UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 10-Q

(Mark One)

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

For the quarterly period ended September 30, 2022

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 October 28, 2022, the registrant had 143,012,157 shares of common stock, $0.0001 par value per share, outstanding.

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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 Immune Medicine and Minimal Residual Disease ("MRD") market opportunities, 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 immunoSEQ, 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 develop a map of the interaction between the immune system and disease ("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 ("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)

	September 30, 2022 (unaudited)	December 31, 2021
Assets		
Current assets		
Cash and cash equivalents	$ 217,552	$ 139,065
Short-term marketable securities (amortized cost of $295,689 and $214,115, respectively)	290,527	213,996
Accounts receivable, net	26,549	17,409
Inventory	17,345	19,263
Prepaid expenses and other current assets	12,407	13,015
Total current assets	564,380	402,748
Long-term assets		
Property and equipment, net	86,662	85,262
Operating lease right-of-use assets	82,605	87,678
Long-term marketable securities (amortized cost of $20,507 and $218,163, respectively)	19,698	217,145
Restricted cash	2,433	2,138
Intangible assets, net	7,256	8,526
Goodwill	118,972	118,972
Other assets	2,202	875
Total assets	$ 884,208	$ 923,344
Liabilities and shareholders' equity		
Current liabilities		
Accounts payable	$ 4,163	$ 3,307
Accrued liabilities	10,702	9,343
Accrued compensation and benefits	12,733	15,642
Current portion of operating lease liabilities	8,528	5,055
Current portion of deferred revenue	67,892	80,460
Total current liabilities	104,018	113,807
Long-term liabilities		
Operating lease liabilities, less current portion	100,521	106,685
Deferred revenue, less current portion	67,300	98,750
Revenue interest liability, net	124,555	—
Total liabilities	396,394	319,242
Commitments and contingencies (Note 10)		
Shareholders' equity		
Preferred stock: $0.0001 par value, 10,000,000 shares authorized at September 30, 2022 and December 31, 2021; no shares issued and outstanding at September 30, 2022 and December 31, 2021	—	—
Common stock: $0.0001 par value, 340,000,000 shares authorized at September 30, 2022 and December 31, 2021; 142,987,127 and 141,393,865 shares issued and outstanding at September 30, 2022 and December 31, 2021, respectively	14	14
Additional paid-in capital	1,372,751	1,324,006
Accumulated other comprehensive loss	(5,971)	(1,137)
Accumulated deficit	(878,954)	(718,891)
Total Adaptive Biotechnologies Corporation shareholders' equity	487,840	603,992
Noncontrolling interest	(26)	110
Total shareholders' equity	487,814	604,102
Total liabilities and shareholders' equity	$ 884,208	$ 923,344

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Revenue	$ 47,830	$ 39,467	$ 130,110	$ 116,414
Operating expenses				
Cost of revenue	14,907	14,189	41,320	34,945
Research and development	35,658	36,072	110,534	107,644
Sales and marketing	21,513	24,949	71,887	68,769
General and administrative	20,755	20,154	66,099	51,156
Amortization of intangible assets	428	428	1,270	1,270
Total operating expenses	93,261	95,792	291,110	263,784
Loss from operations	(45,431)	(56,325)	(161,000)	(147,370)
Interest and other income, net	765	327	1,454	1,429
Interest expense	(653)	—	(653)	—
Net loss	(45,319)	(55,998)	(160,199)	(145,941)
Add: Net loss attributable to noncontrolling interest	38	95	136	95
Net loss attributable to Adaptive Biotechnologies Corporation	$ (45,281)	$ (55,903)	$ (160,063)	$ (145,846)
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.32)	$ (0.40)	$ (1.12)	$ (1.04)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	142,928,654	140,833,564	142,334,342	140,060,379

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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Net loss	$ (45,319)	$ (55,998)	$ (160,199)	$ (145,941)
Other comprehensive loss				
Change in unrealized gains and losses on investments	(171)	(209)	(4,834)	(886)
Comprehensive loss	(45,490)	(56,207)	(165,033)	(146,827)
Add: Comprehensive loss attributable to noncontrolling interest	38	95	136	95
Comprehensive loss attributable to Adaptive Biotechnologies Corporation	$ (45,452)	$ (56,112)	$ (164,897)	$ (146,732)

