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 March 31, 2024

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: 001-38957

ADAPTIVE BIOTECHNOLOGIES CORPORATION
(Exact Name of Registrant as Specified in its Charter)

Washington	**27-0907024**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**
1165 Eastlake Avenue East Seattle, Washington	**98109**
(Address of principal executive offices)	**(Zip Code)**

Registrant's telephone number, including area code: (206) 659-0067

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

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock, par value $0.0001 per share	ADPT	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, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

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

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

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

As of May 2, 2024, the registrant had 147,368,324 shares of common stock, $0.0001 par value per share, outstanding.

Table of Contents

FORWARD-LOOKING STATEMENTS

This report contains forward-looking statements that are based on management's beliefs and assumptions and on information currently available to management. All statements contained in this report other than statements of historical fact are forward-looking statements, which include but are not limited to, statements about:

- our ability to leverage and extend our immune medicine platform to discover, develop and commercialize our products and services, including further commercialization and development of products and services related to our Minimal Residual Disease ("MRD") and Immune Medicine business areas, particularly in light of the novelty of immune medicine and our methods;
- our ability to achieve and maintain commercial market acceptance of our current products and services, such as clonoSEQ and Adaptive Immunosequencing, as well as our ability to achieve market acceptance for any additional products and services beyond our current portfolio, if developed;
- our collaboration with Genentech, Inc. ("Genentech") and our ability to develop and commercialize cellular therapeutics, including our ability to achieve milestones and realize the intended benefits of the collaboration;
- our ability to realize payments, such as milestone fees, based on our customers' use of our technologies in connection with their achievement of research or regulatory goals relating to their own products;
- our ability to develop a comprehensive map of the interaction between the immune system and disease (the "TCR-Antigen Map") and yield insights from it that are commercially viable; and
- our expected reliance on collaborators and other third parties for development, clinical testing and regulatory approval of current products in new indications and potential product candidates, which may fail at any time due to a number of possible unforeseen events.

The forward-looking statements in this report also include statements regarding our ability to develop, commercialize and achieve market acceptance of our current and planned products and services, our research and development efforts and other matters regarding our business strategies, use of capital, results of operations and financial position and plans and objectives for future operations. In some cases, you can identify forward-looking statements by the words "may," "will," "could," "would," "should," "expect," "intend," "plan," "anticipate," "believe," "estimate," "predict," "project," "potential," "continue," "ongoing" or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words. These statements involve risks, uncertainties and other factors that may cause actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. These risks, uncertainties and other factors are described under "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and elsewhere in this report and in other documents we file with the Securities and Exchange Commission (the "SEC") from time to time. We caution you that forward-looking statements are based on a combination of facts and factors currently known by us and our projections of the future, about which we cannot be certain. As a result, the forward-looking statements may not prove to be accurate. The forward-looking statements in this report represent our views as of the date of this report.

We undertake no obligation to update any forward-looking statements for any reason, except as required by law.

Unless otherwise stated or the context otherwise indicates, references to "we," "us," "our" and similar references refer to Adaptive Biotechnologies Corporation.

PART I—FINANCIAL INFORMATION

Item 1. Financial Statements (Unaudited)

Condensed Consolidated Balance Sheets
(in thousands, except share and per share amounts)

	March 31, 2024 (unaudited)	December 31, 2023
Assets		
Current assets		
Cash and cash equivalents	$ 71,233	$ 65,064
Short-term marketable securities (amortized cost of $237,745 and $281,122, respectively)	237,639	281,337
Accounts receivable, net	42,021	37,969
Inventory	13,291	14,448
Prepaid expenses and other current assets	9,850	11,370
Total current assets	374,034	410,188
Long-term assets		
Property and equipment, net	65,260	68,227
Operating lease right-of-use assets	50,999	52,096
Restricted cash	2,963	2,932
Intangible assets, net	4,705	5,128
Goodwill	118,972	118,972
Other assets	3,390	3,591
Total assets	$ 620,323	$ 661,134
Liabilities and shareholders' equity		
Current liabilities		
Accounts payable	$ 12,170	$ 7,719
Accrued liabilities	7,914	8,597
Accrued compensation and benefits	6,404	13,685
Current portion of operating lease liabilities	9,594	9,384
Current portion of deferred revenue	46,870	48,630
Total current liabilities	82,952	88,015
Long-term liabilities		
Operating lease liabilities, less current portion	86,900	89,388
Deferred revenue, less current portion	44,160	44,793
Revenue interest liability, net	131,545	130,660
Total liabilities	345,557	352,856
Commitments and contingencies (Note 9)		
Shareholders' equity		
Preferred stock: $0.0001 par value, 10,000,000 shares authorized at March 31, 2024 and December 31, 2023; no shares issued and outstanding at March 31, 2024 and December 31, 2023	—	—
Common stock: $0.0001 par value, 340,000,000 shares authorized at March 31, 2024 and December 31, 2023; 147,368,324 and 145,082,271 shares issued and outstanding at March 31, 2024 and December 31, 2023, respectively	14	14
Additional paid-in capital	1,466,844	1,452,502
Accumulated other comprehensive (loss) gain	(106)	215
Accumulated deficit	(1,191,839)	(1,144,332)
Total Adaptive Biotechnologies Corporation shareholders' equity	274,913	308,399
Noncontrolling interest	(147)	(121)
Total shareholders' equity	274,766	308,278
Total liabilities and shareholders' equity	$ 620,323	$ 661,134

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

Adaptive Biotechnologies Corporation

Condensed Consolidated Statements of Operations
(in thousands, except share and per share amounts)
(unaudited)

	Three Months Ended March 31,	
	2024	2023
Revenue	$ 41,873	$ 37,647
Operating expenses		
Cost of revenue	18,051	18,681
Research and development	30,245	32,601
Sales and marketing	22,319	22,308
General and administrative	19,597	20,831
Amortization of intangible assets	423	419
Total operating expenses	90,635	94,840
Loss from operations	(48,762)	(57,193)
Interest and other income, net	4,222	3,024
Interest expense	(2,993)	(3,531)
Net loss	(47,533)	(57,700)
Add: Net loss attributable to noncontrolling interest	26	1
Net loss attributable to Adaptive Biotechnologies Corporation	$ (47,507)	$ (57,699)
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.33)	$ (0.40)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	145,787,527	143,511,142

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

Adaptive Biotechnologies Corporation

Condensed Consolidated Statements of Comprehensive Loss
(in thousands)
(unaudited)

	Three Months Ended March 31,	
	2024	2023
Net loss	$ (47,533)	$ (57,700)
Other comprehensive (loss) income		
Change in unrealized gains and losses on investments	(321)	2,211
Comprehensive loss	(47,854)	(55,489)
Add: Comprehensive loss attributable to noncontrolling interest	26	1
Comprehensive loss attributable to Adaptive Biotechnologies Corporation	$ (47,828)	$ (55,488)

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

Adaptive Biotechnologies Corporation

Condensed Consolidated Statements of Shareholders' Equity
(in thousands, except share amounts)
(unaudited)

	Common Stock		Additional	Accumulated Other	Accumulated	Noncontrolling	Total
	Shares	Amount	Paid-In Capital	Comprehensive (Loss) Gain	Deficit	Interest	Shareholders' Equity
Balance at December 31, 2022	143,105,002	$ 14	$ 1,387,349	$ (4,116)	$ (919,082)	$ (67)	$ 464,098
Issuance of common stock for cash upon exercise of stock options	145,758	—	672	—	—	—	672
Vesting of restricted stock units	1,029,209	—	—	—	—	—	—
Share-based compensation expense	—	—	14,671	—	—	—	14,671
Other comprehensive income	—	—	—	2,211	—	—	2,211
Net loss	—	—	—	—	(57,699)	(1)	(57,700)
Balance at March 31, 2023	144,279,969	$ 14	$ 1,402,692	$ (1,905)	$ (976,781)	$ (68)	$ 423,952
Balance at December 31, 2023	145,082,271	$ 14	$ 1,452,502	$ 215	$ (1,144,332)	$ (121)	$ 308,278
Issuance of common stock for cash upon exercise of stock options	30,900	—	44	—	—	—	44
Vesting of restricted stock units, net	2,255,153	—	—	—	—	—	—
Share-based compensation expense	—	—	14,298	—	—	—	14,298
Other comprehensive loss	—	—	—	(321)	—	—	(321)
Net loss	—	—	—	—	(47,507)	(26)	(47,533)
Balance at March 31, 2024	147,368,324	$ 14	$ 1,466,844	$ (106)	$ (1,191,839)	$ (147)	$ 274,766

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

Adaptive Biotechnologies Corporation

Condensed Consolidated Statements of Cash Flows
(in thousands)
(unaudited)

	Three Months Ended March 31,	
	2024	2023
Operating activities		
Net loss	$ (47,533)	$ (57,700)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation expense	4,791	5,004
Noncash lease expense	1,369	1,805
Share-based compensation expense	14,298	14,671
Intangible assets amortization	423	419
Investment amortization	(2,643)	(1,609)
Inventory reserve	249	1,080
Noncash interest expense	885	1,648
Other	114	5
Changes in operating assets and liabilities		
Accounts receivable, net	(4,052)	9,085
Inventory	1,111	(6,607)
Prepaid expenses and other current assets	1,520	(352)
Accounts payable and accrued liabilities	(3,941)	(15,878)
Operating lease right-of-use assets and liabilities	(2,549)	(2,223)
Deferred revenue	(2,393)	(8,486)
Other	(2)	(14)
Net cash used in operating activities	(38,353)	(59,152)
Investing activities		
Purchases of property and equipment	(1,511)	(2,924)
Purchases of marketable securities	(53,480)	(89,097)
Proceeds from maturities of marketable securities	99,500	155,000
Net cash provided by investing activities	44,509	62,979
Financing activities		
Proceeds from exercise of stock options	44	672
Net cash provided by financing activities	44	672
Net increase in cash, cash equivalents and restricted cash	6,200	4,499
Cash, cash equivalents and restricted cash at beginning of year	67,996	92,428
Cash, cash equivalents and restricted cash at end of period	$ 74,196	$ 96,927
Noncash investing activities		
Purchases of equipment included in accounts payable and accrued liabilities	$ 1,115	$ 1,651
Supplemental disclosure of cash flow information		
Cash paid for interest	$ 2,289	$ 2,760

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

1. Organization and Description of Business

Adaptive Biotechnologies Corporation ("we," "us" or "our") is a commercial-stage company advancing the field of immune medicine by harnessing the inherent biology of the adaptive immune system to transform the diagnosis and treatment of disease. We believe the adaptive immune system is nature's most finely tuned diagnostic and therapeutic for most diseases, but the inability to decode it has prevented the medical community from fully leveraging its capabilities. Our immune medicine platform applies our proprietary technologies to read the diverse genetic code of a patient's immune system and understand precisely how the immune system detects and treats disease in that patient. We capture these insights in our dynamic clinical immunomics database and related antigen annotations, which are underpinned by computational biology and machine learning, and use them to develop and commercialize clinical products and services that can be tailored to the needs of individual patients. We have commercial products and services and a robust pipeline of clinical products and services that we are designing to diagnose, monitor and enable the treatment of diseases, such as cancer and autoimmune disorders.

We were incorporated in the State of Washington on September 8, 2009 under the name Adaptive TCR Corporation. On December 21, 2011, we changed our name to Adaptive Biotechnologies Corporation. We are headquartered in Seattle, Washington.

2. Significant Accounting Policies

Basis of Presentation and Principles of Consolidation

The unaudited condensed consolidated financial statements include the accounts of Adaptive Biotechnologies Corporation, Adaptive Biotechnologies B.V., our wholly-owned subsidiary, and Digital Biotechnologies, Inc., a corporate subsidiary we have 70% ownership interest in. The remaining interest in Digital Biotechnologies, Inc., held by certain of our related parties and their related family trusts, are shown in the unaudited condensed consolidated financial statements as noncontrolling interest. All intercompany transactions and balances have been eliminated upon consolidation.

