that payments received under these grants represent conditional, nonreciprocal contributions, as described in ASC 958, *Not-for-Profit Entities*, and that the grants are not within the scope of ASC 606, *Revenue from Contracts with Customers*, as the organizations providing the grants do not meet the definition of a customer. Expenses for grants are tracked by using a project code specific to the grant, and the employees also track hours worked by using the project code.

The total revenue for government grants was approximately $86 thousand and $667 thousand for the three and six months ended June 30, 2023, respectively, and approximately $6.4 million and $18.2 million, for the three and six months ended June 30, 2022, respectively.

NIH-NIAID (Federal Award #1R44AI117976-01A1) – this grant was for $1.4 million and started in September 2019 through August 2021. This grant was subsequently amended to extend the date through August 2022. No grant income was recognized for this grant for the three and six months ended June 30, 2023, and approximately $3 thousand and $30 thousand of grant income was recognized for the three and six months ended June 30, 2022, respectively. This grant was completed in 2022.

NIH-NIAID (Federal Award #1R41AI131823-02) – this grant was for approximately $1.5 million and started in April 2019 through March 2021. The grant was subsequently amended to extend the date through March 2023. No grant income was recognized for this grant for the three months ended June 30, 2023, and approximately $192 thousand of grant income was recognized for the six months ended June 30, 2023, and approximately $118 thousand and $131 thousand of grant income was recognized for the three and six months ended June 30, 2022, respectively. This grant was completed as of June 30, 2023.

NIH-NIAID through Geneva Foundation (Federal Award #1R01AI132313-01, Subaward #S-10511-01) – this grant was for approximately $2.7 million and started in August 2017 through July 2021. The grant was subsequently amended to extend the date through July 2023. Grant income recognized was approximately $37 thousand and $273 thousand for the three and six months ended June 30, 2023, respectively, and approximately $26 thousand and $49 thousand for the three and six months ended June 30, 2022, respectively. This grant was completed as of June 30, 2023.

DoD JPEO through Advanced Technology International – this grant was for a potential of $25 million, awarded in stages starting in August 2019 and with potential stages running through February 2023. Additional contract modifications were added to this contract in 2020 and 2021 for work on a COVID therapeutic, bringing the contract total to $203.6 million. Grant income recognized was approximately $44 thousand and $197 thousand for the three and six months ended June 30, 2023, respectively, and $6.2 million and $17.9 million for the three and six months ended June 30, 2022, respectively. This grant was terminated in 2022.

The grants for the JPEO Rapid Response contract are cost reimbursement agreements, with reimbursement of qualified direct research and development expense (labor and consumables) with an overhead charge (based on actual, reviewed quarterly) and a fixed fee (9%).

On August 3, 2022, we received the JPEO Rapid Response Contract Termination. We engaged in negotiations with the DoD to compensate us for services provided prior to the JPEO Rapid Response Contract Termination and costs we would be expected to bear in future periods. A termination and settlement proposal was submitted the DoD on September 9, 2022; we submitted a final invoice on December 15, 2022; and received payment from the DoD on or about January 12, 2023. The terms of the arrangement provide for a cost-reimbursable structure, and state that the parties will work in good faith equitable reimbursement for work performed toward accomplishment of the tasks provided in the agreement. At this time, other than certain deferred obligations (presented within deferred grant income within our consolidated unaudited balance sheet) potentially payable to the DoD solely due to subsequent negotiations with third-party vendors, we believes and have been advised there is a reasonable, good faith basis for the position that no present or future obligations exist. Revenue recognized subsequent to the JPEO Rapid Response Contract Termination relates to satisfaction of residual obligations under the termination and settlement agreement—see Note 2, *Summary of Significant Accounting Policies* for further information about our established revenue recognition process.

Operating Expenses

Research and Development Expenses

Research and development expenses primarily consist of salaries, benefits, incentive compensation, stock-based compensation, laboratory supplies and materials for employees and contractors engaged in research and product development, licensing fees to use certain technology in our research and development projects, fees paid to consultants and various entities that perform certain research and testing on our behalf. Research and development expenses are tracked by target/project code. Indirect general and administrative costs are allocated based upon a percentage of direct costs. We expense all research and development costs in the period in which they are incurred.

Research and development activities consist of discovery research for our platform development and the various indications we are working on. We have not historically tracked our research and development expenses on a product candidate-by-product candidate basis.

For the three and six months ended June 30, 2023 and 2022, we had contracts with multiple CRO to conduct and complete clinical studies. In the case of SAB-185, the CRO has been contracted and paid by the US government. For SAB-176, PPD Development, LP, acting as CRO oversaw the Phase 1 safety study. The terms of that agreement are subject to confidentiality, and the status of the agreement is that it is current, in good standing and 100% of the contract has been paid as of June 30, 2023. SAB has also contracted with hVIVO Services Limited to conduct the Phase 2a influenza study on SAB-176. The terms of that agreement are subject to confidentiality, and the status of the agreement is that it is current, in good standing and 100% of the contract has been paid as of June 30, 2023.

We expect to continue to incur substantial research and development expenses as we conduct discovery research to enhance our platform and work on our indications. We expect to hire additional employees and continue research and development and manufacturing activities. As a result, we expect that our research and development expenses will continue to increase in future periods and vary from period to period as a percentage of revenue.

Major components within our research and development expenses are salaries and benefits (laboratory & farm), laboratory supplies, animal care, contract manufacturing, clinical trial expense, outside laboratory services, project consulting, and facility expense. Our platform allows us to work on multiple projects with the same resources, as the research and development process of each product is very similar (with minimal differences in the manufacturing process).