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 Comprehensive Gain (Loss)	Accumulated	Noncontrolling	Total
	Shares	Amount	Paid-In Capital		Deficit	Interest	Shareholders' Equity
Balance at June 30, 2021	140,663,755	$ 14	$ 1,294,506	$ 216	$ (601,555)	$ 129	$ 693,310
Issuance of common stock for cash upon exercise of stock options	360,607	—	2,797	—	—	—	2,797
Vesting of restricted stock units	3,125	—	—	—	—	—	—
Common stock option and restricted stock unit share-based compensation	—	—	11,643	—	—	—	11,643
Other comprehensive loss	—	—	—	(209)	—	—	(209)
Net loss	—	—	—	—	(55,903)	(95)	(55,998)
Balance at September 30, 2021	141,027,487	$ 14	$ 1,308,946	$ 7	$ (657,458)	$ 34	$ 651,543
Balance at June 30, 2022	142,784,868	$ 14	$ 1,357,763	$ (5,800)	$ (833,673)	$ 12	$ 518,316
Issuance of common stock for cash upon exercise of stock options	131,802	—	846	—	—	—	846
Vesting of restricted stock units	70,457	—	—	—	—	—	—
Common stock option, restricted stock unit and market-based restricted stock unit share-based compensation	—	—	14,142	—	—	—	14,142
Other comprehensive loss	—	—	—	(171)	—	—	(171)
Net loss	—	—	—	—	(45,281)	(38)	(45,319)
Balance at September 30, 2022	142,987,127	$ 14	$ 1,372,751	$ (5,971)	$ (878,954)	$ (26)	$ 487,814

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

Adaptive Biotechnologies Corporation

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

	Common Stock		Additional	Accumulated Other Comprehensive Gain (Loss)	Accumulated	Noncontrolling	Total
	Shares	Amount	Paid-In Capital		Deficit	Interest	Shareholders' Equity
Balance at December 31, 2020	137,646,896	$ 14	$ 1,253,971	$ 893	$ (511,612)	$ —	$ 743,266
Issuance of common stock upon exercise of common stock warrant	54,162	—	—	—	—	—	—
Issuance of common stock for cash upon exercise of stock options	3,310,804	—	23,299	—	—	—	23,299
Vesting of restricted stock units	15,625	—	—	—	—	—	—
Common stock option and restricted stock unit share-based compensation	—	—	31,376	—	—	—	31,376
Capital contributions for Digital Biotechnologies, Inc.	—	—	300	—	—	129	429
Other comprehensive loss	—	—	—	(886)	—	—	(886)
Net loss	—	—	—	—	(145,846)	(95)	(145,941)
Balance at September 30, 2021	141,027,487	$ 14	$ 1,308,946	$ 7	$ (657,458)	$ 34	$ 651,543
Balance at December 31, 2021	141,393,865	$ 14	$ 1,324,006	$ (1,137)	$ (718,891)	$ 110	$ 604,102
Issuance of common stock for cash upon exercise of stock options	1,361,891	—	7,562	—	—	—	7,562
Vesting of restricted stock units	231,371	—	—	—	—	—	—
Common stock option, restricted stock unit and market-based restricted stock unit share-based compensation	—	—	41,183	—	—	—	41,183
Other comprehensive loss	—	—	—	(4,834)	—	—	(4,834)
Net loss	—	—	—	—	(160,063)	(136)	(160,199)
Balance at September 30, 2022	142,987,127	$ 14	$ 1,372,751	$ (5,971)	$ (878,954)	$ (26)	$ 487,814

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)

	Nine Months Ended September 30,	
	2022	2021
Operating activities		
Net loss	$ (160,199)	$ (145,941)
Adjustments to reconcile net loss to net cash used in operating activities		
Depreciation expense	14,364	7,834
Noncash lease expense	5,423	5,259
Share-based compensation expense	41,183	31,376
Intangible assets amortization	1,270	1,270
Investment amortization	1,825	5,956
Research and development inventory reserve	2,638	—
Interest expense	653	—
Other	(20)	(9)
Changes in operating assets and liabilities		
Accounts receivable, net	(9,139)	(7,075)
Inventory	(2,212)	(4,168)
Prepaid expenses and other current assets	601	(2,239)
Accounts payable and accrued liabilities	(3,419)	5,518
Operating lease right-of-use assets and liabilities	(3,041)	9,935
Deferred revenue	(44,018)	(46,345)
Other	165	(272)
Net cash used in operating activities	(153,926)	(138,901)
Investing activities		
Purchases of property and equipment	(13,807)	(52,501)
Purchases of marketable securities	(113,744)	(238,001)
Proceeds from maturities of marketable securities	228,000	404,500
Net cash provided by investing activities	100,449	113,998
Financing activities		
Proceeds from exercise of stock options	7,568	23,439
Proceeds from revenue interest purchase agreement, net of issuance costs	124,691	—
Proceeds from initial capital contributions for Digital Biotechnologies, Inc.	—	429
Net cash provided by financing activities	132,259	23,868
Net increase (decrease) in cash, cash equivalents and restricted cash	78,782	(1,035)
Cash, cash equivalents and restricted cash at beginning of year	141,203	125,574
Cash, cash equivalents and restricted cash at end of period	$ 219,985	$ 124,539
Noncash investing and financing activities		
Purchases of equipment included in accounts payable and accrued liabilities	$ 2,619	$ 8,133
Revenue interest purchase agreement issuance costs included in accounts payable and accrued liabilities	$ 316	$ —

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 aims to understand precisely how the immune system detects and treats disease in that patient. We capture these insights in our dynamic clinical immunomics database, which is underpinned by computational biology and machine learning, and use them to develop and commercialize clinical products and services that we are tailoring to each individual patient. 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, autoimmune disorders and infectious diseases.