Use of Estimates

The preparation of condensed consolidated financial statements in conformity with accounting principles generally accepted in the United States of America ("GAAP") requires management to make certain estimates, judgments and assumptions that affect the reported amounts of assets and liabilities and the related disclosures at the date of the condensed consolidated financial statements, as well as the reported amounts of revenues and expenses during the periods presented. We base our estimates on historical experience and other relevant assumptions that we believe to be reasonable under the circumstances. Estimates are used in several areas including, but not limited to, estimates of progress to date for certain performance obligations and the transaction price for certain contracts with customers, share-based compensation, imputing interest for our revenue interest purchase agreement (the "Purchase Agreement") that we entered into in September 2022, the provision for income taxes, including related reserves, the analysis of goodwill impairment and the recoverability and impairment of long-lived assets, among others. These estimates generally involve complex issues and require judgments, involve the analysis of historical results and prediction of future trends, can require extended periods of time to resolve and are subject to change from period to period. Actual results may differ materially from management's estimates.

Unaudited Interim Condensed Consolidated Financial Statements

In our opinion, the accompanying unaudited condensed consolidated financial statements have been prepared in accordance with GAAP for interim financial information. These unaudited condensed consolidated financial statements include all adjustments necessary to fairly state our financial position and the results of our operations and cash flows for interim periods in accordance with GAAP. All such adjustments were of a normal, recurring nature. Interim-period results are not necessarily indicative of results of operations or cash flows for a full year or any subsequent interim period.

The accompanying unaudited condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements and notes included in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the Securities and Exchange Commission (the "SEC") on February 29, 2024.

Segment Information

We operate as two operating and reportable segments: MRD and Immune Medicine. We have determined that our chief executive officer is the chief operating decision maker ("CODM"). The CODM reviews operating results and other financial information presented at the MRD and Immune Medicine segment level, as well as on a consolidated basis, to make resource allocation decisions. The MRD and Immune Medicine segments are also our two reporting units.

Restricted Cash

We had a restricted cash balance of $3.0 million and $2.9 million as of March 31, 2024 and December 31, 2023, respectively. Our restricted cash primarily relates to certain balances we are required to maintain under lease arrangements for some of our property and facility leases.

Goodwill

Goodwill represents the excess of the purchase price over the net amount of attributed identifiable assets acquired and liabilities assumed in a business combination measured at fair value. We assess goodwill for impairment annually on October 1, or more frequently if events or changes in circumstances would more likely than not reduce the fair value of one or both of our reporting units below their respective carrying value. We evaluate goodwill for impairment by first assessing qualitative factors to determine whether it is more likely than not that the fair value of one or both of our reporting units is less than their respective carrying amount. If we so determine, or if we choose to bypass the qualitative assessment, we perform a quantitative goodwill impairment test. If impairment exists, the carrying value of the allocated goodwill is reduced to its fair value through an impairment charge recorded in the consolidated statements of operations. To date, we have not recognized any impairment of goodwill.

Concentrations of Risk

We are subject to a concentration of risk from a limited number of suppliers, or in certain cases, single suppliers, for some of our laboratory instruments and materials. This risk is managed by targeting a quantity of surplus stock.

Cash, cash equivalents and marketable securities are financial instruments that potentially subject us to concentrations of credit risk. We invest in money market funds, United States ("U.S.") government treasury and agency securities, corporate bonds and commercial paper with high-quality accredited financial institutions.

Significant customers are those that represent more than ten percent of our total revenue or accounts receivable, net balances for the periods and as of each condensed consolidated balance sheet date presented, respectively.

For each significant customer, revenue as a percentage of total revenue for the periods presented and accounts receivable, net as a percentage of total accounts receivable, net as of the dates presented were as follows:

	Revenue		Accounts Receivable, Net	
	Three Months Ended March 31,			
	2024	2023	March 31, 2024	December 31, 2023
Customer A	*%	*%	*%	*%
Customer B	*	*	*	*
Customer C	11.7	*	11.2	*
Genentech, Inc. and Roche Group	13.5	26.6	*	*

* less than 10%

Revenue Recognition

For all revenue-generating contracts, we perform the following steps to determine the amount of revenue to be recognized: (1) identify the contract or contracts; (2) determine whether the promised goods or services are performance obligations, including whether they are distinct in the context of the contract; (3) measure the transaction price, including the constraint on variable consideration; (4) allocate the transaction price to the performance obligations based on estimated selling prices; and (5) recognize revenue when (or as) we satisfy each performance obligation.

We derive revenue by providing diagnostic and research services in our Minimal Residual Disease ("MRD") and Immune Medicine business areas. Our MRD revenue consists of revenue generated from (1) providing our clonoSEQ report to clinical customers; (2) providing MRD sample testing services to biopharmaceutical customers and certain academic institutions, including investigator-led clinical trials; and (3) providing our clonoSEQ report or results to certain international laboratory sites through technology transfers. Our Immune Medicine revenue consists of revenue generated from (1) providing sample testing services for our commercial research product, Adaptive Immunosequencing, to biopharmaceutical customers and academic institutions; and (2) our collaboration agreements with Genentech, Inc. ("Genentech") and other biopharmaceutical customers in areas of drug and target discovery.

For agreements where we provide our clonoSEQ report to ordering physicians, we have identified one performance obligation: the delivery of a clonoSEQ report. We bill and receive payments for these transactions from commercial, government and medical institution payors. As payment from the respective payors may vary based on the various reimbursement rates and patient responsibilities, we consider the transaction price to be variable and record an estimate of the transaction price, subject to the constraint for variable consideration, as revenue at the time of delivery. The estimate of transaction price is based on historical and expected reimbursement rates with the various payors, which are monitored in subsequent periods and adjusted, as necessary, based on actual collection experience.

Regarding our clonoSEQ coverage under Medicare, we bill an episode of treatment when we deliver the first eligible test report. This billing contemplates all necessary tests required during a patient's treatment cycle, which is currently estimated at approximately four tests per patient, including the initial sequence identification test. Revenue recognition commences at the time the initial billable test report is delivered and is based upon cumulative tests delivered to date. We estimate the number of tests we expect to deliver over a patient's treatment cycle based on historical testing frequencies for patients by indication. These estimates are subject to change as we develop more information about utilization over time. Any unrecognized revenue from the initial billable test is recorded as deferred revenue and is recognized either as we deliver our estimate of the remaining tests in a patient's treatment cycle or when the likelihood becomes remote that a patient will receive additional testing.

The contract transaction price for agreements we enter into with biopharmaceutical customers to further develop and commercialize their therapeutics may consist of a combination of non-refundable upfront fees, separately priced MRD testing fees and milestone fees earned upon our customers' achievement of certain regulatory approvals. Depending on the contract, these agreements include single or multiple performance obligations. Such performance obligations include providing services to support our customers' therapeutic development efforts, including regulatory support for our technology intended to be utilized as part of our customers' registrational trials, developing analytical plans for our data, participating on joint research committees, assisting in completing a regulatory submission and providing MRD testing services related to customer-provided samples for our customers' regulatory submissions. Generally, the support services, excluding MRD testing services, are not distinct within the context of the contract and thus are accounted for as a single performance obligation. The transaction price allocated to the respective performance obligations is estimated using an adjusted market assessment approach for the regulatory support services and a standalone selling price for the estimated MRD testing services. When MRD sample testing services are separately priced customer options, we assess if a material right exists and, if not, the customer option to purchase additional MRD sample testing services is not considered part of the contract. We recognize revenue related to MRD testing services over time using an output method based on the proportion of sample results delivered relative to the total amount of sample results expected to be delivered, when expected to be a faithful depiction of progress. We use the same method to recognize the regulatory support services. When an output method based on the proportion of sample results delivered is not expected to be a faithful depiction of progress, we utilize an input method using a cost-based model based on estimates of effort completed. Selecting the measure of progress and estimating progress to date requires significant judgment. Except for any non-refundable upfront fees, the other forms of compensation represent variable consideration. At contract inception, we fully constrain any consideration related to regulatory milestones, as the achievement of such milestones is subject to third-party regulatory approval and the customers' own submission decision-making. Variable consideration related to regulatory milestones is estimated using the most likely amount method, where variable consideration is constrained until it is probable that a significant reversal of cumulative revenue will not occur. Milestone payments for regulatory approvals, which are not within our customers' control, are not considered probable of being achieved until those approvals are received. Determining whether regulatory milestone payments are probable is an area that requires significant judgment. In making this assessment, we evaluate scientific, clinical, regulatory and other risks, as well as the level of effort and investment required to achieve the respective milestone.

For research customers who utilize either our MRD or Adaptive Immunosequencing services, contracts typically include an amount billed in advance of services ("upfront") and subsequent billings as sample results are delivered to the customer. Upfront amounts received are recorded as deferred revenue, which we recognize as revenue upon satisfaction of performance obligations. We have identified two typical performance obligations under the terms of our research service contracts: (1) the delivery of our MRD data or Adaptive Immunosequencing for customer provided samples; and (2) related data analysis. We recognize revenue for both identified performance obligations as sample results are delivered to the customer. In periods where our sample estimates are reduced or a customer project is cancelled and, in either case, we have remaining related deferred revenue, we recognize revenue using a cumulative catch-up approach based on the proportion of samples delivered to date relative to the total samples expected to be delivered.

New Accounting Pronouncements Not Yet Adopted

In November 2023, the FASB issued Accounting Standards Update ("ASU") No. 2023-07, Segment Reporting (Topic 280): Improvements to Reportable Segment Disclosures, which intends to enhance reportable segment disclosures about significant segment expenses. This guidance is effective for fiscal years beginning after December 15, 2023 and interim periods within fiscal years beginning after December 15, 2024. Early adoption is permitted and the guidance is to be applied retrospectively. We are currently evaluating the impact of this guidance on our consolidated financial statements.

In December 2023, the FASB issued ASU No. 2023-09, Income Taxes (Topic 740): Improvements to Income Tax Disclosures, which primarily intends to enhance the rate reconciliation and income taxes paid disclosures. This guidance is effective for annual periods beginning after December 15, 2024. Early adoption is permitted and the guidance is to be applied prospectively; retrospective application is permitted. We are currently evaluating the impact of this guidance on our consolidated financial statements.

3. Revenue

We disaggregate our revenue from contracts with customers by business area and type of arrangement, as we believe this best depicts how the nature, amount, timing and uncertainty of our revenue and cash flows are affected by economic factors.

The following table presents our disaggregated revenue for the periods presented (in thousands):

	Three Months Ended March 31,	
	2024	2023
MRD revenue		
Service revenue	$ 28,126	$ 21,427
Regulatory milestone revenue	4,500	—
Total MRD revenue	32,626	21,427
Immune Medicine revenue		
Service revenue	4,559	7,102
Collaboration revenue	4,688	9,118
Total Immune Medicine revenue	9,247	16,220
Total revenue	$ 41,873	$ 37,647

During the three months ended March 31, 2024, we recognized $1.5 million in MRD service revenue related to Medicare reimbursements resulting from our determination that the likelihood of additional testing for specific patients was remote and from cancelled customer contracts. During the three months ended March 31, 2023, we recognized $1.0 million in MRD service revenue related to Medicare reimbursements resulting from our determination that the likelihood of additional testing for specific patients was remote and from cancelled customer contracts.

As of March 31, 2024, we could receive up to an additional $430.5 million in milestone payments in future periods if certain regulatory approvals are obtained by our customers' therapeutics in connection with MRD data generated from our MRD product.