Research and development expenses by component for the three and six months ended June 30, 2023 and 2022:

	Three Months Ended June 30,	
	2023	**2022**
Salaries & benefits	$ 1,653,081	$ 3,577,501
Laboratory supplies	177,736	1,859,280
Animal care	110,248	392,778
Contract manufacturing	—	354,530
Clinical trial expense	109,428	213,562
Outside laboratory services	205,168	704,578
Project consulting	62,526	118,395
Facility expense	1,328,621	1,323,200
Other expenses	15,322	40,603
Total research and development expenses	$ 3,662,130	$ 8,584,427

	Six Months Ended June 30,	
	2023	**2022**
Salaries & benefits	$ 3,369,111	$ 6,924,434
Laboratory supplies	567,363	3,798,613
Animal care	692,316	1,073,559
Contract manufacturing	—	4,783,733
Clinical trial expense	157,036	270,880
Outside laboratory services	368,374	1,887,392
Project consulting	290,625	553,178
Facility expense	2,666,809	2,559,991
Other expenses	86,217	95,912
Total research and development expenses	$ 8,197,851	$ 21,947,692

General and Administrative Expenses

General and administrative expenses primarily consist of salaries, benefits, and stock-based compensation costs for employees in our executive, accounting and finance, project management, corporate development, office administration, legal and human resources functions as well as professional services fees, such as consulting, audit, tax and legal fees, general corporate costs and allocated overhead expenses. General and administrative expenses also include rent and facilities expenses allocated based upon total direct costs. We expect that our general and administrative expenses will continue to increase in future periods, primarily due to increased headcount to support anticipated growth in the business and due to incremental costs associated with operating as a public company, including costs to comply with the rules and regulations applicable to companies listed on a securities exchange and costs related to compliance and reporting obligations pursuant to the rules and regulations of the SEC and stock exchange listing standards, public relations, insurance and professional services. We expect these expenses to vary from period to period in absolute terms and as a percentage of revenue.

Nonoperating (Expense) Income

Gain (loss) on change in fair value of warrant liabilities

Gain (loss) on change in fair value of warrant liabilities consists of the changes in the fair value of the warrant liabilities.

Interest income

Interest income consists of interest earned on cash balances in our bank accounts.

Interest expense

Interest expense consists primarily of interest related to borrowings under notes payable for equipment, abated rent, and insurance financing.

Income Tax Expense (Benefit)

Income tax expense (benefit) consists primarily of domestic federal and state income taxes.

Results of Operations

The following tables set forth our results of operations for the three months ended June 30, 2023 and 2022:

	Three Months Ended June 30,	
	2023	**2022**
Revenue		
Grant revenue	$ 85,518	$ 6,350,525
Total revenue	85,518	6,350,525
Operating expenses		
Research and development	3,662,130	8,584,427
General and administrative	2,900,006	4,309,042
Total operating expenses	6,562,136	12,893,469
Loss from operations	(6,476,618)	(6,542,944)
Other income (expense)		
Changes in fair value of warrant liabilities	(357,516)	1,730,080
Interest expense	(75,320)	(71,237)
Interest income	28,568	15,824
Total other income (expense)	(404,268)	1,674,667
Loss before income taxes	(6,880,886)	(4,868,277)
Income tax expense (benefit)	—	(92,281)
Net loss	$ (6,880,886)	$ (4,775,996)

The following tables set forth our results of operations for the six months ended June 30, 2023 and 2022:

	Six Months Ended June 30,	
	2023	**2022**
Revenue		
Grant revenue	$ 666,619	$ 18,153,601
Total revenue	666,619	18,153,601
Operating expenses		
Research and development	8,197,851	21,947,692
General and administrative	6,347,395	9,456,191
Total operating expenses	14,545,246	31,403,883
Loss from operations	(13,878,627)	(13,250,282)
Other income (expense)		
Changes in fair value of warrant liabilities	(274,930)	9,579,652
Interest expense	(167,705)	(143,259)
Interest income	86,556	23,757
Total other income (expense)	(356,079)	9,460,150
Loss before income taxes	(14,234,706)	(3,790,132)
Income tax expense (benefit)	—	—
Net loss	$ (14,234,706)	$ (3,790,132)

Comparison of the three and six months ended June 30, 2023 and 2022

Revenue

	Three Months Ended June 30,			
	2023	2022	Change	% Change
Revenue	$ 85,518	$ 6,350,525	$ (6,265,007)	(98.7)%
Total revenue	$ 85,518	$ 6,350,525		

Revenue decreased by $6.3 million, or 98.7%, in the three months ended June 30, 2023 as compared to the three months ended June 30, 2022, primarily due to the JPEO Rapid Response Contract Termination. Included in revenues for the three months ended June 30, 2023, are closeout activities and charges of $25 thousand for supplies, $56 thousand for outside research manufacturing services, and $4 thousand for license fee income, as compared to $3.4 million for labor, $2.5 million for supplies, $0.3 million for outside research manufacturing services, $0.2 million for animal purchases, and $0.1 million for license fee income for the three months ended June 30, 2022.

	Six Months Ended June 30,			
	2023	2022	Change	% Change
Revenue	$ 666,619	$ 18,153,601	$ (17,486,982)	(96.3)%
Total revenue	$ 666,619	$ 18,153,601		

Revenue decreased by $17.5 million, or 96.3%, in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to the JPEO Rapid Response Contract Termination. Included in revenues for the six months ended June 30, 2023, are closeout activities and charges of $151 thousand for labor, $70 thousand for supplies, $442 thousand for outside research manufacturing services, and $4 thousand for license fee income, as compared to $6.6 million for labor, $6.3 million for supplies, $0.4 million for animal purchases, $4.9 million for outside manufacturing services, and $0.1 million for license fee income for the six months ended June 30, 2022.

We anticipate future revenues will be substantially derived from current period directly reimbursable expenses such as laboratory supplies, labor costs, and consulting fees plus, when applicable, an overhead charge and a flat-rate fixed fee. As a result of the JPEO Rapid Response Contract Termination, we expect future revenues to be lower as our primary pipeline development targets of Clostridioides difficile Infection, influenza, and immune system disorders remain independently financed as we explore potential partnerships, co-development opportunities, and licensing arrangements.

Research and Development

	Three Months Ended June 30,			
	2023	2022	Change	% Change
Research and development	$ 3,662,130	$ 8,584,427	$ (4,922,297)	(57.3)%
Total research and development expenses	$ 3,662,130	$ 8,584,427		

Research and development expenses decreased by $4,900,000, or 57.3%, for the three months ended June 30, 2023 as compared to the three months ended June 30, 2022, primarily due to decreases in laboratory supplies (year-over-year decrease of $1.85 million, 53.8%), contract manufacturing costs (year-over-year decrease of $0.36 million, 100%), salaries and benefits (year-over-year decrease of $1.93 million, 53.8%), outside lab services due to the JPEO Rapid Response Contract Termination (year-over-year decrease of $0.5 million, 70.9%), project consulting (year-over-year decrease of $0.06 million, 47%) and overhead costs (year-over-year decrease of $0.26 million, 14.1%).