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, 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 between Adaptive Biotechnologies Corporation, our wholly-owned subsidiary and Digital Biotechnologies, Inc. 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, including the fair value of stock, 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, and goodwill, 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 financial statements and notes included in our Annual Report on Form 10-K for the year ended December 31, 2021 filed with the Securities and Exchange Commission ("SEC") on February 15, 2022.

Reclassification

We previously disclosed revenue bifurcated into sequencing and development financial statement captions. Beginning with the reporting period ended March 31, 2022, we changed how we classify revenue and now present total revenue on the unaudited condensed consolidated statements of operations. See Note 3, Revenue for additional disaggregation of revenue under our Immune Medicine and Minimal Residual Disease ("MRD") market opportunities.

Restricted Cash

We had a restricted cash balance of $2.4 million and $2.1 million as of September 30, 2022 and December 31, 2021, 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.

Revenue Interest Liability, Net and Related Imputed Interest

The revenue interest liability balance associated with the Purchase Agreement that we entered into in September 2022 is presented net of issuance costs on our unaudited condensed consolidated balance sheets. We impute our associated 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. The effective interest rate may vary during the term of the agreement depending on a number of factors, including changes in forecasted GAAP revenues. We evaluate the effective interest rate quarterly based on both achieved and forecasted revenues, utilizing the prospective method. A significant increase or decrease in forecasted revenue will materially impact our interest expense and the time period for repayment.

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 debt securities, U.S. government agency securities, commercial paper and corporate bonds 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 September 30,		Nine Months Ended September 30,			
	2022	2021	2022	2021	September 30, 2022	December 31, 2021
Customer B	*%	*%	13.0%	*%	22.5%	11.3%
Customer D	*	*	*	*	11.9	*
Genentech, Inc. and Roche Group	45.1	39.8	38.2	42.6	*	*

* less than 10%

Revenue Recognition

We recognize revenue in accordance with Accounting Standards Codification ("ASC") Topic 606 ("ASC 606"), *Revenue from Contracts with Customers*. Under ASC 606, 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 Immune Medicine and MRD market opportunities. Our Immune Medicine revenue consists of revenue generated from (1) providing sample testing services for our commercial research product, immunoSEQ, to biopharmaceutical customers and academic institutions; (2) providing our T-Detect COVID tests to clinical customers; and (3) our collaboration agreements with Genentech, Inc. ("Genentech") and other biopharmaceutical customers in areas of drug and target discovery. 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.

For research customers who utilize either immunoSEQ or our MRD 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 immunoSEQ or MRD data 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 remaining samples expected to be delivered.

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 medical institutions and commercial and government third-party 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 and assisting in completing a regulatory submission and providing MRD testing services related to customer-provided samples for their 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. 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. 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. 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.

Net Loss Per Share Attributable to Adaptive Biotechnologies Corporation Common Shareholders

We calculate basic net loss per share attributable to our common shareholders by dividing net loss attributable to us by our weighted-average number of shares of common stock outstanding for the period. The diluted net loss per share attributable to our common shareholders is computed by giving effect to all potential dilutive common stock equivalents outstanding for the period determined using the treasury stock method. For purposes of this calculation, outstanding common stock warrants, outstanding stock options, nonvested restricted stock units outstanding and the maximum nonvested market-based restricted stock units outstanding eligible to be earned are considered common stock equivalents but have been excluded from the calculation of diluted net loss per share attributable to our common shareholders, as their effect is anti-dilutive.

3. Revenue

We disaggregate our revenue from contracts with customers by market opportunity 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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Immune Medicine revenue				
Service revenue	$ 6,559	$ 8,169	$ 20,968	$ 17,622
Collaboration revenue	21,320	15,446	50,105	49,137
Total Immune Medicine revenue	27,879	23,615	71,073	66,759
MRD revenue				
Service revenue	19,951	14,352	55,037	39,655
Regulatory milestone revenue	—	1,500	4,000	10,000
Total MRD revenue	19,951	15,852	59,037	49,655
Total revenue	$ 47,830	$ 39,467	$ 130,110	$ 116,414

During the three months ended September 30, 2022, we recognized $1.1 million in MRD service revenue related to cancelled customer contracts, Medicare reimbursements resulting from our determination that the likelihood of additional testing for specific patients was remote and changes in estimates of total samples to be provided under certain of our agreements. During the three months ended September 30, 2021, 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 changes in estimates of total samples to be provided under certain of our agreements.