Genentech Collaboration Agreement

In December 2018, we entered into a worldwide collaboration and license agreement with Genentech (the "Genentech Agreement") to leverage our capability to develop cellular therapies in oncology. Subsequent to receipt of regulatory approval in January 2019, we received a non-refundable, upfront payment of $300.0 million in February 2019. Additionally, we received a $10.0 million milestone in 2023. We may be eligible to receive $1.8 billion over time, including payments of up to $65.0 million upon the achievement of specified regulatory milestones, up to $300.0 million upon the achievement of specified development milestones and up to $1,430.0 million upon the achievement of specified commercial milestones. In addition, we are separately able to receive tiered royalties at a rate ranging from the mid-single digits to the mid-teens on aggregate worldwide net sales of products arising from the strategic collaboration, subject to certain reductions, with aggregate minimum floors. Under the Genentech Agreement, we are pursuing two product development pathways for novel T cell therapeutic products in which Genentech intends to use T cell receptors ("TCRs") screened by our immune medicine platform to engineer and manufacture cellular medicines:

- Shared Products. The shared products will use "off-the-shelf" TCRs identified against cancer antigens shared among patients ("Shared Products").
- Personalized Product. The personalized product will use patient-specific TCRs identified by real-time screening of TCRs against cancer antigens in each patient ("Personalized Product").

Under the terms of the Genentech Agreement, we granted Genentech exclusive worldwide licenses to develop and commercialize TCR-based cellular therapies in the field of oncology, including licenses to existing shared antigen data packages. Additionally, Genentech has the right to determine which product candidates to further develop for commercialization purposes. We determined that this arrangement meets the criteria set forth in Accounting Standards Codification ("ASC") Topic 808, *Collaborative Arrangements* ("ASC 808"), because both parties are active participants in the activity and are exposed to significant risks and rewards depending on the activity's commercial failure or success. Because ASC 808 does not provide guidance on how to account for the activities under a collaborative arrangement, we applied the guidance in ASC Topic 606, *Revenue from Contracts with Customers* ("ASC 606") to account for the activities related to the Genentech Agreement.

In applying ASC 606, we identified the following performance obligations at the inception of the agreement:

1. License to utilize on an exclusive basis all TCR-specific platform intellectual property to develop and commercialize any licensed products in the field of oncology.
2. License to utilize all data and information within each shared antigen data package and any other know-how disclosed by us to Genentech in oncology.
3. License to utilize all private antigen TCR product data in connection with research and development activities in the field of use.
4. License to existing shared antigen data packages.
5. Research and development services for Shared Products development, including expansion of shared antigen data packages.
6. Research and development services for private product development.
7. Obligations to participate on various joint research, development and project committees.

We determined that none of the licenses, research and development services or obligations to participate on various committees were distinct within the context of the contract, given such rights and activities were highly interrelated and there was substantial additional research and development to further develop the licenses. We considered factors such as the stage of development of the respective existing antigen data packages, the subsequent development that would be required to both identify and submit a potential target for investigational new drug acceptance under both product pathways and the variability in research and development pathways given Genentech's control of product commercialization. Specifically, under the Genentech Agreement, Genentech is not required to pursue development or commercialization activities pertaining to both product pathways and may choose to proceed with one or the other. Accordingly, we determined that all of the identified performance obligations were attributable to one general performance obligation, which is to further the development of our TCR-specific platform, including data packages, and continue to make our TCR identification process available to Genentech to pursue either product pathway.

Separately, we have a responsibility to Genentech to enter into a supply and manufacturing agreement for patient-specific TCRs as it pertains to any Personalized Product therapeutic. We determined this was an option right of Genentech should they pursue commercialization of a Personalized Product therapy. Because of the uncertainty resulting from the early stage of development, the novel approach of our collaboration with Genentech and our rights to future commercial milestones and royalty payments, we determined that this option right was not a material right that should be accounted for at inception. As such, we will account for the supply and manufacturing agreement when entered into between the parties.

We determined the initial transaction price shall be made up of only the $300.0 million upfront, non-refundable payment, as all potential regulatory and development milestone payments were probable of significant revenue reversal given their achievement was highly dependent on factors outside our control. As a result, these payments were fully constrained and were not included in the initial transaction price. In May 2023, one of the regulatory milestones was achieved, resulting in a $10.0 million addition to the transaction price, $7.7 million of which was recognized as revenue in the three months ended June 30, 2023, with the remainder included in deferred revenue to be recognized as revenue over the remaining research and development period. We continue to exclude the commercial milestones and potential royalties from the transaction price, as those items relate predominantly to the license rights granted to Genentech and will be assessed when and if such events occur.

As there are potential substantive developments necessary, which Genentech may be able to direct, we determined that we would apply a proportional performance model to recognize revenue for our performance obligation. We measure proportional performance using an input method based on costs incurred relative to the total estimated costs of research and development efforts to pursue both the Shared Products and Personalized Product pathways. When any of the potential regulatory and development milestones are no longer fully constrained and are included in the transaction price, such amounts will be recognized using the cumulative catch-up method based on proportional performance at such time. We currently expect to recognize revenue generated from the Genentech Agreement over a period of approximately nine years from the effective date. This estimate of the research and development period considers pursuit options of development activities supporting both the Shared Products and Personalized Product, but may be reduced or increased based on the various activities as directed by the joint committees, decisions made by Genentech, regulatory feedback or other factors not currently known.

In total, we recognized $4.7 million and $9.1 million in Immune Medicine collaboration revenue during the three months ended March 31, 2024 and 2023, respectively, related to the Genentech Agreement. Costs related to the Genentech Agreement are included in research and development expenses.

4. Deferred Revenue

Deferred revenue from the Genentech Agreement represents $8.4 million and $41.6 million of the current and non-current deferred revenue balances, respectively, as of March 31, 2024 and $13.6 million and $41.1 million of the current and non-current deferred revenue balances, respectively, as of December 31, 2023. We expect our current deferred revenue to be recognized as revenue within 12 months. We expect the majority of our non-current deferred revenue to be recognized as revenue over a period of approximately four years from March 31, 2024. This period of time represents an estimate of the research and development period to develop cellular therapies in oncology, which may be reduced or increased based on various research and development activities.

Changes in deferred revenue during the three months ended March 31, 2024 were as follows (in thousands):

Deferred revenue balance at December 31, 2023	$	93,423
Additions to deferred revenue during the period		10,802
Revenue recognized during the period		(13,195)
Deferred revenue balance at March 31, 2024	$	91,030

As of March 31, 2024, $10.5 million was recognized as revenue that was included in the deferred revenue balance at December 31, 2023.

5. Fair Value Measurements

The following tables set forth the fair values of financial assets as of March 31, 2024 and December 31, 2023 that were measured at fair value on a recurring basis (in thousands):

	March 31, 2024			
	Level 1	Level 2	Level 3	Total
Financial assets				
Money market funds	$ 44,303	$ —	$ —	$ 44,303
Commercial paper	—	10,777	—	10,777
U.S. government treasury securities	—	217,701	—	217,701
Corporate bonds	—	9,161	—	9,161
Total financial assets	$ 44,303	$ 237,639	$ —	$ 281,942

	December 31, 2023			
	Level 1	Level 2	Level 3	Total
Financial assets				
Money market funds	$ 45,123	$ —	$ —	$ 45,123
Commercial paper	—	10,630	—	10,630
U.S. government treasury and agency securities	—	264,426	—	264,426
Corporate bonds	—	6,281	—	6,281
Total financial assets	$ 45,123	$ 281,337	$ —	$ 326,460

Level 1 securities include highly liquid money market funds, for which we measure the fair value based on quoted prices in active markets for identical assets or liabilities. Level 2 securities consist of U.S. government treasury and agency securities, commercial paper and corporate bonds, and are valued based on recent trades of securities in inactive markets or on quoted market prices of similar instruments and other significant inputs derived from or corroborated by observable market data.

6. Investments

Available-for-sale investments consisted of the following as of March 31, 2024 and December 31, 2023 (in thousands):

	March 31, 2024			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Estimated Fair Value
Short-term marketable securities				
Commercial paper	$ 10,777	$ —	$ —	$ 10,777
U.S. government treasury securities	217,805	25	(129)	217,701
Corporate bonds	9,163	—	(2)	9,161
Total short-term marketable securities	$ 237,745	$ 25	$ (131)	$ 237,639

	December 31, 2023			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Estimated Fair Value
Short-term marketable securities				
Commercial paper	$ 10,630	$ —	$ —	$ 10,630
U.S. government treasury and agency securities	264,214	232	(20)	264,426
Corporate bonds	6,278	3	—	6,281
Total short-term marketable securities	$ 281,122	$ 235	$ (20)	$ 281,337

All the U.S. government treasury and agency securities, commercial paper and corporate bonds designated as short-term marketable securities have an effective maturity date that is equal to or less than one year from the respective condensed consolidated balance sheet date. Those that are designated as long-term marketable securities have an effective maturity date that is more than one year from the respective condensed consolidated balance sheet date.

Accrued interest receivable is excluded from the amortized cost and estimated fair value of our marketable securities. Accrued interest receivable of $1.1 million and $1.0 million was presented separately within the prepaid expenses and other current assets balance on the unaudited condensed consolidated balance sheet as of March 31, 2024 and on the condensed consolidated balance sheet as of December 31, 2023, respectively.

The following table presents the gross unrealized holding losses and fair values for investments in an unrealized loss position, and the length of time individual securities have been in a continuous loss position, as of March 31, 2024 (in thousands):

	Less Than 12 Months		12 Months Or Greater	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
U.S. government treasury securities	$ 134,826	$ (129)	$ —	$ —
Corporate bonds	6,514	(2)	—	—
Total available-for-sale securities	$ 141,340	$ (131)	$ —	$ —

We periodically review our available-for-sale securities to assess for credit impairment. Some of the factors considered in assessing impairment include the extent to which the fair value is less than the amortized cost basis, adverse conditions related to the security, an industry or geographic area, changes to security ratings or sector credit ratings and other relevant market data.

As of March 31, 2024, we did not intend, nor were we more likely than not to be required, to sell our available-for-sale investments before the recovery of their amortized cost basis, which may be maturity. Based on our assessment, we concluded all impairment as of March 31, 2024 to be due to factors other than credit loss, such as changes in interest rates. A credit allowance was not recognized and the impairment of our available-for-sale securities was recorded in other comprehensive loss.

7. Leases

We have operating lease agreements for laboratory, office and warehouse facilities in Seattle, Washington, South San Francisco, California and Bothell, Washington. As of March 31, 2024, we were not party to any finance leases.

The following table reconciles our undiscounted operating lease cash flows to our operating lease liabilities, less current portion balance as of March 31, 2024 (in thousands):

2024 (excluding the three months ended March 31, 2024)	$	10,297
2025		14,098
2026		12,330
2027		11,944
2028		12,282
Thereafter		56,962
Total undiscounted lease payments		117,913
Less: Imputed interest rate		(21,419)
Total operating lease liabilities		96,494
Less: Current portion		(9,594)
Operating lease liabilities, less current portion	$	86,900

During the three months ended March 31, 2024 and 2023, cash paid for amounts included in the measurement of lease liabilities was $3.7 million and $3.4 million, respectively.

We have $2.1 million in letters of credit with one of our financial institutions in connection with certain of our leases.

8. Revenue Interest Purchase Agreement

In September 2022, we entered into the Purchase Agreement with OrbiMed Royalty & Credit Opportunities IV, LP ("OrbiMed"), an affiliate of OrbiMed Advisors LLC, as collateral agent and administrative agent for the purchasers party thereto (the "Purchasers"). Pursuant to the Purchase Agreement, we received $125.0 million from the Purchasers at closing, less certain transaction expenses. We are also entitled to receive up to $125.0 million in subsequent installments as follows: (i) $75.0 million upon our request occurring no later than September 12, 2025 and (ii) $50.0 million upon our request in connection with certain permitted acquisitions occurring no later than September 12, 2025, in each case subject to certain funding conditions.

As consideration for such payments, the Purchasers have a right to receive certain revenue interests (the "Revenue Interests") from us based on a percentage of all GAAP revenue. Payments in respect of the Revenue Interests shall be made quarterly within 45 days following the end of each fiscal quarter (each, a "Revenue Interest Payment").