	Six Months Ended June 30,			
	2023	2022	Change	% Change
Research and development	$ 8,197,851	$ 21,947,692	$ (13,749,841)	(62.6)%
Total research and development expenses	$ 8,197,851	$ 21,947,692		

Research and development expenses decreased by $13,700,000, or 62.6%, for the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to decreases in laboratory supplies (year-over-year decrease of $3,400,000, 77.3%), contract manufacturing costs (year-over-year decrease of $4.8 million, 100%), salaries and benefits (year-over-year decrease of $3.55 million, 51.3%), outside lab services due to the JPEO Rapid Response Contract Termination (year-over-year decrease of $1.52 million, 80.5%), project consulting (year-over-year decrease of $0.31 million, 51.6%) and overhead costs (year-over-year decrease of $0.33 million, 9.5%).

The overall decrease in research and development expense was primarily due to targeted cost reduction measures pausing certain unfunded research activities for SAB-185, and prioritizing our earlier stage lead therapeutic candidates in Type 1 diabetes, respiratory, and gastrointestinal diseases. Future period research and development expenses will decrease relative to comparable prior periods as we no longer expect to incur costs of contract manufacturing, outside laboratory services, project consulting, and facilities costs related to the production of SAB-185.

General and Administrative

	Three Months Ended June 30,			
	2023	2022	Change	% Change
General and administrative	$ 2,900,006	$ 4,309,042	$ (1,409,036)	(32.7)%
Total general and administrative expenses	$ 2,900,006	$ 4,309,042		

General and administrative expenses decreased by $1.4 million, or 32.7%, in the three months ended June 30, 2023 as compared to the three months ended June 30, 2022, primarily due to insurance costs (year-over-year decrease of $0.46 million, 57.5%); salaries and benefits (year-over-year decrease of $0.93 million, 44.3%), project consulting (year-over-year decrease of $100,000, 37.0%), and other administrative support fees relating to IT, human resources, and legal (year-over-year increase of $0.04 million, 3.5%). The decrease was primarily due to discretionary cost reduction measures and increased efficiencies as we continue to mature as a publicly traded company.

	Six Months Ended June 30,			
	2023	2022	Change	% Change
General and administrative	$ 6,347,395	$ 9,456,191	$ (3,108,796)	(32.9)%
Total general and administrative expenses	$ 6,347,395	$ 9,456,191		

General and administrative expenses decreased by $3.1 million, or 32.9%, in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to insurance costs (year-over-year decrease of $800,000, 53.3%), salaries and benefits (year-over-year decrease of $1,800,000, 42.9%), project consulting (year-over-year decrease of $0.45 million, 53.6%), and other administrative support fees relating to IT, human resources, and legal (year-over-year decrease of $0.11 million, 3.8%). The decrease was primarily due to discretionary cost reduction measures and increased efficiencies as we continue to mature as a publicly traded company.

We anticipate that our general and administrative expenses will increase in the future as they relate to audit, legal, regulatory, and tax-related services associated with maintaining compliance with exchange listing and SEC requirements, director and officer liability insurance, investor relations costs and other costs associated with being a public company. Additionally, if and when we believe a regulatory approval of a product candidate appears likely, we anticipate an increase in staffing and related expenses as a result of our preparation for commercial operations, especially as it relates to the sales and marketing of our product candidates.

Non-operating Income (Expense)

	Three Months Ended June 30,			
	2023	2022	Change	% Change
Changes in fair value of warrant liabilities	$ (357,516)	$ 1,730,080	$ (2,087,596)	(120.7)%
Total non-operating expense	$ (357,516)	$ 1,730,080		

Total non-operating income (expense) decreased by $2.1 million, or 120.7%, in the three months ended June 30, 2023 as compared to the three months ended June 30, 2022 due to the change in fair value of warrant liabilities.

	Six Months Ended June 30,			
	2023	2022	Change	% Change
Changes in fair value of warrant liabilities	$ (274,930)	$ 9,579,652	$ (9,854,582)	(102.9)%
Total non-operating expense	$ (274,930)	$ 9,579,652		

Total non-operating income (expense) decreased by $9.9 million, or 102.9%, in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022 due to the change in fair value of warrant liabilities.

Interest Expense

	Three Months Ended June 30,			
	2023	2022	Change	% Change
Interest expense	$ 75,320	$ 71,237	$ 4,083	5.7%
Total interest expense	$ 75,320	$ 71,237		

Interest expense increased in the three months ended June 30, 2023 as compared to the three months ended June 30, 2022, driven by adding the 8% Unsecured Convertible Note.

	Six Months Ended June 30,			
	2023	2022	Change	% Change
Interest expense	$ 167,705	$ 143,259	$ 24,446	17.1%
Total interest expense	$ 167,705	$ 143,259		

Interest expense increased in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, driven by adding the 8% Unsecured Convertible Note.

Interest Income

	Three Months Ended June 30,			
	2023	2022	Change	% Change
Interest income	$ 28,568	$ 15,824	$ 12,744	80.5%
Total interest income	$ 28,568	$ 15,824		

Interest income increased by $13 thousand, or 80.5%, during the three months ended June 30, 2023 as compared to the three months ended June 30, 2022, primarily due to higher interest rates.

	Six Months Ended June 30,			
	2023	2022	Change	% Change
Interest income	$ 86,556	$ 23,757	$ 62,799	264.3%
Total interest income	$ 86,556	$ 23,757		

Interest income increased by $63 thousand, or 264.3% during the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to higher interest rates.

Liquidity and Capital Resources

As of June 30, 2023 and December 31, 2022, we had $7.8 million and $15.1 million, respectively, of cash and cash equivalents.

Our standard repayment terms for accounts receivable are thirty days from the invoice date. As a majority of our accounts receivable is from work performed under government grants, we have not had an uncollectible accounts receivable amount in over 5 years.

We intend to continue to invest in our business and, as a result, may incur operating losses in future periods. We expect to continue to invest in research and development efforts towards expanding our capabilities and expertise along our platform and the primary pipeline development targets we are working on, as well as building our business development team and marketing our solutions to partners in support of the growth of the business.