During the nine months ended September 30, 2022, we recognized $3.7 million in MRD service revenue related to Medicare reimbursements resulting from our determination that the likelihood of additional testing for specific patients was remote, changes in estimates of total samples to be provided under certain of our agreements and cancelled customer contracts. During the nine months ended September 30, 2021, we recognized $5.4 million in MRD service revenue related to changes in estimates of total samples to be provided under certain of our agreements, Medicare reimbursements resulting from our determination that the likelihood of additional testing for specific patients was remote and cancelled customer contracts.

As of September 30, 2022, we could receive up to an additional $370.5 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 and may be eligible to receive more than $1.8 billion over time, including payments of up to $75.0 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 agreement, we are pursuing two product development pathways for novel T cell immunotherapies 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 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 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 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 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 transaction price as of September 30, 2022. We excluded 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 the revenue over a period of approximately seven to eight 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 the 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.

We recognized $20.4 million and $15.0 million in Immune Medicine collaboration revenue during the three months ended September 30, 2022 and 2021, respectively, and $46.5 million and $47.8 million in Immune Medicine collaboration revenue during the nine months ended September 30, 2022 and 2021, 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 our Genentech Agreement represents $39.6 million and $64.0 million of the current and non-current deferred revenue balances, respectively, as of September 30, 2022 and $56.1 million and $94.0 million of the current and non-current deferred revenue balances, respectively, as of December 31, 2021. 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 to five years from September 30, 2022. 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 the various research and development activities.

Changes in deferred revenue during the nine months ended September 30, 2022 were as follows (in thousands):

Deferred revenue balance at December 31, 2021	$	179,210
Additions to deferred revenue during the period		27,994
Revenue recognized during the period		(72,012)
Deferred revenue balance at September 30, 2022	$	135,192

As of September 30, 2022, $58.0 million was recognized as revenue that was included in the deferred revenue balance at December 31, 2021.

5. Fair Value Measurements

The following tables set forth the fair value of financial assets as of September 30, 2022 and December 31, 2021 that were measured at fair value on a recurring basis (in thousands):

	September 30, 2022			
	Level 1	Level 2	Level 3	Total
Financial assets				
Money market funds	$ 197,188	$ —	$ —	$ 197,188
U.S. government debt securities	—	292,940	—	292,940
Corporate bonds	—	17,285	—	17,285
Total financial assets	$ 197,188	$ 310,225	$ —	$ 507,413

	December 31, 2021			
	Level 1	Level 2	Level 3	Total
Financial assets				
Money market funds	$ 131,946	$ —	$ —	$ 131,946
U.S. government debt securities	—	391,145	—	391,145
Corporate bonds	—	39,996	—	39,996
Total financial assets	$ 131,946	$ 431,141	$ —	$ 563,087

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 debt securities 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 September 30, 2022 and December 31, 2021 (in thousands):

	September 30, 2022			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Estimated Fair Value
Short-term marketable securities				
U.S. government debt securities	$ 278,192	$ —	$ (4,950)	$ 273,242
Corporate bonds	17,497	—	(212)	17,285
Total short-term marketable securities	$ 295,689	$ —	$ (5,162)	$ 290,527
Long-term marketable securities				
U.S. government debt securities	$ 20,507	$ —	$ (809)	$ 19,698
Total long-term marketable securities	$ 20,507	$ —	$ (809)	$ 19,698

	December 31, 2021			
	Amortized Cost	Unrealized Gain	Unrealized Loss	Estimated Fair Value
Short-term marketable securities				
U.S. government debt securities	$ 186,752	$ 4	$ (109)	$ 186,647
Corporate bonds	27,363	—	(14)	27,349
Total short-term marketable securities	$ 214,115	$ 4	$ (123)	$ 213,996
Long-term marketable securities				
U.S. government debt securities	$ 205,472	$ —	$ (974)	$ 204,498
Corporate bonds	12,691	—	(44)	12,647
Total long-term marketable securities	$ 218,163	$ —	$ (1,018)	$ 217,145

All the U.S. government debt securities 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 $1.0 million and $1.4 million is presented separately within the prepaid expenses and other current assets balance on the unaudited condensed consolidated balance sheet as of September 30, 2022 and on the condensed consolidated balance sheet as of December 31, 2021, respectively.

The following table presents the gross unrealized holding losses and fair value for investments in an unrealized loss position, and the length of time individual securities have been in a continuous loss position, as of September 30, 2022 (in thousands):

	Less Than 12 Months		12 Months Or Greater	
	Fair Value	Unrealized Loss	Fair Value	Unrealized Loss
U.S. government debt securities	$ 181,925	$ (3,240)	$ 111,015	$ (2,519)
Corporate bonds	9,349	(95)	7,936	(117)
Total available-for-sale securities	$ 191,274	$ (3,335)	$ 118,951	$ (2,636)

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 September 30, 2022, 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 September 30, 2022 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. Goodwill and Intangible Assets

There have been no changes in the carrying amount of goodwill since its recognition in 2015.