Accounting Treatment

We accounted for the transaction as debt recorded at amortized cost using the effective interest rate method.

To determine the amortization of the Purchase Agreement obligation, we are required to estimate the amount and timing of future Revenue Interest Payments based on our estimate of the timing and amount of future revenues and calculate an effective interest rate which will amortize the obligation to zero over the amortization period. The calculated effective interest rate as of March 31, 2024 was 9.2%.

In connection with the Purchase Agreement, we incurred debt issuance costs of $0.6 million. Debt issuance costs have been recorded to debt and are being amortized over the estimated term of the debt using the effective interest method, adjusted on a prospective basis for changes in the underlying assumptions and inputs.

The assumptions used in determining the expected repayment term of the obligation and amortization period of the issuance costs requires that we make estimates that could impact the short- and long-term classification of these costs, as well as the period over which these costs will be amortized. We periodically assess the amount and timing of expected Revenue Interest Payments based on internal forecasts. To the extent such payments are greater or less than our initial estimates or the timing of such payments is materially different than our original estimates, we will prospectively adjust the amortization of the revenue interest liability and the effective interest rate.

The following table sets forth the revenue interest liability, net activity during the three months ended March 31, 2024 (in thousands):

Revenue interest liability, net at December 31, 2023	$	130,660
Interest expense		2,993
Revenue interest payable		(2,108)
Revenue interest liability, net at March 31, 2024	$	131,545

Revenue interest payable of $2.1 million and $2.3 million was included within the accounts payable balance on the unaudited condensed consolidated balance sheet as of March 31, 2024 and on the condensed consolidated balance sheet as of December 31, 2023, respectively.

9. Commitments and Contingencies

Legal Proceedings

We are subject to claims and assessments from time to time in the ordinary course of business. We will accrue a liability for such matters when it is probable that a liability has been incurred and the amount can be reasonably estimated. When only a range of possible loss can be established, the most probable amount in the range is accrued. If no amount within this range is a better estimate than any other amount within the range, the minimum amount in the range is accrued. We were not party to any material legal proceedings as of March 31, 2024.

Indemnification Agreements

In the ordinary course of business, we may provide indemnification of varying scope and terms to vendors, lessors, customers and other parties with respect to certain matters including, but not limited to, losses arising out of breach of our agreements with them or from intellectual property infringement claims made by third parties. In addition, we have entered into indemnification agreements with members of our board of directors and certain of our executive officers that will require us to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments that we could be required to make under these indemnification agreements is, in many cases, unlimited. We have not incurred any material costs as a result of such indemnifications and are not currently aware of any indemnification claims.

10. Shareholders' Equity

Common Stock

Our common stock has no preferences or privileges and is not redeemable. Holders of our common stock are entitled to one vote for each share of common stock held. The holders of record of outstanding shares of common stock shall be entitled to receive, when, as and if declared, out of funds legally available, such cash and other dividends as may be declared from time to time.

Our 2019 Equity Incentive Plan (the "2019 Plan") provides for annual increases in the number of shares that may be issued under the 2019 Plan on January 1, 2020 and on each subsequent January 1, thereafter, by a number of shares equal to the lesser of (a) 5% of the number of shares of common stock issued and outstanding on the immediately preceding December 31, or (b) an amount determined by our board of directors.

Furthermore, our Employee Stock Purchase Plan (the "ESPP") provides for annual increases in the number of shares available for issuance under our ESPP on January 1, 2020 and on each January 1, thereafter, by a number of shares equal to the smallest of (a) 1% of the number of shares of common stock issued and outstanding on the immediately preceding December 31, or (b) an amount determined by our board of directors.

Effective January 1, 2024, our 2019 Plan and ESPP reserves increased by 7,254,113 shares and 1,450,822 shares, respectively.

As of March 31, 2024, we had reserved shares of common stock for the following:

Shares issuable upon the exercise of outstanding stock options granted	13,588,812
Shares issuable upon the vesting of outstanding restricted stock units granted and the maximum outstanding market-based restricted stock units eligible to be earned	15,986,199
Shares available for future grant under the 2019 Equity Incentive Plan	15,149,986
Shares available for future grant under the Employee Stock Purchase Plan	5,686,170
Total shares of common stock reserved for future issuance	50,411,167

11. Equity Incentive Plans

2009 Equity Incentive Plan

We adopted an equity incentive plan in 2009 (the "2009 Plan") that provided for the issuance of incentive and nonqualified common stock options and other share-based awards for employees, directors and consultants. Under the 2009 Plan, the exercise price for incentive and nonqualified stock options were not to be less than the fair market value of our common stock at the date of grant. Stock options granted under this plan expire no later than ten years from the grant date and vesting was established at the time of grant. Pursuant to the terms of the 2019 Plan, any shares subject to outstanding stock options originally granted under the 2009 Plan that terminate, expire or lapse for any reason without the delivery of shares to the holder thereof shall become available for issuance pursuant to awards granted under the 2019 Plan. While no shares are available for future grant under the 2009 Plan, it continues to govern outstanding equity awards granted thereunder.

2019 Equity Incentive Plan

The 2019 Plan became effective immediately prior to the closing of our initial public offering in July 2019. The 2019 Plan provides for the issuance of awards in the form of stock options and other share-based awards for employees, directors and consultants. Under the 2019 Plan, the stock option exercise price per share shall not be less than the fair market value of a share of stock on the effective date of grant, as defined by the 2019 Plan, unless explicitly qualified under the provisions of Section 409A or Section 424(a) of the Internal Revenue Code of 1986. Additionally, unless otherwise specified, stock options granted under this plan expire no later than ten years from the grant date and vesting is established at the time of grant. Except for certain stock option and restricted stock unit grants made to non-employee directors, stock options and restricted stock units granted under the 2019 Plan generally vest over a four-year period, subject to continuous service through each applicable vesting date. As of March 31, 2024, we had 39,881,924 shares of common stock authorized for issuance under the 2019 Plan.

Changes in shares available for grant during the three months ended March 31, 2024 were as follows:

	Shares Available for Grant
Shares available for grant at December 31, 2023	15,299,763
2019 Equity Incentive Plan reserve increase effective January 1, 2024	7,254,113
Stock options and restricted stock units granted and the maximum market-based restricted stock units granted eligible to be earned	(8,399,478)
Stock options and restricted stock units forfeited or expired	995,588
Shares available for grant at March 31, 2024	15,149,986

Stock Options

Stock option activity under the 2009 Plan and 2019 Plan during the three months ended March 31, 2024 was as follows:

	Shares Subject to Outstanding Stock Options	Weighted-Average Exercise Price per Share	Aggregate Intrinsic Value (in thousands)
Stock options outstanding at December 31, 2023	12,875,045	$ 15.90	
Stock options granted	1,008,364	3.99	
Stock options forfeited	(195,745)	17.55	
Stock options expired	(67,952)	17.31	
Stock options exercised	(30,900)	1.43	
Stock options outstanding at March 31, 2024	13,588,812	$ 15.02	$ 108
Stock options vested and exercisable at March 31, 2024	9,662,208	$ 16.25	$ 108

The weighted-average remaining contractual life for stock options outstanding as of March 31, 2024 was 6.2 years. The weighted-average remaining contractual life for vested and exercisable stock options as of March 31, 2024 was 5.2 years.

Restricted Stock Units

Restricted stock unit activity under the 2019 Plan during the three months ended March 31, 2024 was as follows:

	Restricted Stock Units Outstanding	Weighted-Average Grant Date Fair Value per Share
Nonvested restricted stock units outstanding at December 31, 2023	9,669,460	$ 10.32
Restricted stock units granted	5,327,094	3.99
Restricted stock units forfeited	(731,891)	10.05
Restricted stock units vested	(2,255,158)	11.04
Nonvested restricted stock units outstanding at March 31, 2024	12,009,505	$ 7.39

Market-Based Restricted Stock Units

In addition to the restricted stock units described above, our board of directors approved awards of market-based restricted stock units to our chief executive officer, former chief financial officer, president/chief operating officer and chief scientific officer in March 2024. The shares of common stock that may be earned under the awards granted to our chief executive officer, former chief financial officer, president/chief operating officer and chief scientific officer, which range from zero shares to 709,220 shares, 295,580 shares, 350,000 shares and 709,220 shares, respectively, are calculated based on our total shareholder return during a three-year performance period as measured against that of the group of companies comprising the S&P Biotechnology Select Industry Index as of the grant date, subject to certain adjustments to such index group. Except as expressly provided in the terms of each award's agreement, vesting is subject to the respective grantee's continuous service through the end of the three-year performance period. These market-based restricted stock units, along with those granted in March 2022 and March 2023, which had a weighted-average grant date fair value per share of $15.13 and under which zero shares to 1,912,674 shares may be earned, remained outstanding as of March 31, 2024.

Grant Date Fair Value of Stock Options, Restricted Stock Units and Market-Based Restricted Stock Units Granted

The estimated grant date fair values of stock options granted during the three months ended March 31, 2024 and 2023 were estimated using the Black-Scholes option-pricing model with the following assumptions:

	Three Months Ended March 31,	
	2024	2023
Fair value of common stock	$3.99	$8.46
Expected term (in years)	5.27 - 6.08	5.27 - 6.08
Risk-free interest rate	4.2%	4.2% - 4.3%
Expected volatility	74.5% - 75.0%	71.2% - 71.6%
Expected dividend yield	—	—

The determination of the grant date fair value of stock options granted using a Black-Scholes option-pricing model is affected by the fair value of our common stock, as well as assumptions regarding a number of variables that are subjective and generally require judgment to determine. The valuation assumptions were determined as follows:

Fair value of common stock—The fair value of each share of common stock is based on the closing price of our common stock on the date of grant, or other relevant determination date, as reported on The Nasdaq Global Select Market.

Expected term—The expected term of stock options granted to employees and non-employee directors is determined using the “simplified” method, as illustrated in ASC Topic 718, *Compensation—Stock Compensation*, as we do not have sufficient exercise history to determine a better estimate of expected term. Under this approach, the expected term is based on the midpoint between the vesting date and the end of the contractual term of the stock option.

Risk-free interest rate—We utilize a risk-free interest rate in the option valuation model based on U.S. Treasury zero-coupon issues with remaining terms similar to the expected terms of the stock options.

Expected volatility—As we do not have sufficient trading history for our common stock, expected volatility has been based on the historical volatility of our publicly traded industry peers utilizing a period of time consistent with our estimate of expected term. Beginning in 2024, expected volatility was based on a weighted average of our historical volatility and the historical volatility of our publicly traded industry peers utilizing a period of time consistent with our estimate of expected term.

Expected dividend yield—We do not anticipate paying any cash dividends in the foreseeable future and, therefore, use an expected dividend yield of zero in the option valuation model.

The weighted-average grant date fair value per share of stock options granted during the three months ended March 31, 2024 and 2023 was $2.70 and $5.61, respectively.

The grant date fair value of restricted stock units granted is based on the closing price of our common stock on the date of grant, or other relevant determination date, as reported on The Nasdaq Global Select Market. The weighted-average grant date fair value per share of restricted stock units granted during the three months ended March 31, 2024 and 2023 was $3.99 and $8.46, respectively.

The weighted-average grant date fair value per share of the market-based restricted stock units granted during the three months ended March 31, 2024 and 2023 was $6.49 and $13.82, respectively, and was determined using a Monte Carlo valuation model, which uses assumptions such as volatility, risk-free interest rate and dividend estimated for the respective performance periods. The weighted-average grant date fair value per share of the target payout level of the market-based restricted stock units outstanding as of March 31, 2024, 1,988,347 shares, was $10.65. The aggregate share-based compensation expense of the market-based restricted stock units granted during the three months ended March 31, 2024 and 2023 was $6.7 million and $9.8 million, respectively, and is recognized on a straight-line basis over the respective grants' three-year performance periods, which are also the requisite service periods. Attainment of each grant's respective market condition and the number of shares earned and vested does not impact the related share-based compensation expense recognized. Share-based compensation expense will be reversed only if the respective grantee does not provide continuous service through the respective performance period for reasons other than those expressly provided in the terms of the respective award.