We anticipate that we will continue to generate losses for the foreseeable future, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for, our product candidates, and begin commercialization of our products. As a result, we will require additional capital to fund our operations in order to support our long-term plans, in particular, following the JPEO Rapid Response Contract Termination.

We have incurred operating losses for the past several years. While we intend to continue to keep operating expenses at a reduced level there can be no assurance that our current level of operating expenses will not increase or that other uses of cash will not be necessary. Based on our current level of operating expenses, existing cash and cash equivalents will not be sufficient to cover operating cash needs through the twelve months following the date these financials are made available for issuance. We intend to seek additional capital through equity and/or debt financings, collaborative or other funding arrangements. Should we seek additional financing from outside sources, we may not be able to raise such financing on terms acceptable to us or at all. If we are unable to raise additional capital when required or on acceptable terms, we may be required to scale back or discontinue the advancement of product candidates, reduce headcount, liquidate our assets, file for bankruptcy, reorganize, merge with another entity, or cease operations.

Sources of Liquidity

Since our inception, we have financed our operations primarily from revenue in the form of government grants and from equity financings.

Equity Financings and Option Exercises

As of June 30, 2023, we have raised approximately $90.2 million since our inception from the issuance and sale of convertible preferred shares, net of issuance costs associated with such financings, the Business Combination with BCYP, proceeds from the Private Placement, and exercises of employee stock options.

On May 9, 2023, we filed a shelf registration statement on Form S-3 (the “Shelf Registration Statement”). Whereby from time to time, we may offer and sell up to an aggregate of $50,000,000 of any combination of Common Stock, Preferred Stock, Debt Securities, Warrants, Rights, and Units, either individually or in combination. We may also offer common stock or preferred stock upon conversion of debt securities, common stock upon conversion of preferred stock, or common stock, preferred stock or debt securities upon the exercise of warrants. We may also issue units comprised of one or more shares of common stock, shares of preferred stock, debt securities, warrants and/or rights in any combination. The Shelf Registration Statement has not yet been declared effective by the Securities and Exchange Commission.

Notes payable

8% Unsecured Convertible Note

Pursuant to the Fourth Amendment to our lease with Sanford Health, we agreed to a period of Abated Rent from October 1, 2022 to September 30, 2023 pertaining to our leased laboratory bay at the Sanford Research Center. In exchange for the Abated Rent, effective as of October 1, 2022, we issued to Sanford Health an 8% unsecured, convertible promissory note (the “8% Unsecured Convertible Note”).

Pursuant to the 8% Unsecured Convertible Note, we shall pay the sum of approximately $542 thousand (the “Principal”) plus accrued and unpaid interest thereon on September 31, 2024 (the “Maturity Date”). Simple interest shall accrue on the outstanding Principal from and after the date of the October Note and shall be payable on the Maturity Date. Sanford Health shall have the right, but not the obligation, to convert all or any part of the outstanding Principal of the 8% Unsecured Convertible Note, together with any accrued and unpaid interest thereon to the date of such conversion, into such number of fully paid and non-assessable shares of our common stock, at any time and from time to time, prior to the later of the Maturity Date and the date on which the 8% Unsecured Convertible Note is paid in full, subject to certain restrictions, at a conversion price per share of Common Stock equal to greater of (x) $1.50 and (y) the price at which the we sells shares of common stock in any bona fide private or public equity financing prior to the Maturity Date.

Insurance Financing

We obtained financing for certain Director & Officer liability insurance policy premiums. The agreement assigns First Insurance Funding (Lender) a first priority lien on and security interest in the financed policies and any additional premium required in the financed policies including (a) all returned or unearned premiums, (b) all additional cash contributions or collateral amounts assessed by the insurance companies in relation to the financed policies and financed by Lender, (c) any credits generated by the financed policies, (d) dividend payments, and (e) loss payments which reduce unearned premiums. If any circumstances exist in which premiums related to any Financed Policy could become fully earned in the event of loss, Lender shall be named a loss-payee with respect to such policy.

The total premiums, taxes and fees financed is approximately $1.2 million with an annual interest rate of 5.47%. In consideration of the premium payment by Lender to the insurance companies or the Agent or Broker, we unconditionally promise to pay Lender the amount Financed plus interest and other charges permitted under the Agreement. At June 30, 2023 and December 31, 2022, we recognized approximately $112 thousand and $773 thousand, respectively, as insurance financing note payable in its consolidated balance sheet. We will pay the insurance financing through installment payments with the last payment being on September 22, 2023.

Please refer to Note 9, *Notes Payable*, in our consolidated unaudited financial statements for additional information on our debt.

Cash Flows

The following table summarizes our cash flows for the six months ended June 30, 2023 and 2022:

	Six Months Ended June 30,	
	2023	2022
Net cash used in operating activities	$ (6,504,873)	$ (13,985,767)
Net cash used in investing activities	(43,984)	(1,893,766)
Net cash used in financing activities	(723,578)	(7,048,992)
Net decrease in cash and cash equivalents	$ (7,272,435)	$ (22,928,525)

Operating Activities

Net cash used by operating activities decreased by $7.5 million in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to a decrease in non-cash working capital of $9.3 million offset by an increase in our net loss adjusted for non-cash items of $0.3 million. Year-over-year changes in cash used by operating activities is explained by shifts in the non-cash working capital balances as we continue to advance our lead programs after the JPEO Rapid Response Contract Termination.

Investing Activities

Net cash used by investing activities decreased by $1.8 million in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to a decrease in purchases of equipment. Capital asset purchases completed in 2022 relate substantially to leasehold improvements at the Corporate Headquarters and completion of the clinical manufacturing facility at the Sanford Research Center.