Intangible assets subject to amortization as of September 30, 2022 and December 31, 2021 consisted of the following (in thousands):

	September 30, 2022		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Acquired developed technology	$ 20,000	$ (12,884)	$ 7,116
Purchased intellectual property	325	(185)	140
Balance at September 30, 2022	$ 20,325	$ (13,069)	$ 7,256

	December 31, 2021		
	Gross Carrying Amount	Accumulated Amortization	Net Carrying Amount
Acquired developed technology	$ 20,000	$ (11,638)	$ 8,362
Purchased intellectual property	325	(161)	164
Balance at December 31, 2021	$ 20,325	$ (11,799)	$ 8,526

The developed technology was acquired in connection with our acquisition of Sequenta, Inc. in 2015. The remaining balance of the acquired developed technology and the purchased intellectual property is expected to be amortized over the next 4.3 years.

As of September 30, 2022, expected future amortization expense for intangible assets was as follows (in thousands):

2022 (excluding the nine months ended September 30, 2022)	$ 429
2023	1,699
2024	1,703
2025	1,699
2026	1,699
Thereafter	27
Total future amortization expense	$ 7,256

8. Leases

We have operating lease agreements for laboratory, office and warehouse facilities in Seattle, Washington, Bothell, Washington, South San Francisco, California and New York City, New York. As of September 30, 2022, 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 September 30, 2022 (in thousands):

2022 (excluding the nine months ended September 30, 2022)	$ 3,488
2023	13,964
2024	13,692
2025	14,098
2026	12,330
Thereafter	81,188
Total undiscounted lease payments	138,760
Less:	
Imputed interest rate	(28,517)
Tenant improvement receivables	(1,194)
Total operating lease liabilities	109,049
Less: Current portion	(8,528)
Operating lease liabilities, less current portion	$ 100,521

During the nine months ended September 30, 2022, cash paid for amounts included in the measurement of lease liabilities was $6.9 million, net of $4.0 million of cash received for tenant improvement allowances. Cash paid for amounts included in the measurement of lease liabilities was $5.6 million and cash received for tenant improvement allowances was $11.5 million during the nine months ended September 30, 2021.

We previously entered into a $2.1 million letter of credit with one of our financial institutions in connection with one of our leases.

9. Revenue Interest Purchase Agreement

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 million from the Purchasers at closing (the "First Payment"), less certain transaction expenses. We will also be entitled to receive up to $125 million in subsequent installments as follows: (i) $75 million upon our request occurring no later than September 12, 2025 (the “Second Payment”) and (ii) $50 million upon our request in connection with certain permitted acquisitions occurring no later than September 12, 2025 (the “Third Payment”), in each case subject to certain funding conditions. To secure our obligations under the Purchase Agreement, we and our subsidiaries have granted OrbiMed a security interest in our core platform technology assets, subject to certain customary exclusions, as defined in the Purchase Agreement.

Revenue Interest Payments

As consideration for such payments, the Purchasers will have a right to receive certain revenue interests (the “Revenue Interests”) from us based on a percentage (the “Applicable Payment Percentage”) of all GAAP revenue (the “Revenue Base”). If only the First Payment has been made, the Applicable Payment Percentage shall be five percent of the quarterly Revenue Base. If both the First Payment and Second Payment have been made, the Applicable Payment Percentage shall be eight percent of the quarterly Revenue Base. If each of the First, Second and Third Payments have been made, the applicable payment percentage applied to the Revenue Interest shall be ten percent of the quarterly Revenue Base.

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”). If OrbiMed has not received Revenue Interest Payments in the aggregate equal to or greater than the sum of its invested capital (the “Cumulative Purchaser Payments”) on or prior to September 12, 2028, the revenue interest rate shall be increased to a rate which, if applied retroactively to our cumulative Revenue Base, would have resulted in Revenue Interest Payments equal to the sum of all Cumulative Purchaser Payments.

Return Cap

OrbiMed will be entitled to 100% of the Revenue Interest Payments until it has received a total cumulative value of 165% of the Cumulative Purchaser Payments (the “Return Cap”), unless full repayment of the amount of the Return Cap has not been made by September 12, 2032, in which case the Return Cap shall be increased to 175% of the Cumulative Purchaser Payments.