The compensation cost related to stock options, restricted stock units and market-based restricted stock units for the three months ended March 31, 2024 and 2023 are included on the unaudited condensed consolidated statements of operations as follows (in thousands):

	Three Months Ended March 31,	
	2024	2023
Cost of revenue	$ 906	$ 1,294
Research and development	4,684	4,549
Sales and marketing	3,013	3,431
General and administrative	5,695	5,397
Total share-based compensation expense	$ 14,298	$ 14,671

As of March 31, 2024, unrecognized share-based compensation expense and the remaining weighted-average recognition period were as follows:

	Unrecognized Share-Based Compensation Expense (in thousands)	Remaining Weighted-Average Recognition Period (in years)
Nonvested stock options	$ 28,766	1.92
Nonvested restricted stock units	83,591	2.79
Nonvested market-based restricted stock units	14,271	2.28

12. Net Loss Per Share Attributable to Adaptive Biotechnologies Corporation Common Shareholders

The following table sets forth the computation of basic and diluted net loss per share attributable to our common shareholders for the three months ended March 31, 2024 and 2023 (in thousands, except share and per share amounts):

	Three Months Ended March 31,	
	2024	2023
Net loss attributable to Adaptive Biotechnologies Corporation	$ (47,507)	$ (57,699)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	145,787,527	143,511,142
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.33)	$ (0.40)

Given the loss position for all periods presented, basic net loss per share attributable to our common shareholders is the same as diluted net loss per share attributable to our common shareholders, as the inclusion of all potential shares of common stock outstanding would have been anti-dilutive.

The following weighted-average common stock equivalents were excluded from the calculation of diluted net loss per share attributable to our common shareholders for the three months ended March 31, 2024 and 2023, as they had an anti-dilutive effect:

	Three Months Ended March 31,	
	2024	2023
Stock options outstanding	13,085,872	13,800,485
Nonvested restricted stock units outstanding	10,341,199	7,386,862
Maximum nonvested market-based restricted stock units outstanding eligible to be earned	2,547,757	904,006
Total	25,974,828	22,091,353

13. Segment Information

In 2024, in connection with an organizational realignment, we began operating our business as two reporting segments: MRD and Immune Medicine. These segments are organized by market opportunity in commercial diagnostics and drug discovery, respectively.

The MRD business focuses on the use of our highly sensitive, next-generation sequencing assay to measure MRD in patients with hematologic malignancies. It is comprised of our clonoSEQ clinical diagnostic test, offered to clinicians, and our clonoSEQ assay, offered to biopharmaceutical partners, to advance drug development efforts. Our MRD revenue consists of revenue generated from (1) providing our clonoSEQ report to clinical customers; (2) providing MRD sample testing services to biopharmaceutical customers and certain academic institutions, including investigator-led clinical trials; and (3) providing our clonoSEQ report or results to certain international laboratory sites through technology transfers.

The Immune Medicine business leverages our proprietary ability to sequence, map, pair and characterize TCRs and B cell receptors (“BCRs”) at scale. We have created a powerful data engine to drive the development of novel therapies. Our Immune Medicine revenue consists of revenue generated from (1) providing sample testing services for our commercial research product, Adaptive Immunosequencing, to biopharmaceutical customers and academic institutions; and (2) our collaboration agreements with Genentech and other biopharmaceutical customers in areas of drug and target discovery.

There are no inter-segment revenues. See Note 3, *Revenue* for more information about each segment's revenue. Our CODM evaluates performance of the MRD segment based on both revenue and Adjusted EBITDA and evaluates performance of the Immune Medicine segment based on Adjusted EBITDA. Adjusted EBITDA for each of our segments includes costs that are directly aligned to each segment, as well as certain allocated shared expenses. These shared expenses primarily relate to our general and administrative functions, our non-laboratory facility space in our corporate headquarters and our production laboratory. We use the relative direct headcount assigned to each of the respective segments and our production laboratory sample volume to allocate these expenses. We do not allocate certain expenses, such as our corporate insurance costs, external legal and audit costs and expenses related to our investor relations, chief executive officer and other related support functions. Additionally, we do not allocate costs related to our idle facility in Seattle, Washington, interest expense related to our Purchase Agreement nor interest and other income, net. Given these unallocated costs and income are not included in the measurements reviewed by the CODM to assess each segment's performance, they are included in "Unallocated Corporate" below. Our allocation methodology will be periodically evaluated and may change. Our CODM is not regularly provided nor reviews assets when assessing each segment's performance and to allocate resources. As such, assets for reportable segments are not disclosed.

The following tables set forth our segment information for the three months ended March 31, 2024 and 2023 (in thousands):

	Three Months Ended March 31, 2024			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 32,626	$ 9,247	$ —	$ 41,873
Operating expenses	59,886	23,841	6,908	90,635
Adjusted EBITDA[1]	(17,259)	(6,927)	(3,994)	(28,180)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (27,260)	$ (14,593)	$ (5,680)	$ (47,533)
Net loss attributable to noncontrolling interest	—	—	26	26
Net loss attributable to Adaptive Biotechnologies Corporation	(27,260)	(14,593)	(5,654)	(47,507)
Interest and other income, net	—	—	(4,222)	(4,222)
Interest expense[2]	—	—	2,993	2,993
Depreciation and amortization expense	2,701	2,082	431	5,214
Restructuring expense[3]	467	577	—	1,044
Share-based compensation expense[4]	6,833	5,007	2,458	14,298
Adjusted EBITDA[1]	$ (17,259)	$ (6,927)	$ (3,994)	$ (28,180)

	Three Months Ended March 31, 2023			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 21,427	$ 16,220	$ —	$ 37,647
Operating expenses	56,025	31,672	7,143	94,840
Adjusted EBITDA[1]	(26,386)	(7,427)	(3,285)	(37,098)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (34,597)	$ (15,452)	$ (7,651)	$ (57,700)
Net loss attributable to noncontrolling interest	—	—	1	1
Net loss attributable to Adaptive Biotechnologies Corporation	(34,597)	(15,452)	(7,650)	(57,699)
Interest and other income, net	—	—	(3,024)	(3,024)
Interest expense[2]	—	—	3,531	3,531
Depreciation and amortization expense	2,056	2,753	614	5,423
Share-based compensation expense[4]	6,155	5,272	3,244	14,671
Adjusted EBITDA[1]	$ (26,386)	$ (7,427)	$ (3,285)	$ (37,098)

[1] Adjusted EBITDA is a non-GAAP financial measure. See "Management's Discussion and Analysis of Financial Condition and Results of Operations—Adjusted EBITDA" for an explanation for how it is calculated and used by management.
[2] Represents costs associated with our revenue interest liability and noncash interest costs associated with the amortization of the related deferred issuance costs. See Note 8, *Revenue Interest Purchase Agreement* for details on the Purchase Agreement.
[3] Represents costs associated with our organizational realignment to our two segments initiated in the three months ended March 31, 2024. These costs primarily related to one-time termination benefits and ongoing benefit arrangements.
[4] Represents share-based compensation expense related to stock option, restricted stock unit and market-based restricted stock unit awards. See Note 11, *Equity Incentive Plans* for details on our share-based compensation expense.

Segment information for the three months ended March 31, 2023 is presented on a comparable basis to that of the current period and is based on judgments and allocation methods from our recent organizational changes.

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 the unaudited condensed consolidated financial statements and related notes and the other financial information appearing elsewhere in this report, as well as the other financial information we file with the SEC from time to time. Some of the information contained in this discussion and analysis or set forth elsewhere in this report, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties relating to our future plans, objectives, expectations, intentions and financial performance and the assumptions that underlie these statements.

As a result of many factors, including those factors set forth in the "Risk Factors" section of this report, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are advancing the field of immune medicine by harnessing the inherent biology of the adaptive immune system to transform the diagnosis and treatment of disease. We believe the adaptive immune system is nature's most finely tuned diagnostic and therapeutic for most diseases, but the inability to decode it has prevented the medical community from fully leveraging its capabilities. Our immune medicine platform applies our proprietary technologies to read the diverse genetic code of a patient's immune system and understand precisely how the immune system detects and treats disease in that patient. We capture these insights in our dynamic clinical immunomics database and related antigen annotations, which are underpinned by computational biology and machine learning, and use them to develop and commercialize clinical products and services that can be tailored to the needs of individual patients. Our existing and future commercial products and services are aligned to two business areas which we refer to as MRD and Immune Medicine.

Our current product and service offerings in MRD related to the MRD market are our clonoSEQ clinical diagnostic test, offered to clinicians, and our clonoSEQ or MRD assay, offered to biopharmaceutical partners to advance drug development efforts ("MRD Pharma"). Our first clinical diagnostic product, clonoSEQ, is the first test authorized by the Food and Drug Administration for the detection and monitoring of MRD in patients with multiple myeloma, B cell acute lymphoblastic leukemia and chronic lymphocytic leukemia, and is also available as a CLIA-validated laboratory developed test for patients with other lymphoid cancers, including diffuse large B-cell lymphoma. With the use of clonoSEQ, we are transforming how lymphoid cancers are treated by working with providers, pharmaceutical partners and payors.

Immune Medicine leverages our proprietary ability to sequence, map, pair and characterize T cell receptors ("TCRs") and B cell receptors ("BCRs") at scale to drive opportunities in cancer, autoimmune disorders, infectious diseases and neurodegenerative disorders. Our core research product, Adaptive Immunosequencing, serves as our underlying research and development engine and generates revenue from biopharmaceutical and academic customers. Leveraging our collaboration with Microsoft Corporation, we are creating the TCR-Antigen Map. We are using the TCR-Antigen Map to identify and validate disease signatures to improve the diagnosis and treatment of many diseases. In Drug Discovery, we use our proprietary capabilities to discover new drug targets and leverage our validated TCR and BCR discovery approaches to discover and develop TCR or antibody therapeutic assets. Drug Discovery includes our worldwide collaboration and license agreement with Genentech (the "Genentech Agreement").

We recognized revenue of $41.9 million and $37.6 million for the three months ended March 31, 2024 and 2023, respectively. Net loss attributable to Adaptive Biotechnologies Corporation was $47.5 million and $57.7 million for the three months ended March 31, 2024 and 2023, respectively. We have funded our operations to date principally from the sale of convertible preferred stock and common stock and, to a lesser extent, revenue and proceeds from the revenue interest purchase agreement we entered into in September 2022 with OrbiMed Royalty & Credit Opportunities IV, LP, an affiliate of OrbiMed Advisors LLC, as collateral agent and administrative agent for the purchasers party thereto (the "Purchase Agreement"). As of March 31, 2024 and December 31, 2023, we had cash, cash equivalents and marketable securities of $308.9 million and $346.4 million, respectively.

2023 Quarterly Segment Information

In 2024, in connection with an organizational realignment, we began operating our business as two reporting segments: MRD and Immune Medicine. These segments are organized by market opportunity in commercial diagnostics and drug discovery, respectively. See Note 13, *Segment Information* for more information regarding our segments and the assumptions used to allocate shared expenses, which are based on judgments and methods related to our 2024 organizational changes.