Financing Activities

Net cash used by financing activities decreased by $6.3 million in the six months ended June 30, 2023 as compared to the six months ended June 30, 2022, primarily due to the final settlement of the Forward Purchase Agreement whereby $5.5 million of restricted cash was utilized for a repurchase of 546,658 shares of our common stock in the six months ended June 30, 2022.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations and commitments as of June 30, 2023:

	Payments Due by Period				
	Total	Less than 1 year	1-3 years	3-5 years	Over 5 years
Notes payable	$ 653,538	$ 111,894	$ 541,644	$ —	$ —
Operating lease liabilities (1)	660,975	430,775	230,200	—	—
Finance lease liabilities (1)	6,189,730	401,496	802,992	802,992	4,182,250
Total	$ 7,504,243	$ 944,165	$ 1,574,836	$ 802,992	$ 4,182,250

(1) We are party to certain contractual arrangements for equipment, lab space, and an animal facility, which meet the definition of leases under FASB ASC Topic 842, *Leases* (“ASC 842”).

We enter into contracts in the normal course of business with third parties, including CROs. These payments are not included in the table above, as the amount and timing of such payments are not known.

As of June 30, 2023, there were no material changes outside of the ordinary course of business to our commitments and contractual obligations.

Income Taxes

The effective income tax rate for the second quarter of 2023 is 0.00%, compared with an effective tax rate of (0.20%) for the year ending December 31, 2023. The prior year tax rate reflects a tax provision on a pre-tax loss.

The Company continues to record a valuation allowance on its net deferred tax assets. The valuation increase by approximately $2.9 million for the six months ended June 30, 2023. The Company has not recognized any reserves for uncertain tax positions.

Going Concern

A fundamental principle of the preparation of financial statements in accordance with GAAP is the assumption that we will continue in existence as a going concern, which contemplates continuity of operations and the realization of assets and settlement of liabilities occurring in the ordinary course of business.

As of June 30, 2023, we have experienced net losses, negative cash flows from operations and had an accumulated deficit of $62.1 million. We anticipate to continue to generate losses for the foreseeable future, and expects the losses to increase as we continue the development of, and seek regulatory approvals for, product candidates, and begin commercialization of products. As a result, we will require additional capital to fund operations in order to support long-term plans, in particular, following the JPEO Rapid Response Contract Termination. These factors raise substantial doubt about our ability to continue as a going concern for the one-year period following the date that these financial statements were issued.

To continue as a going concern, we will need, among other things, to raise additional capital resources. We plan to seek additional funding through a combination of equity or debt financings, or other third-party financing, collaborative or other funding arrangements. Should we seek additional financing from outside sources, we may not be able to raise such financing on terms acceptable to us or at all. If we are unable to raise additional capital when required or on acceptable terms, we may be required to scale back or discontinue the advancement of product candidates, reduce headcount, liquidate our assets, file for bankruptcy, reorganize, merge with another entity, or cease operations.

The unaudited consolidated financial statements for June 30, 2023, have been prepared on the basis that we will continue as a going concern, and does not include any adjustments to reflect the possible future effects on the recoverability and classification of assets or the amounts and classification of liabilities that may result from the possible inability for us to continue as a going concern.

Off-Balance Sheet Arrangements

We did not have, for the periods presented, and we do not currently have, any off-balance sheet financing arrangements or any relationships with unconsolidated entities or financial partnerships, including entities sometimes referred to as structured finance or special purpose entities, that were established for the purpose of facilitating off-balance sheet arrangements or other contractually narrow or limited purposes.

Critical Accounting Policies and Estimates

We have prepared our consolidated financial statements in accordance with U.S. GAAP. Our preparation of these consolidated financial statements requires us to make estimates, assumptions and judgments that affect the reported amounts of assets, liabilities, revenue, expenses, and related disclosures. We evaluate our estimates and judgments on an ongoing basis. We base our estimates on historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying value of assets and liabilities that are not readily apparent from other sources. Actual results could therefore differ materially from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in Note 2 to our consolidated financial statements, *Summary of Significant Accounting Policies*, we believe the following accounting policies to be critical to the judgments and estimates used in the preparation of our consolidated financial statements.

Revenue Recognition

Our revenue is primarily generated through grants from government and other (non-government) organizations.

Grant revenue is recognized for the period that the research and development services occur, as qualifying expenses are incurred, or conditions of the grants are met. We concluded that payments received under these grants represent conditional, nonreciprocal contributions, as described in ASC 958, *Not-for-Profit Entities*, and that the grants are not within the scope of ASC 606, *Revenue from Contracts with Customers*, as the organizations providing the grants do not meet the definition of a customer. Expenses for grants are tracked by using a project code specific to the grant, and the employees also track hours worked by using the project code.

Stock-Based Compensation

We recognize compensation cost relating to stock-based payment transactions using a fair-value measurement method, which requires all stock-based payments to employees, directors, and non-employee consultants, including grants of stock options, to be recognized in operating results as compensation expense based on fair value over the requisite service period of the awards. Prior to the Business Combination, the grant date fair value of our common stock was typically determined by our board of directors with the assistance of management and a third-party valuation specialist. Subsequent to the Business Combination, the board of directors elected to determine the fair value of our post-merger common stock based on the closing market price at closing on the date of grant. In determining the fair value of our stock-based awards, we utilize the Black-Scholes option-pricing model, which uses both historical and current market data to estimate fair value. The Black-Scholes option-pricing model incorporates various assumptions, such as the value of the underlying common stock, the risk-free interest rate, expected volatility, expected dividend yield, and expected life of the options. For awards with performance-based vesting criteria, we estimate the probability of achievement of the performance criteria and recognize compensation expense related to those awards expected to vest. No awards may have a term in excess of ten years. Forfeitures are recorded when they occur. Stock-based compensation expense is classified in our consolidated statements of operations based on the function to which the related services are provided. We recognize stock-based compensation expense over the expected term.

In addition to considering the results of the independent third-party valuations, our board of directors considered various objective and subjective factors to determine the fair value of our common shares as of each grant date, which may be a date other than the most recent independent third-party valuation date, including:

- the prices at which we most-recently sold preferred shares and the superior rights and preferences of the preferred shares relative to our common shares at the time of each grant;
- the lack of liquidity of our equity as a private company;
- our stage of development and business strategy and the material risks related to our business and industry;
- our financial condition and operating results, including our levels of available capital resources and forecasted results;
- developments in our business, including the achievement of milestones such as entering into partnering agreements;
- the valuation of publicly traded companies in the life sciences, biopharmaceutical and healthcare technology sectors, as well as recently completed mergers and acquisitions of peer companies;
- any external market conditions affecting our industry, and trends within our industry;
- the likelihood of achieving a liquidity event for the holders of our preferred shares and holders of our common shares, such as an initial public offering, or IPO, or a sale of our company, given prevailing market conditions; and
- the analysis of IPOs and the market performance of similar companies in our industry.