Put/Call Options

Upon the occurrence of a Put Option Event (as defined in the Purchase Agreement), including material divestitures by us, a change in control, material judgments, or bankruptcy events, Purchasers representing at least a majority of the purchase commitments under the Purchase Agreement shall have the right but not the obligation ("the Put Option") to require us to repurchase all of the outstanding Revenue Interests at the applicable price (the “Put/Call Price”). Additionally, at any time following receipt of the First Payment, we may exercise a call option to repurchase all Revenue Interests at the applicable Put/Call Price.

For all Put Option Events other than a change of control or a material divestiture, the Put/Call Price shall be an amount equal to the applicable Return Cap. For a change of control or a material divestiture, prior to March 12, 2024, the Put/Call Price shall be an amount equal to 120% of the Cumulative Purchaser Payments less the sum of all Revenue Interest Payments made by us to the Purchasers prior to such date, between March 12, 2024 and September 12, 2024, the Put/Call Price shall be an amount equal to 125% of the Cumulative Purchaser Payments less the sum of all Revenue Interest Payments made by us to the Purchasers prior to such date, and after September 12, 2024, the Put/Call Price shall be equal to the applicable Return Cap.

Accounting Treatment

We evaluated the terms of the Purchase Agreement and concluded that the features of the Cumulative Purchaser Payments are similar to those of a debt instrument. Accordingly, we accounted for the transaction as long-term debt recorded at amortized cost using the effective interest rate method. We further evaluated the terms of the debt and determined that the Put Option that is exercisable by the Purchasers upon certain contingent events requires bifurcation as a derivative. However, the value of the Put Option was determined to be immaterial due to the remote possibility of exercise. We assess the value of the Put Option periodically.

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, taking into account the forecasted Revenue Interest Payments. The calculated effective interest rate as of September 30, 2022 was 11.5%.

In connection with the Purchase Agreement, we incurred debt issuance costs of $0.6 million. Debt issuance costs have been recorded to long-term 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. Noncash interest expense recognized for the three and nine months ended September 30, 2022 was $0.7 million.

The following table sets forth the revenue interest liability, net activity during the nine months ended September 30, 2022 (in thousands):

Revenue interest liability at inception	$	125,000
Capitalized issuance costs		(625)
Interest expense		653
Revenue interest payable		(473)
Total revenue interest liability, net at September 30, 2022	$	124,555

10. 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 September 30, 2022.

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.

11. 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.

As of September 30, 2022, we had reserved shares of common stock for the following:

Shares issuable upon the exercise of outstanding stock options granted	13,789,307
Shares issuable upon the vesting of outstanding restricted stock units granted and the maximum outstanding market-based restricted stock units eligible to be earned	5,960,617
Shares available for future grant under the 2019 Equity Incentive Plan	14,946,912
Shares available for future grant under the Employee Stock Purchase Plan	2,804,298
Total shares of common stock reserved for future issuance	37,501,134

Our 2019 Equity Incentive Plan ("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 ("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.

Our board of directors determined not to increase the 2019 Plan and ESPP reserves in 2022.

12. Equity Incentive Plans

2009 Equity Incentive Plan

We adopted an equity incentive plan in 2009 ("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 issuance 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 September 30, 2022, we had 29,217,365 shares of common stock authorized for issuance under the 2019 Plan.

Changes in shares available for grant during the nine months ended September 30, 2022 were as follows:

	Shares Available for Grant
Shares available for grant at December 31, 2021	22,299,923
Stock options and restricted stock units granted and the maximum market-based restricted stock units granted eligible to be earned	(10,823,237)
Stock options and restricted stock units forfeited, cancelled or expired	3,470,226
Shares available for grant at September 30, 2022	14,946,912

Stock Options

Stock option activity under the 2009 Plan and 2019 Plan during the nine months ended September 30, 2022 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, 2021	12,778,984	$ 19.72	
Stock options granted	4,423,644	11.67	
Stock options forfeited or cancelled	(1,554,973)	28.64	
Stock options expired	(496,457)	33.05	
Stock options exercised	(1,361,891)	5.55	
Stock options outstanding at September 30, 2022	13,789,307	$ 17.05	$ 4,183
Stock options vested and exercisable at September 30, 2022	7,226,163	$ 14.42	$ 4,178

The weighted-average remaining contractual life for stock options outstanding as of September 30, 2022 was 7.2 years. The weighted-average remaining contractual life for vested and exercisable stock options as of September 30, 2022 was 5.6 years.

Of the $23.4 million proceeds from the exercise of stock options included on the unaudited condensed consolidated statements of cash flows for the nine months ended September 30, 2021, $0.3 million related to options exercised prior to but settled during the nine months ended September 30, 2021. As of September 30, 2021, there was $0.1 million in unsettled cash proceeds related to options exercised during the nine months ended September 30, 2021.