The following tables set forth our segment information for the periods presented (in thousands):

	Three Months Ended December 31, 2023			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 30,762	$ 15,022	$ —	$ 45,784
Operating expenses	58,183	26,280	32,389	116,852
Adjusted EBITDA[(1)]	(17,763)	(2,979)	(3,923)	(24,665)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (27,421)	$ (11,258)	$ (30,788)	$ (69,467)
Net loss attributable to noncontrolling interest	—	—	26	26
Net loss attributable to Adaptive Biotechnologies Corporation	(27,421)	(11,258)	(30,762)	(69,441)
Interest and other income, net	—	—	(4,613)	(4,613)
Interest expense	—	—	3,012	3,012
Depreciation and amortization expense	2,413	2,529	450	5,392
Impairment of right-of-use and related long-lived assets	—	—	25,429	25,429
Share-based compensation expense	7,245	5,750	2,561	15,556
Adjusted EBITDA[(1)]	$ (17,763)	$ (2,979)	$ (3,923)	$ (24,665)

	Three Months Ended September 30, 2023			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 24,668	$ 13,251	$ —	$ 37,919
Operating expenses	55,977	26,400	6,498	88,875
Adjusted EBITDA[(1)]	(21,616)	(4,986)	(3,229)	(29,831)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (31,309)	$ (13,148)	$ (5,869)	$ (50,326)
Net loss attributable to noncontrolling interest	—	—	26	26
Net loss attributable to Adaptive Biotechnologies Corporation	(31,309)	(13,148)	(5,843)	(50,300)
Interest and other income, net	—	—	(4,282)	(4,282)
Interest expense	—	—	3,652	3,652
Depreciation and amortization expense	2,489	2,546	728	5,763
Share-based compensation expense	7,204	5,616	2,516	15,336
Adjusted EBITDA[(1)]	$ (21,616)	$ (4,986)	$ (3,229)	$ (29,831)

	Three Months Ended June 30, 2023			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 25,882	$ 23,044	$ —	$ 48,926
Operating expenses	58,944	30,681	7,119	96,744
Adjusted EBITDA[(1)]	(23,079)	1,264	(3,004)	(24,819)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (33,063)	$ (7,636)	$ (7,112)	$ (47,811)
Net loss attributable to noncontrolling interest	—	—	1	1
Net loss attributable to Adaptive Biotechnologies Corporation	(33,063)	(7,636)	(7,111)	(47,810)
Interest and other income, net	—	—	(3,612)	(3,612)
Interest expense	—	—	3,605	3,605
Depreciation and amortization expense	2,267	2,608	778	5,653
Share-based compensation expense	7,717	6,292	3,336	17,345
Adjusted EBITDA[(1)]	$ (23,079)	$ 1,264	$ (3,004)	$ (24,819)

	Three Months Ended March 31, 2023			
	MRD	Immune Medicine	Unallocated Corporate	Total
Revenue	$ 21,427	$ 16,220	$ —	$ 37,647
Operating expenses	56,025	31,672	7,143	94,840
Adjusted EBITDA[(1)]	(26,386)	(7,427)	(3,285)	(37,098)
Reconciliation of Net Loss to Adjusted EBITDA:				
Net loss	$ (34,597)	$ (15,452)	$ (7,651)	$ (57,700)
Net loss attributable to noncontrolling interest	—	—	1	1
Net loss attributable to Adaptive Biotechnologies Corporation	(34,597)	(15,452)	(7,650)	(57,699)
Interest and other income, net	—	—	(3,024)	(3,024)
Interest expense	—	—	3,531	3,531
Depreciation and amortization expense	2,056	2,753	614	5,423
Share-based compensation expense	6,155	5,272	3,244	14,671
Adjusted EBITDA[(1)]	$ (26,386)	$ (7,427)	$ (3,285)	$ (37,098)

[(1)]Adjusted EBITDA is a non-GAAP financial measure. See "Adjusted EBITDA" below for an explanation for how it is calculated and used by management.

Components of Results of Operations

Revenue

We derive revenue by providing diagnostic and research services in our MRD and Immune Medicine business areas. Our MRD revenue consists of revenue generated from (1) providing our clonoSEQ report to clinical customers; (2) providing MRD sample testing services to biopharmaceutical customers and certain academic institutions, including investigator-led clinical trials; and (3) providing our clonoSEQ report or results to certain international laboratory sites through technology transfers. We disclose our clonoSEQ test volume, which includes the number of clonoSEQ reports and results we have provided to ordering physicians in the United States ("U.S.") and international technology transfer sites. These volumes do not include sample results from our biopharmaceutical customers or academic institutions utilizing our MRD services. Our Immune Medicine revenue consists of revenue generated from (1) providing sample testing services for our commercial research product, Adaptive Immunosequencing, to biopharmaceutical customers and academic institutions; and (2) our collaboration agreements with Genentech and other biopharmaceutical customers in areas of drug and target discovery.

For our clinical customers, we primarily derive revenue from providing our clonoSEQ report to ordering physicians. We bill commercial, government and medical institution payors based on reports delivered to ordering physicians. Amounts paid for clonoSEQ by commercial, government and medical institution payors vary based on respective reimbursement rates and patient responsibilities, which may differ from our targeted list price. We recognize clinical revenue by evaluating customer payment history, contracted reimbursement rates, if applicable, and other adjustments to estimate the amount of revenue that is collectible.

For our clonoSEQ coverage under Medicare, we bill an episode of treatment when we deliver the first eligible test report. This billing contemplates all necessary tests required during a patient's treatment cycle, which is currently estimated at approximately four tests per patient, including the initial sequence identification test. Revenue recognition commences at the time the initial billable test report is delivered and is based upon cumulative tests delivered to date. Any unrecognized revenue from the initial billable test is recorded as deferred revenue and recognized either as we deliver our estimate of the remaining tests in a patient's treatment cycle or when the likelihood becomes remote that a patient will receive additional testing.

For our research customers, which include biopharmaceutical customers and academic institutions for both our MRD and Adaptive Immunosequencing services, delivery of the respective test results may include some level of professional support and analysis. Terms with biopharmaceutical customers generally include non-refundable payments made in advance of services ("upfront payments"), which we record as deferred revenue. For all research customers, we recognize revenue as we deliver sequencing results. From time to time, we offer discounts in order to gain rights and access to certain datasets. Revenue is recognized net of these discounts and costs associated with these services are reflected in cost of revenue. In periods where our sample estimates are reduced or a customer project is cancelled and, in either case, we have remaining related deferred revenue, we recognize revenue using a cumulative catch-up approach based on the proportion of samples delivered to date relative to the total samples expected to be delivered. Certain of our MRD revenue arrangements with biopharmaceutical customers include cash consideration from the achievement of regulatory milestones of the respective biopharmaceutical customers' therapeutics. Such revenue is constrained from recognition until it becomes probable that such milestone will be achieved.

Under certain agreements with our biopharmaceutical customers who seek access to our platform to support their therapeutic development activities, revenues are generated from research and development support services that we provide. These agreements may include substantial non-refundable upfront payments, which we recognize over time as we perform the respective services. Revenue recognized from these activities relate primarily to the Genentech Agreement.

We expect our MRD revenue to increase in the long term as we continue to increase our MRD clinical testing volume through increased penetration in our existing covered patient populations, expand into new patient populations and optimize payor coverage. Our MRD revenue may fluctuate period to period due to the uncertain timing of receipt of our biopharmaceutical customer samples, which may cause uncertainty in the delivery of our products and services, the recognition of milestones related to regulatory approvals of our biopharmaceutical customers' therapeutics and changes in estimates of our clinical revenue reimbursement rates.

We expect our Immune Medicine revenue to decrease in the short term primarily due to our expected reduction in revenue generated from the Genentech Agreement. Over the long term, we expect our Immune Medicine revenue to increase as we or our collaborators advance therapies to commercialization. Our Immune Medicine revenue may fluctuate from period to period due to the timing of expenses incurred, changes in estimates of total anticipated costs related to the Genentech Agreement and other events not within our control, including the recognition of milestones under the Genentech Agreement and the timing of receipt of customer samples from our biopharmaceutical customers.

Cost of Revenue

Cost of revenue includes the cost of materials, personnel-related expenses (including salaries, benefits and share-based compensation), shipping and handling expenses, equipment costs, allocated facility costs associated with processing samples and professional support costs related to our service revenue activities. Allocated facility costs include depreciation of laboratory equipment, as well as allocated facility occupancy and information technology costs. Costs associated with processing samples are recorded as expense, regardless of the timing of revenue recognition. As such, cost of revenue and related volume does not always trend in the same direction as revenue recognition and related volume. Additionally, costs to support the Genentech Agreement are a component of our research and development expenses.

We expect cost of revenue to increase in absolute dollars in the long term as we grow our sample testing volume, but the cost per sample to decrease over the long term due to the efficiencies we may gain as assay volume increases from improved utilization of our laboratory capacity, automation and other value engineering initiatives. If our sample volume throughput is reduced, cost of revenue as a percentage of total revenue may be adversely impacted due to fixed overhead costs.

Research and Development Expenses

Research and development expenses consist of laboratory materials costs, personnel-related expenses (including salaries, benefits and share-based compensation), equipment costs, allocated facility and information technology costs and contract service expenses. Research and development activities support further development and refinement of existing assays and products, discovery of new technologies and investments in our immune medicine platform. We also include in research and development expenses the costs associated with software development of applications to support future commercial opportunities, as well as development activities to support laboratory scaling and workflow. We are currently conducting research and development activities for several products and services and we typically use our laboratory materials, personnel, facilities, information technology and other development resources across multiple development programs. Additionally, certain of these research and development activities benefit more than one of our product opportunities. We have not historically tracked research and development expenses by specific product candidates.

The costs to support the Genentech Agreement are a component of our research and development expenses. Additionally, a component of our research and development expenses are costs supporting clinical and analytical validations to obtain regulatory approval for future clinical products and services. Some of these activities have generated and may in the future generate revenue.

We expect research and development expenses to decrease in the short term and to decrease as a percentage of revenue in the long term, although the percentage may fluctuate from period to period due to the timing and extent of our development and commercialization efforts.

Sales and Marketing Expenses

Sales and marketing expenses include personnel-related expenses (including salaries, benefits and share-based compensation) for commercial sales, product and account management, marketing, reimbursement, medical education and business development personnel that support commercialization of our platform products. In addition, these expenses include external costs such as advertising expenses, customer education and promotional expenses, market analysis expenses, conference fees, travel expenses and allocated facility and information technology costs.

We expect sales and marketing expenses to remain relatively consistent in the short term. In the long term, we expect sales and marketing expenses to increase in absolute dollars as we increase marketing activities to drive awareness and adoption of our products and services. However, we expect sales and marketing expenses to decrease as a percentage of revenue in the long term, subject to fluctuations from period to period due to the timing and magnitude of these expenses.

General and Administrative Expenses

General and administrative expenses include personnel-related expenses (including salaries, benefits and share-based compensation) for our personnel in executive, legal, finance and accounting, human resources and other administrative functions, including third-party clinical billing services. In addition, these expenses include insurance costs, external legal costs, accounting and tax service expenses, consulting fees and allocated facility and information technology costs.

We expect general and administrative expenses to remain relatively consistent in the short term and to decrease as a percentage of revenue in the long term.

Interest Expense

Interest expense includes costs associated with our revenue interest liability related to the Purchase Agreement and noncash interest costs associated with the amortization of the related deferred issuance costs. We impute interest expense using the effective interest rate method. We calculate an effective interest rate which will amortize our related obligation to zero over the anticipated repayment period. A significant increase or decrease in or changes in timing of forecasted revenue will prospectively impact our interest expense.

Statements of Operations Data and Other Financial and Operating Data

The following table sets forth our statements of operations data and other financial and operating data for the periods presented (in thousands, except share and per share amounts):

	Three Months Ended March 31,	
	2024	2023
Statements of Operations Data:		
Revenue	$ 41,873	$ 37,647
Operating expenses		
Cost of revenue	18,051	18,681
Research and development	30,245	32,601
Sales and marketing	22,319	22,308
General and administrative	19,597	20,831
Amortization of intangible assets	423	419
Total operating expenses	90,635	94,840
Loss from operations	(48,762)	(57,193)
Interest and other income, net	4,222	3,024
Interest expense	(2,993)	(3,531)
Net loss	(47,533)	(57,700)
Add: Net loss attributable to noncontrolling interest	26	1
Net loss attributable to Adaptive Biotechnologies Corporation	$ (47,507)	$ (57,699)
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.33)	$ (0.40)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	145,787,527	143,511,142
Other Financial and Operating Data:		
Adjusted EBITDA[(1)]	$ (28,180)	$ (37,098)

[(1)] Adjusted EBITDA is a non-GAAP financial measure that we define as net loss attributable to Adaptive Biotechnologies Corporation adjusted for interest and other income, net, interest expense, income tax (expense) benefit, depreciation and amortization expense, impairment costs for right-of-use and related long-lived assets, restructuring expense and share-based compensation expense. See “Adjusted EBITDA” below for a reconciliation between Adjusted EBITDA and net loss attributable to Adaptive Biotechnologies Corporation, the most directly comparable GAAP financial measure, and a discussion about the limitations of Adjusted EBITDA.