The assumptions underlying these valuations represented management's best estimates, which involved inherent uncertainties and the application of management's judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, the fair value of our common shares and our stock-based compensation expense could be materially different.

See Note 11, *Stock Option Plan*, to our consolidated financial statements for information concerning certain specific assumptions we used in applying the Black-Scholes option pricing model to determine the estimated fair value of our stock options granted for the three and six months ended June 30, 2023 and 2022.

Stock-based compensation expense was $0.6 million and $0.6 million, respectively, for the three months ended June 30, 2023 and 2022, and $1.2 million and $1.5 million for the six months ended June 30, 2023 and 2022, respectively.

As of June 30, 2023, we had $4.2 million of total unrecognized stock-based compensation cost related to non-vested options, which we expect to recognize in future operating results over a weighted-average period of 3.34 years. Total unrecognized compensation cost related to non-vested restricted stock awards as of June 30, 2023,was approximately $0.6 million and is expected to be recognized within future operating results over a weighted-average period of 3.34 years. As of June 30, 2023, the Company had 75 thousand restricted stock units vested but not issued.

Warrant Liabilities Valuations

Liability Classified Warrants

We are required to periodically estimate the fair value of our Private Placement Warrant liabilities with the assistance of an independent third-party valuation firm. The assumptions underlying these valuations represented our best estimates, which involved inherent uncertainties and the application of significant levels of our judgment. The fair value of our Public Warrant liabilities are determined by reference to the quoted market price.

The warrants are accounted for as liabilities in accordance with ASC 815-40, *Derivatives and Hedging—Contracts in Entity's Own Equity*, and were presented within warrant liabilities on the consolidated balance sheets as of June 30, 2023 and December 31, 2022. The initial fair value of the warrant liabilities were measured at fair value on the Closing Date, and changes in the fair value of the warrant liabilities were presented within changes in fair value of warrant liabilities in the consolidated statements of operations for the six months ended June 30, 2023 and 2022.

On the Closing Date, we established the fair value of the Private Placement Warrants utilizing both the Black-Scholes Merton formula and a MCS analysis. Specifically, we considered a MCS to derive the implied volatility in the publicly listed price of the Public Warrants. We then considered this implied volatility in selecting the volatility for the application of a Black-Scholes Merton model for the Private Placement Warrants. We determined the fair value of the Public Warrants by reference to the quoted market price.

The Public Warrants were classified as a Level 1 fair value measurement, due to the use of the quoted market price, and the Private Placement Warrants held privately by assignees of Big Cypress Holdings LLC, were classified as a Level 3 fair value measurement, due to the use of unobservable inputs.

The measurement as of June 30, 2023 and December 31, 2022 for the Private Placement Warrant liability was approximately $20 thousand and $10 thousand, respectively, and the change in fair value of the Private Placement Warrant liability was approximately $2 thousand and $12 thousand, respectively, the three and six months ended June 30, 2023.

The key inputs into the valuations as of the June 30, 2023 and December 31, 2022 were as follows:

	June 30, 2023	December 31, 2022
Risk-free interest rate	4.43%	4.00%
Expected term remaining (years)	3.31	3.81
Implied volatility	90.0%	82.0%
Closing common stock price on the measurement date	$ 0.83	$ 0.59

Equity Classified Warrants

On December 7, 2022, as a part of our 2022 Private Placement, we issued PIPE Warrants to investors to purchase up to 7,363,377 shares of Common Stock. The PIPE Warrants, including those purchased by the participating directors of SAB are exercisable beginning six months from the date of issuance at an exercise price equal to $1.08 per share, and are exercisable for five years from the date of issuance. We also issued our placement agent, Brookline Capital Markets, PIPE Placement Agent Warrants to purchase up to an aggregate of 210,913 shares of Common Stock. The Placement Agent Warrants have an exercise price equal to $1.35 per share and are exercisable six months from the date of issuance and expires five years from the date of issuance.

On March 21, 2023, we entered into a settlement agreement with Ladenburg (the "2023 Ladenburg Agreement"), effective March 23, 2023. In connection with the 2023 Ladenburg Agreement, on March 24, 2023, we issued to Ladenburg a warrant to purchase up to 300,000 shares of common stock, exercisable for three years from the date of issuance at $0.5424 per share.

We determined the Ladenburg Warrants, PIPE Warrants, and PIPE Placement Agent Warrants met all necessary criteria to be accounted for as equity in accordance with ASC 815-40, *Derivatives and Hedging—Contracts in Entity's Own Equity.* As such, they are presented within additional paid-in capital within our consolidated statements of changes in stockholders' equity and consolidated balance sheets.

Warrants classified as equity are initially measured at fair value. Subsequent changes in fair value are not recognized as long as the warrants continue to be classified as equity.

The initial fair value of each PIPE Warrant and PIPE Placement Agent Warrant issued was determined using the Black-Scholes option-pricing model. All relevant terms and conditions for the PIPE Warrant and PIPE Placement Agent Warrant are identical with the exception of the exercise prices of $1.08 and $1.35, respectively; the key inputs into the valuations as of the initial measurement date were as follows:

	Initial Measurement
Risk-free interest rate	3.62%
Expected term remaining (years)	5.00
Implied volatility	89.0%
Closing common stock price on the measurement date, less discount for lack of marketability (1)	$ 0.66

(1) As the underlying shares are restricted from sale for a period of 180 days from the date of the 2022 Private Placement, the fair value of the warrants were estimated using the Black-Scholes option pricing model that uses several inputs, including market price of our common shares at the end of each reporting period (a level one input), less a discount for lack of marketability (a level two input). The discount for lack of marketability was estimated upon consideration of volatility and the length of the lock-up period.

Upon initial measurement, the fair value of the PIPE Warrants and PIPE Placement Agent Warrants were determined to be $0.42 and $0.39, respectively, per warrant for aggregate values of approximately $3.1 million and $82 thousand, respectively. In the Private Placement, we recognized the PIPE Warrants and PIPE Placement Agent Warrants on a relative fair value basis with approximately $2.2 million and $58 thousand being allocated to each as a component of additional paid-in capital within our consolidated statements of changes in stockholders' equity and consolidated balance sheets as of December 31, 2022.