Restricted Stock Units

Restricted stock unit activity under the 2019 Plan during the nine months ended September 30, 2022 was as follows:

	Restricted Stock Units Outstanding	Weighted-Average Grant Date Fair Value per Share
Nonvested restricted stock units outstanding at December 31, 2021	1,211,191	$ 37.41
Restricted stock units granted	5,905,359	11.72
Restricted stock units forfeited or cancelled	(1,418,796)	16.44
Restricted stock units vested	(231,371)	39.40
Nonvested restricted stock units outstanding at September 30, 2022	5,466,383	$ 15.01

Market-Based Restricted Stock Units

In addition to the restricted stock units described above, our board of directors approved an award of market-based restricted stock units to our chief executive officer in March 2022. The shares of common stock that may be earned under the award, ranging from zero shares to 494,234 shares, are calculated based upon 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 the award agreement, vesting is subject to our chief executive officer's continuous service through the end of the three-year performance period.

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 nine months ended September 30, 2022 and 2021 were estimated using the Black-Scholes option-pricing model with the following assumptions:

	Nine Months Ended September 30,	
	2022	**2021**
Fair value of common stock	$7.30 - $14.95	$30.86 - $66.50
Expected term (in years)	5.27 - 6.08	5.27 - 6.08
Risk-free interest rate	1.7% - 3.0%	0.5% - 1.1%
Expected volatility	68.2% - 71.0%	67.1% - 70.0%
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 complex, subjective and generally require significant 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 is based on 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 nine months ended September 30, 2022 and 2021 was $7.36 and $25.25, 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 nine months ended September 30, 2022 and 2021 was $11.72 and $40.21, respectively.

The grant date fair value of the market-based restricted stock units granted in March 2022 is $18.89 and was determined using a Monte Carlo valuation model, which uses assumptions such as volatility, risk-free interest rate and dividend estimated for the performance period. The related share-based compensation expense of $4.7 million is recognized on a straight-line basis over the three-year performance period, which is also the requisite service period. Attainment of the 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 our chief executive officer does not provide continuous service through the performance period for reasons other than those expressly provided in the terms of the award.

The compensation cost related to stock options, restricted stock units and market-based restricted stock units for the three and nine months ended September 30, 2022 and 2021, respectively, are included on the unaudited condensed consolidated statements of operations as follows (in thousands):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Cost of revenue	$ 1,058	$ 650	$ 2,807	$ 1,386
Research and development	4,382	3,637	13,370	10,311
Sales and marketing	3,357	3,369	10,170	9,166
General and administrative	5,345	3,987	14,836	10,513
Total share-based compensation expense	$ 14,142	$ 11,643	$ 41,183	$ 31,376

As of September 30, 2022, 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	$ 74,954	2.65
Nonvested restricted stock units	69,624	3.22
Nonvested market-based restricted stock units	3,774	2.43

13. Restructuring

In March 2022, we began implementing a restructuring plan to reduce operating costs and drive future growth aligned with the strategic reorganization of our business around our MRD and Immune Medicine market opportunities. Under this restructuring plan, we reduced our workforce by approximately 100 employees.

We incurred aggregate restructuring costs of $2.0 million, all of which was recognized in the six months ended June 30, 2022. These costs primarily related to one-time termination benefits and ongoing benefit arrangements, both of which included severance payments and extended benefits coverage support and were contingent upon the impacted employees' execution and non-revocation of separation agreements. Our aggregate restructuring costs also included certain contract termination costs.

The activities related to our reduction in workforce were primarily completed in March 2022 and the $2.0 million aggregate restructuring costs were paid as of June 30, 2022.

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

The following table sets forth the computation of the basic and diluted net loss per share attributable to our common shareholders for the three and nine months ended September 30, 2022 and 2021, respectively (in thousands, except share and per share amounts):

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Net loss attributable to Adaptive Biotechnologies Corporation	$ (45,281)	$ (55,903)	$ (160,063)	$ (145,846)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	142,928,654	140,833,564	142,334,342	140,060,379
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.32)	$ (0.40)	$ (1.12)	$ (1.04)

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 and nine months ended September 30, 2022 and 2021, respectively, as they had an anti-dilutive effect:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Stock options outstanding	13,996,403	12,901,028	13,984,427	13,205,328
Nonvested restricted stock units outstanding	5,486,711	795,469	4,490,170	572,194
Maximum nonvested market-based restricted stock units outstanding eligible to be earned	494,234	—	381,990	—
Common stock warrant outstanding	—	—	—	11,458
Total	19,977,348	13,696,497	18,856,587	13,788,980

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 aims to understand precisely how the immune system detects and treats disease in that patient. We capture these insights in our dynamic clinical immunomics database, which is underpinned by computational biology and machine learning, and use them to develop and commercialize clinical products and services that we are tailoring to each individual patient. 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, autoimmune disorders and infectious diseases.