Comparison of the Three Months Ended March 31, 2024 and 2023

Revenue

(in thousands, except percentages)	Three Months Ended March 31,		Change		Percent of Revenue	
	2024	2023	$	%	2024	2023
MRD revenue						
Service revenue	$ 28,126	$ 21,427	$ 6,699	31%		
Regulatory milestone revenue	4,500	—	4,500	*		
Total MRD revenue	32,626	21,427	11,199	52	78%	57%
Immune Medicine revenue						
Service revenue	4,559	7,102	(2,543)	(36)		
Collaboration revenue	4,688	9,118	(4,430)	(49)		
Total Immune Medicine revenue	9,247	16,220	(6,973)	(43)	22%	43%
Total revenue	$ 41,873	$ 37,647	$ 4,226	11	100%	100%

* Not applicable

The $11.2 million increase in MRD revenue was primarily due to a $5.9 million increase in revenue generated from providing clonoSEQ to clinical customers, a $4.5 million increase in revenue recognized upon the achievement of regulatory milestones by one of our biopharmaceutical customers and a $1.4 million increase in revenue generated from providing MRD sample testing services to biopharmaceutical customers. These increases were partially offset by a $0.6 million decrease in revenue generated from providing MRD sample testing services to investigator-led clinical trials. Our clonoSEQ test volume increased by 41% to 17,040 tests delivered in the three months ended March 31, 2024 from 12,079 tests delivered in the three months ended March 31, 2023.

The $7.0 million decrease in Immune Medicine revenue was primarily due to a $4.4 million decrease in revenue generated from the Genentech Agreement, which resulted from decreased collaboration expenses, and a $2.5 million decrease in revenue generated from our biopharmaceutical and academic customers.

Cost of Revenue

(in thousands, except percentages)	Three Months Ended March 31,		Change		Percent of Revenue	
	2024	2023	$	%	2024	2023
Cost of revenue	$ 18,051	$ 18,681	$ (630)	(3)%	43%	50%

The $0.6 million decrease in cost of revenue was primarily attributable to a $1.2 million decrease in overhead and labor costs, which was largely driven by reduced headcount and laboratory relocation and consolidation activities, and a $0.6 million decrease in cost of materials largely due to a reduction in inventory reserve expense. These decreases were partially offset by a $0.6 million increase in materials cost resulting from increased revenue sample volume and a $0.2 million increase related to higher usage of our production laboratory to process revenue samples versus research and development samples.

Research and Development

(in thousands, except percentages)	Three Months Ended March 31,		Change		Percent of Revenue	
	2024	2023	$	%	2024	2023
Research and development	$ 30,245	$ 32,601	$ (2,356)	(7)%	72%	87%

The following table presents disaggregated research and development expenses by cost classification for the periods presented:

(in thousands)	Three Months Ended March 31,		Change
	2024	2023	
Research and development materials and allocated production laboratory expenses	$ 4,989	$ 6,106	$ (1,117)
Personnel expenses	18,823	19,031	(208)
Allocable facilities and information technology expenses	2,830	2,707	123
Software and cloud services expenses	1,289	984	305
Depreciation and other expenses	2,314	3,773	(1,459)
Total	$ 30,245	$ 32,601	$ (2,356)

The $2.4 million decrease in research and development expenses was primarily attributable to a $1.2 million decrease in costs related to collaboration studies related to Immune Medicine, which was the primary driver of the $1.5 million decrease in depreciation and other expenses, and a $1.1 million decrease in cost of materials and allocated production laboratory expenses, which was driven primarily by decreased investments in drug discovery efforts, including collaboration efforts with Genentech, and decreased TCR-Antigen Map development activities.

Sales and Marketing

(in thousands, except percentages)	Three Months Ended March 31,		Change		Percent of Revenue	
	2024	2023	$	%	2024	2023
Sales and marketing	$ 22,319	$ 22,308	$ 11	*	53%	59%

* Increase is less than 1%

The nominal increase in sales and marketing expenses was primarily attributable to a $0.8 million increase in computer and software expenses, partially offset by a $0.4 million decrease in travel and customer event related expenses and a $0.3 million decrease in personnel costs.

General and Administrative

(in thousands, except percentages)	Three Months Ended March 31,		Change		Percent of Revenue	
	2024	2023	$	%	2024	2023
General and administrative	$ 19,597	$ 20,831	$ (1,234)	(6)%	47%	55%

The $1.2 million decrease in general and administrative expenses was primarily attributable to a $1.3 million decrease in building, facility and depreciation related expenses driven by office space transitions made to support laboratory consolidation activities, partially offset by a $0.6 million increase in third-party billing service fees.

Interest and Other Income, Net

(in thousands, except percentages)	Three Months Ended March 31,		Change	
	2024	2023	$	%
Interest and other income, net	$ 4,222	$ 3,024	$ 1,198	40%

The $1.2 million increase in interest and other income, net was primarily attributable to an increase in net interest income and investment amortization driven by increased interest rates and related yields of our invested cash and cash equivalents and marketable securities.

Interest Expense

(in thousands, except percentages)	Three Months Ended March 31,		Change	
	2024	2023	$	%
Interest expense	$ (2,993)	$ (3,531)	$ 538	(15)%

The $0.5 million decrease in interest expense was attributable to a change in our assumptions regarding the timeframe in which our Purchase Agreement will be fully repaid.

Segment Adjusted EBITDA

(in thousands, except percentages)	Three Months Ended March 31,		Change	
	2024	2023	$	%
MRD Adjusted EBITDA[(1)]	$ (17,259)	$ (26,386)	$ 9,127	(35)%
Immune Medicine Adjusted EBITDA[(1)]	(6,927)	(7,427)	500	(7)

[(1)]Adjusted EBITDA is a non-GAAP financial measure. See “Adjusted EBITDA” below for an explanation for how it is calculated and used by management.

The $9.1 million increase in MRD Adjusted EBITDA was primarily attributable to an $11.2 million increase in MRD revenue, partially offset by an increase in MRD operating expenses. The $0.5 million increase in Immune Medicine Adjusted EBITDA was primarily attributable to reductions in Immune Medicine operating expenses driven primarily by reduced research and development expenses, partially offset by a $7.0 million decrease in Immune Medicine revenue.

Adjusted EBITDA

Adjusted EBITDA is a non-GAAP financial measure that we define as net loss attributable to Adaptive Biotechnologies Corporation adjusted for interest and other income, net, interest expense, income tax (expense) benefit, depreciation and amortization expense, impairment costs for right-of-use and related long-lived assets, restructuring expense and share-based compensation expense. We define our segment Adjusted EBITDA in the same way to the extent the net loss attributable to Adaptive Biotechnologies Corporation and adjustments are allocable to each segment. See Note 13, *Segment Information* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report for more information regarding segment Adjusted EBITDA.

Management uses Adjusted EBITDA, including segment Adjusted EBITDA, to evaluate the financial performance of our business and segments and to evaluate the effectiveness of our strategies. We present these figures because we believe it is frequently used by analysts, investors and other interested parties to evaluate companies in our industry and it facilitates comparisons on a consistent basis across reporting periods. Further, we believe it is helpful in highlighting trends in our operating results because it excludes items that are not indicative of our core operating performance.

Adjusted EBITDA, including segment Adjusted EBITDA, has limitations as an analytical tool and you should not consider it in isolation or as a substitute for analysis of our results as reported under GAAP. We may in the future incur expenses similar to the adjustments we make. In particular, we expect to incur meaningful share-based compensation expense in the future. Other limitations include that Adjusted EBITDA does not reflect:

- all expenditures or future requirements for capital expenditures or contractual commitments;
- changes in our working capital needs;
- interest expense, which is an ongoing element of our costs to operate;
- income tax (expense) benefit, which may be a necessary element of our costs and ability to operate;
- the costs of replacing the assets being depreciated and amortized, which will often have to be replaced in the future;
- the noncash component of employee compensation expense;
- right-of-use and related long-lived assets impairment costs; and
- the impact of earnings or charges resulting from matters we consider not to be reflective, on a recurring basis, of our ongoing operations, such as our restructuring activities and reductions in workforce.

In addition, Adjusted EBITDA may not be comparable to similarly titled measures used by other companies in our industry or across different industries.

The following is a reconciliation of net loss attributable to Adaptive Biotechnologies Corporation, the most directly comparable GAAP financial measure, to Adjusted EBITDA for the periods presented (in thousands):

	Three Months Ended March 31,	
	2024	2023
Net loss attributable to Adaptive Biotechnologies Corporation	$ (47,507)	$ (57,699)
Interest and other income, net	(4,222)	(3,024)
Interest expense[1]	2,993	3,531
Depreciation and amortization expense	5,214	5,423
Restructuring expense[2]	1,044	—
Share-based compensation expense[3]	14,298	14,671
Adjusted EBITDA	$ (28,180)	$ (37,098)

[1] Represents costs associated with our revenue interest liability and noncash interest costs associated with the amortization of the related deferred issuance costs. See Note 8, *Revenue Interest Purchase Agreement* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report for details on the Purchase Agreement.

[2] Represents costs associated with our organizational realignment to our two segments initiated in the three months ended March 31, 2024. These costs primarily related to one-time termination benefits and ongoing benefit arrangements.

(3) Represents share-based compensation expense related to stock option, restricted stock unit and market-based restricted stock unit awards. See Note 11, *Equity Incentive Plans* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report for details on our share-based compensation expense.

Liquidity and Capital Resources

We have incurred losses since inception and have incurred negative cash flows from operations since inception through March 31, 2024, with the exception of certain 2019 periods for which we had positive cash flows from operations. As of March 31, 2024, we had an accumulated deficit of $1.2 billion.

We have funded our operations to date principally from the sale of convertible preferred stock and common stock, and, to a lesser extent, revenue and proceeds from the Purchase Agreement. Pursuant to the Purchase Agreement entered into in September 2022, we received net cash proceeds of $124.4 million, after deducting issuance costs. We are also entitled to receive up to $125.0 million in subsequent installments as follows: (i) $75.0 million upon our request occurring no later than September 12, 2025 and (ii) $50.0 million upon our request in connection with certain permitted acquisitions occurring no later than September 12, 2025, in each case subject to certain funding conditions. As of March 31, 2024, we had cash, cash equivalents and marketable securities of $308.9 million.

We believe our existing cash, cash equivalents and marketable securities will be sufficient to fund our operating expenses and capital expenditure requirements through at least the next 12 months. We may consider raising additional capital to expand our business, to pursue strategic investments, to take advantage of financing opportunities or for other reasons.

If our available cash, cash equivalents and marketable securities balances and anticipated cash flows are insufficient to satisfy our liquidity requirements, we may request an additional installment under the Purchase Agreement, seek to sell additional equity or convertible debt securities, enter into a credit facility or another form of third-party funding or seek other debt financing. The sale of equity and convertible debt securities may result in dilution to our shareholders and, in the case of preferred equity securities or convertible debt, those securities could provide for rights, preferences or privileges senior to those of our common stock. The terms of debt securities issued or borrowings pursuant to a credit agreement could impose significant restrictions on our operations. This additional capital may not be available on reasonable terms, or at all.