The initial fair value of each Ladenburg Warrant issued has been determined using the Black-Scholes option-pricing model. The key inputs into the valuations as of the 2023 Ladenburg Agreement initial measurement date were as follows:

	Initial Measurement
Risk-free interest rate	3.98%
Expected term remaining (years)	3.00
Implied volatility	94.0%
Closing common stock price on the measurement date	$ 0.52

Upon initial measurement, the fair value of each Ladenburg Warrant was determined to be $0.31, per warrant for a total value of approximately $93 thousand. The total fair value of the Ladenburg Warrants was recognized as a non-cash expense and allocated to additional paid-in capital within our consolidated statement of changes in stockholders' equity and consolidated balance sheet.

See Note 12, *Fair Value Measurements*, to our consolidated financial statements for information concerning certain specific assumptions we used in applying the Black-Scholes Merton formula and MCS to determine the estimated fair value of the Private Placement Warrants outstanding as of June 30, 2023.

Common Stock Valuations

Prior to becoming a public company, we were required to periodically estimate the fair value of our common stock with the assistance of an independent third-party valuation firm, as discussed above, when issuing stock options and computing our estimated stock-based compensation expense. The assumptions underlying these valuations represented our best estimates, which involved inherent uncertainties and the application of significant levels of our judgment. In order to determine the fair value of our common stock, we considered, among other items, previous transactions involving the sale of our securities, our business, financial condition and results of operations, economic and industry trends, the market performance of comparable publicly traded companies, and the lack of marketability of our common stock.

Subsequent to the Business Combination, we now determine the fair value of our common stock based on the closing market price at closing on the date of grant.

Compensation expense related to stock-based transactions is measured and recognized in the financial statements at fair value of our post-merger common stock based on the closing market price at closing on the date of grant. Stock-based compensation expense is measured at the grant date based on the fair value of the equity award and is recognized as expense over the requisite service period, which is generally the vesting period, on the straight-line method. We estimate the fair value of each stock option award on the date of grant using the Black-Scholes option-pricing model. Determining the fair value of stock option awards at the grant date requires judgment, including estimating the expected volatility, expected term, risk-free interest rate, and expected dividends.

Lease Liabilities and Right-of-Use Assets

We are party to certain contractual arrangements for equipment, lab space, and an animal facility, which meet the definition of leases under ASC 842. In accordance with ASC 842, we, as of January 1, 2018 (the date of adoption), recorded right-of-use assets and related lease liabilities for the present value of the lease payments over the lease terms. We utilized the practical expedient regarding lease and non-lease components and have combined such items into a single combined component. Our IBR was used in the calculation of our right-of-use assets and lease liabilities.

Recently Issued Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 3, *New Accounting Standards* to our consolidated financial statements.

JOBS Act Accounting Election

We qualify as an "emerging growth company" as defined in the JOBS Act. An emerging growth company may take advantage of reduced reporting requirements that are not otherwise applicable to public companies. These provisions include, but are not limited to:

- being permitted to present only two years of audited financial statements and only two years of related Management's Discussion and Analysis of Financial Condition and Results of Operations in this Form 10-Q;
- not being required to comply with the auditor attestation requirements on the effectiveness of our internal controls over financial reporting;
- not being required to comply with any requirement that may be adopted by the PCAOB regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements (auditor discussion and analysis);
- reduced disclosure obligations regarding executive compensation arrangements; and
- exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We may use these provisions until the last day of our fiscal year in which the fifth anniversary of the completion of our initial public offering occurred. However, if certain events occur prior to the end of such five-year period, including if we become a "large accelerated filer," our annual gross revenue exceeds $1.235 billion, or we issue more than $1.0 billion of non-convertible debt in any three-year period, we will cease to be an emerging growth company prior to the end of such five-year period.

We have elected to take advantage of certain of the reduced disclosure obligations in this Form 10-Q and may elect to take advantage of other reduced reporting requirements in future filings. As a result, the information that we provide to our shareholders may be different than the information you receive from other public companies in which you hold stock.

The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards, until those standards apply to private companies. We have elected to take advantage of the benefits of this extended transition period and, therefore, we will not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies. Our financial statements may therefore not be comparable to those of companies that comply with such new or revised accounting standards. Until the date that we are no longer an emerging growth company or affirmatively and irrevocably opt out of the exemption provided by Section 7(a)(2)(B) of the Securities Act upon issuance of a new or revised accounting standard that applies to our financial statements and that has a different effective date for public and private companies, we will disclose the date on which we will adopt the recently issued accounting standard.

Item 3. Quantitative and Qualitative Disclosures About Market Risk.

Concentration of Credit Risk

We received 100% and of our total revenue through grants from government organizations for the three and six months ended June 30, 2023 and 2022, respectively. To date, no receivables have been written off.

Interest Rate Risk

As of June 30, 2023 and December 31, 2022, we had a cash and cash equivalents of $7.8 million and $15.0 million, respectively, all of which was maintained in bank accounts and money market funds in the U.S. Our primary exposure to market risk is to interest income volatility, which is affected by changes in the general level of interest rates. A 10% change in the market interest rates would not have a material effect on our business, financial condition, or results of operations.

Foreign Currency Risk

We conduct our business in U.S. dollars and, thus, are not exposed to financial risks from exchange rate fluctuations between the U.S. dollar and other currencies.

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. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the Company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure.

Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost benefit relationship of possible controls and procedures. Based on the evaluation as of June 30, 2023, our Chief Executive Officer and Chief Financial Officer have concluded that the Company’s disclosure controls and procedures were not effective as of June 30, 2023. Management has concluded that there is a material weakness in the design and operating effectiveness of the Company’s review controls surrounding technical accounting matters and significant and/or unusual transactions.

Plan for Remediation of Material Weakness

We continue to work to strengthen our internal control over financial reporting and are committed to ensuring that such controls are designed and operating effectively. We are implementing process and control improvements to address the above material weakness as follows:

- We have supplemented existing accounting resources with external advisors to assist with performing certain technical accounting activities. We have hired an additional full-time employee with technical accounting expertise and public company experience. Management will continue to supplement existing internal resources as needed. In addition, Management will continue to review the qualifications of our finance organization to ensure our personnel have the appropriate technical and SOX related expertise.
- We have begun the process of implementing a contract management platform that will integrate functions governing the initiation, authorization, and execution of contracts with enhancements for our existing contract review control. This tool will improve the ability of the finance organization to review new and renewed contracts for potential financial reporting implications.

We are committed to continuing to improve our internal control processes related to these matters and will continue to review our financial reporting controls and procedures. As we continue to evaluate and work to improve our internal control over financial reporting, we may take additional measures to address deficiencies or modify certain of the remediation measures described above. The elements of our remediation plan can only be accomplished over time, and we can offer no assurance that these initiatives will ultimately have the intended effects.

Changes in Internal Control Over Financial Reporting

Other than as described above, there have been no changes in our internal control over financial reporting that occurred during the period covered by this report that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings.

We are not currently a party to any material litigation, nor are we aware of any pending or threatened litigation against us that we believe would materially affect our business, operating results, financial condition, or cash flows. Participants in our industry face frequent claims and litigation, including securities litigation, claims regarding patent and other intellectual property rights, and other liability claims. As a result, we may be involved in various legal proceedings from time to time in the future.

Item 1A. Risk Factors.

The risk factors described in the section captioned "Part I, Item 1A, Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, are incorporated herein, and supplemented with the following revised or additional risk factors:

We are a clinical-stage biopharmaceutical company and have incurred significant losses since our inception. We realized net loss in the fiscal year ended December 31, 2022 and the interim period through June 30, 2023, we may incur losses for the foreseeable future and may not be able to generate sufficient revenue to maintain profitability.

We are a clinical-stage biopharmaceutical company. We expect to experience variability in revenue and expenses which makes it difficult to evaluate our business and prospects. As such, we have incurred and anticipate that we will continue to incur significant operating losses in the foreseeable future. Our historical losses resulted principally from costs incurred in research and development, preclinical testing, clinical development of product candidates as well as costs incurred for research programs and from general and administrative costs associated with these operations. In the future, we intend to continue to conduct research and development, preclinical testing, clinical trials, and regulatory compliance activities that, together with anticipated general and administrative expenses, will result in incurring further significant losses for the next several years. We expect that our operating expenses will continue to increase significantly, including as we:

- continue the research and development of our clinical - and preclinical-stage product candidates and discovery stage programs, including the clinical trials of SAB 176;
- advance our preclinical-stage candidates into clinical development;
- invest in our technology and platform;
- seek to identify, acquire and develop additional product candidates, including through business development efforts to invest in our in-license other technologies or product candidates;
- seek regulatory approvals for any product candidates that successfully complete clinical trials;
- market and sell our solutions to existing and new partners;
- hire additional clinical, quality control, medical, scientific and other technical personnel to support our operations;
- maintain, expand, enforce, protect, and defend our intellectual property portfolio;
- create additional infrastructure to support operations;
- add operational, financial, and management information systems and personnel to support operations as a public company;
- undertake any pre-commercialization activities to establish sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own or jointly with third parties; and
- experience any delays or encounter issues with any of the above.

Biopharmaceutical product development entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate efficacy or an acceptable safety profile, gain regulatory approval, secure market access and reimbursement and become commercially viable, and therefore any investment in us is highly speculative. Accordingly, before making an investment in us, you should consider our prospects, factoring in the costs, uncertainties, delays, and difficulties frequently encountered by companies in clinical development, especially clinical-stage biopharmaceutical companies such as ours. Any predictions you make about our future success or viability may not be as accurate as they would otherwise be if we had a longer operating history or a history of successfully developing and commercializing pharmaceutical products. We may encounter unforeseen expenses, difficulties, complications, delays and other known or unknown factors in achieving our business objectives.

Our expenses could increase beyond expectations for a variety of reasons, including as a result of our growth strategy and the increase in the scope and complexity of our operations. In executing our strategy and plans to invest in enhancing and scaling our business, we will need to generate significant additional revenue to achieve and maintain future profitability. We may not be able to generate sufficient revenue to achieve profitability and our recent and historical growth should not be considered indicative of future performance.

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

None.

Item 3. Defaults Upon Senior Securities.

None.

Item 4. Mine Safety Disclosures.

Not Applicable.

Item 5. Other Information.

Not Applicable.

Item 6. Exhibits.

Exhibit Number	Description	Schedule/ Form	File No.	Exhibit	Filing Date
4.1	Form of Warrant	S-3	333-271543	4.2	May 1, 2023
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	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because 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 (embedded within the Inline XBRL and contained in Exhibit 101)				

* Filed herewith.

¥ Denotes management contract or any compensatory plan, contract or arrangement.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, as amended, the Registrant has duly caused this Report to be signed on its behalf by the undersigned, thereunto duly authorized**.**

SAB BIOTHERAPEUTICS, INC.

Date: August 21, 2023

By: */s/ Eddie J. Sullivan*

Eddie J. Sullivan
Chief Executive Officer
(Principal Executive Officer)

By: */s/ Russell Beyer*

Russell Beyer
Chief Financial Officer
(Principal Financial Officer and Principal 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, Eddie J. Sullivan, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of SAB Biotherapeutics, 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 small business issuer as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) 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 small business issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the small business issuer'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: August 21, 2023

By: /s/ Eddie J. Sullivan

Eddie J. Sullivan
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, Russell Beyer, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of SAB Biotherapeutics, 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 small business issuer as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) 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 small business issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the small business issuer'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: August 21, 2023

By: /s/ Russell Beyer

Russell Beyer
Chief Financial Officer
(Principal Financial and Accounting Officer)

Exhibit 32.1

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

In connection with the Quarterly Report of SAB Biotherapeutics, Inc. (the "Company") on Form 10-Q for the period ending June 30, 2023 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 results of operations of the Company.

Date: August 21, 2023

By: /s/ Eddie J. Sullivan

Eddie J. Sullivan
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 SAB Biotherapeutics, Inc. (the "Company") on Form 10-Q for the period ending June 30, 2023 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 results of operations of the Company.

Date: August 21, 2023

By: /s/ Russell Beyer

Russell Beyer
Chief Financial Officer
(Principal Financial and Accounting Officer)