We plan to utilize the existing cash, cash equivalents and marketable securities on hand primarily to fund our commercial and marketing activities associated with clonoSEQ, our continued investments in streamlining our laboratory operations and our continued research and development initiatives related to drug discovery. Cash in excess of immediate requirements is invested in accordance with our investment policy, primarily with a view to capital preservation and liquidity. Currently, our funds are held in money market funds and marketable securities consisting of U.S. government treasury securities, commercial paper and corporate bonds.

While we may experience variability in revenue in the near term, over the long-term we expect revenue from our current and future products and services to grow. Accordingly, we expect our accounts receivable and inventory balances to increase. Our levels of accounts receivable may fluctuate relative to our revenue for a number of reasons, including the timing of milestone triggers and related payment of those milestones, as well as reductions in revenue derived from the upfront payment received under the Genentech Agreement and an increase in revenue generated from clinical customers, which may result in more billings in arrears as opposed to upfront payments. Any increase in accounts receivable and inventory may not be completely offset by increases in accounts payable and accrued expenses, which could result in greater working capital requirements.

Contractual Obligations

There have been no material changes outside the ordinary course of business to our contractual obligations and commitments as previously disclosed in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024.

See Note 7, *Leases* and Note 8, *Revenue Interest Purchase Agreement* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report for more information regarding our contractual obligations relating to lease agreements and the Purchase Agreement, respectively.

Cash Flows

The following table summarizes our uses and sources of cash for the three months ended March 31, 2024 and 2023 (in thousands):

	Three Months Ended March 31,	
	2024	2023
Net cash used in operating activities	$ (38,353)	$ (59,152)
Net cash provided by investing activities	44,509	62,979
Net cash provided by financing activities	44	672

Operating Activities

Cash used in operating activities during the three months ended March 31, 2024 was $38.4 million, which was primarily attributable to a net loss of $47.5 million and a net change in operating assets and liabilities of $10.3 million, partially offset by noncash share-based compensation of $14.3 million, noncash depreciation and amortization of $2.6 million, noncash lease expense of $1.4 million and noncash interest expense related to the Purchase Agreement of $0.9 million. The net change in operating assets and liabilities was primarily driven by a $4.1 million increase in accounts receivable, net, which includes $4.5 million in regulatory milestones recognized during the three months ended March 31, 2024, a $3.9 million reduction in accounts payable and accrued liabilities driven largely by the payout of our corporate bonus during the three months ended March 31, 2024, a $2.5 million decrease in operating lease right-of-use assets and liabilities and a $2.4 million reduction in deferred revenue. These changes were partially offset by a $1.5 million decrease in prepaid expenses and other current assets, which was driven largely by a decrease in prepaid software charges, and a $1.1 million decrease in inventory.

Cash used in operating activities during the three months ended March 31, 2023 was $59.2 million, which was primarily attributable to a net loss of $57.7 million and a net change in operating assets and liabilities of $24.5 million, partially offset by noncash share-based compensation of $14.7 million, noncash depreciation and amortization of $3.8 million, noncash lease expense of $1.8 million, noncash interest expense related to the Purchase Agreement of $1.6 million and inventory reserve expense of $1.1 million. The net change in operating assets and liabilities was primarily driven by a $15.9 million reduction in accounts payable and accrued liabilities driven largely by the payout of our corporate bonus during the three months ended March 31, 2023, an $8.5 million reduction in deferred revenue related primarily to revenue recognized from the Genentech Agreement, a $6.6 million increase in inventory and a $2.2 million decrease in operating lease right-of-use assets and liabilities. These changes were partially offset by a $9.1 million decrease in accounts receivable, net primarily related to collections from our biopharmaceutical customers, including receipt of an MRD milestone payment.

Investing Activities

Cash provided by investing activities during the three months ended March 31, 2024 was $44.5 million, which was primarily attributable to proceeds from maturities of marketable securities of $99.5 million, partially offset by purchases of marketable securities of $53.5 million and purchases of property and equipment of $1.5 million.

Cash provided by investing activities during the three months ended March 31, 2023 was $63.0 million, which was primarily attributable to proceeds from maturities of marketable securities of $155.0 million, partially offset by purchases of marketable securities of $89.1 million and purchases of property and equipment of $2.9 million.

Financing Activities

Cash provided by financing activities during the three months ended March 31, 2024 was attributable to proceeds from the exercise of stock options.

Cash provided by financing activities during the three months ended March 31, 2023 was $0.7 million, which was attributable to proceeds from the exercise of stock options.

Net Operating Loss Carryforwards

Utilization of our net operating loss ("NOL") carryforwards and credits may be subject to a substantial annual limitation due to the ownership change limitations provided by Section 382 of the Internal Revenue Code of 1986 ("Section 382") and similar state provisions. The annual limitation may result in the expiration of NOL carryforwards and credits before utilization. If there should be an ownership change, our ability to utilize our NOL carryforwards and credits could be limited. We have completed a Section 382 analysis for changes in ownership through December 31, 2023 and continue to monitor for changes that could trigger a limitation. Based on this analysis, we do not expect to have any permanent limitations on the utilization of our federal NOLs. Under the Tax Cuts and Jobs Act of 2017, federal NOLs incurred in 2018 and future years may be carried forward indefinitely, but the deductibility of such federal NOLs is subject to an annual limitation. NOLs generated prior to 2018 are eligible to be carried forward up to 20 years. Based on the available objective evidence, management determined that it was more likely than not that the net deferred tax assets would not be realizable as of December 31, 2023. Accordingly, management applied a full valuation allowance against net deferred tax assets as of December 31, 2023.

Critical Accounting Policies and Estimates

We have prepared the unaudited condensed consolidated financial statements in accordance with GAAP. Our preparation of these unaudited condensed consolidated financial statements requires us to make estimates, assumptions and judgments that affect the reported amounts of assets, liabilities and related disclosures at the date of the unaudited condensed consolidated financial statements, as well as revenue and expense recorded during the reporting periods. We evaluate our estimates and judgments on an ongoing basis. We base our estimates on historical experience and other relevant assumptions that we believe to be reasonable under the circumstances. Estimates are used in several areas, including, but not limited to, estimates of progress to date for certain performance obligations and the transaction price for certain contracts with customers, imputing interest for the Purchase Agreement, the provision for income taxes, including related reserves, the analysis of goodwill impairment and the recoverability and impairment of long-lived assets, among others. These estimates generally involve complex issues and require judgments, involve the analysis of historical results and prediction of future trends, can require extended periods of time to resolve and are subject to change from period to period. Actual results may differ materially from management's estimates.

While our significant accounting policies are described in more detail in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024, as well as in Note 2, *Significant Accounting Policies* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report, we believe the following accounting policies are critical to the judgments and estimates used in the preparation of the unaudited condensed consolidated financial statements:

- revenue recognition;
- imputing interest for the Purchase Agreement; and
- goodwill.

There have been no material changes to our critical accounting policies and estimates as previously disclosed in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024.

Recent Accounting Pronouncements

See Note 2, *Significant Accounting Policies* of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report for more information.

Item 3. Quantitative and Qualitative Disclosures About Market Risk

Interest Rate Risk

We are exposed to market risk for changes in interest rates related primarily to our cash and cash equivalents and marketable securities. As of March 31, 2024, there have been no material changes to our market risks as previously disclosed in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024. We do not enter into investments for trading purposes and have not used any derivative financial instruments to manage our interest rate risk exposure.

Item 4. Controls and Procedures

Under the supervision and with the participation of our management, including our chief executive officer and chief financial officer, we evaluated the effectiveness of the design and operation of our disclosure controls and procedures pursuant to Rule 13a-15 under the Securities Exchange Act of 1934, as amended (the "Exchange Act") as of the end of the period covered by this report. Based on that evaluation, our chief executive officer and chief financial officer have concluded that our disclosure controls and procedures were effective as of March 31, 2024. There was not any change in our internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Exchange Act) during the three months ended March 31, 2024 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

PART II—OTHER INFORMATION

Item 1. Legal Proceedings

From time to time, we may be subject to legal proceedings. We are not currently a party to or aware of any proceedings that we believe will have, individually or in the aggregate, a material adverse effect on our business, financial condition or results of operations. Regardless of outcome, litigation can have an adverse impact on us because of defense and settlement costs, diversion of management resources and other factors.

Item 1A. Risk Factors

Investing in our common stock involves a high degree of risk. We operate in a rapidly changing environment that involves a number of risks that could materially affect our business, financial condition or future results, some of which are beyond our control. In addition to the other information set forth in this report, the risks and uncertainties that we believe are most important for you to consider are discussed in Part I, Item 1A under the caption "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024. The risk factors may be important to understanding other statements in this report and should be read in conjunction with the unaudited condensed consolidated financial statements and related notes in this report. The occurrence of any single risk or any combination of risks could materially and adversely affect our business, operations, product pipeline, operating results, financial condition or liquidity, and consequently, the value of our securities. Further, additional risks that we currently do not know about or that we currently believe to be immaterial may also impair our business, financial condition, operating results and prospects. There have been no material changes to the risk factors described in our Annual Report on Form 10-K for the year ended December 31, 2023 filed with the SEC on February 29, 2024.

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

Not applicable.

Item 3. Defaults Upon Senior Securities

Not applicable.

Item 4. Mine Safety Disclosures

Not applicable**.**

Item 5. Other Information

Not applicable.

Item 6. Exhibits

Exhibit Number	Exhibit Title	Incorporated by Reference				Filed/ Furnished with This Report
		Form	File No.	Exhibit	Filing Date	
3.1	Amended and Restated Articles of Incorporation	8-K	001-38957	3.1	7/1/2019	
3.2	Amended and Restated Bylaws	8-K	001-38957	3.2	7/1/2019	
4.1	Seventh Amended and Restated Investors' Rights Agreement among the Registrant and certain of its shareholders, dated May 30, 2019	S-1	333-231838	4.1	5/30/2019	
31.1	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					X
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					X
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					X
101.INS	Inline XBRL Instance Document – the instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document.					X
101.SCH	Inline XBRL Taxonomy Extension Schema With Embedded Linkbases Document					X
104	Cover Page Interactive Data File (formatted in Inline XBRL and included in Exhibit 101)					X

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ADAPTIVE BIOTECHNOLOGIES CORPORATION

Date: May 7, 2024	By:	***/s/ Chad Robins***
		Chad Robins Chief Executive Officer and Director (Principal Executive Officer)
Date: May 7, 2024	By:	***/s/ Kyle Piskel***
		Kyle Piskel Chief Financial Officer (Principal Financial Officer)

Exhibit 31.1

CERTIFICATION OF THE CHIEF EXECUTIVE OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Chad Robins, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Adaptive Biotechnologies Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are 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: May 7, 2024

By: /s/ Chad Robins
Chad Robins
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

CERTIFICATION OF THE CHIEF FINANCIAL OFFICER
PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Kyle Piskel, certify that:

1. I have reviewed this Quarterly Report on Form 10-Q of Adaptive Biotechnologies Corporation;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
    a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
    b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
    c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
    d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):
    a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are 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: May 7, 2024

By: /s/ Kyle Piskel
Kyle Piskel
Chief Financial Officer
(Principal Financial 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 Adaptive Biotechnologies Corporation (the "Company") on Form 10-Q for the quarterly period ended March 31, 2024 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 to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

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

Date: May 7, 2024

By: /s/ Chad Robins
Chad Robins
Chief Executive Officer
(Principal Executive Officer)

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.

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 Adaptive Biotechnologies Corporation (the "Company") on Form 10-Q for the quarterly period ended March 31, 2024 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 to my knowledge:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

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

Date: May 7, 2024

By: /s/ Kyle Piskel
Kyle Piskel
Chief Financial Officer
(Principal Financial Officer)

The foregoing certification is being furnished solely to accompany the Report pursuant to 18 U.S.C. § 1350, and is not being filed for purposes of Section 18 of the Securities Exchange Act of 1934, as amended, and is not to be incorporated by reference into any filing of the Company, whether made before or after the date hereof, regardless of any general incorporation language in such filing.