Our immune medicine platform is the foundation for our expanding suite of products and services. The cornerstone of our platform and core immunosequencing product, immunoSEQ, serves as our underlying research and development engine and generates revenue from biopharmaceutical and academic customers.

Leveraging our collaboration with Microsoft, we are creating the TCR-Antigen Map. We are using this map to develop research solutions by disease, called immunoSEQ T-MAP, and a diagnostic product for many diseases from a single blood test, called T-Detect, for which we have launched two indications: T-Detect COVID, which is designed to confirm past SARS-CoV-2 infection, and T-Detect Lyme, which is designed to help diagnose early Lyme disease.

Our therapeutic product candidates, being developed under our worldwide collaboration and license agreement with Genentech (the "Genentech Agreement"), leverage our platform to identify specific receptors on immune cells to develop into cellular therapies in oncology. We also extended our platform to identify highly potent neutralizing antibodies against SARS-CoV-2 and we believe this differentiated approach may be leveraged across multiple disease states.

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. 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 and international technology transfer sites. These volumes do not include sample results from our biopharmaceutical customers or academic institutions utilizing our MRD services.

We are actively pursuing opportunities to deepen our relationships with current customers and initiate relationships with new customers. We have an experienced, specialty salesforce that is targeting department heads, laboratory directors, principal investigators, core facility directors, clinicians, payors, research scientists and pathologists at leading academic and research institutions, biopharmaceutical companies and contract research organizations. As MRD assessment becomes standard practice for patient management across a range of blood cancers, we believe it will be essential for clinicians and patients to have access to a highly accurate, sensitive and standardized MRD assessment tool. We are focused on establishing and maintaining collaborative relationships with payors, developing health economic evidence and building billing and patient access infrastructure to expand reimbursement coverage for our clinical diagnostics. We continue to seek expanded coverage of our clonoSEQ diagnostic test and have successfully expanded coverage through contractual agreements or positive medical policies with Medicare and several of the largest national private health insurers in the United States.

We recognized revenue of $47.8 million and $39.5 million for the three months ended September 30, 2022 and 2021, respectively, and $130.1 million and $116.4 million for the nine months ended September 30, 2022 and 2021, respectively. Net loss attributable to Adaptive Biotechnologies Corporation was $45.3 million and $55.9 million for the three months ended September 30, 2022 and 2021, respectively, and $160.1 million and $145.8 million for the nine months ended September 30, 2022 and 2021, 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. As of September 30, 2022 and December 31, 2021, we had cash, cash equivalents and marketable securities of $527.8 million and $570.2 million, respectively.

Revenue Interest Purchase Agreement

In September 2022, we entered into a revenue interest purchase agreement (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 million from the Purchasers at closing (the "First Payment"), less certain transaction expenses. We will also be entitled to receive up to $125 million in subsequent installments as follows: (i) $75 million upon our request occurring no later than September 12, 2025 (the "Second Payment") and (ii) $50 million upon our request in connection with certain permitted acquisitions occurring no later than September 12, 2025 (the "Third Payment"), in each case subject to certain funding conditions.

As consideration for such payments, the Purchasers will have a right to receive certain revenue interests (the "Revenue Interests") from us based on a percentage (the "Applicable Payment Percentage") of all revenue as measured in accordance with accounting principles generally accepted in the Unites States of America ("GAAP") (the "Revenue Base"). If only the First Payment has been made, the Applicable Payment Percentage shall be five percent of the quarterly Revenue Base. If both the First Payment and Second Payment have been made, the Applicable Payment Percentage shall be eight percent of the quarterly Revenue Base. If each of the First, Second and Third Payments have been made, the applicable payment percentage applied to the Revenue Interest shall be ten percent of the quarterly Revenue Base.

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"). If OrbiMed has not received Revenue Interest Payments in the aggregate equal to or greater than the sum of its invested capital (the "Cumulative Purchaser Payments") on or prior to September 12, 2028, the revenue interest rate shall be increased to a rate which, if applied retroactively to our cumulative Revenue Base, would have resulted in Revenue Interest Payments equal to the sum of all Cumulative Purchaser Payments.

OrbiMed will be entitled to 100% of the Revenue Interest Payments until it has received a total cumulative value of 165% of the Cumulative Purchaser Payments (the "Return Cap"), unless full repayment of the amount of the Return Cap has not been made by September 12, 2032, in which case the Return Cap shall be increased to 175% of the Cumulative Purchaser Payments.

In addition, the Purchase Agreement contains various representations and warranties, information rights, non-financial covenants, indemnification obligations and other provisions that are customary for a transaction of this nature.

Revenue Reclassification and clonoSEQ Test Volume

We previously disclosed revenue bifurcated into sequencing and development financial statement captions. Beginning with the reporting period ended March 31, 2022, we changed how we classify revenue and now present total revenue on the unaudited condensed consolidated statements of operations included elsewhere in this report. We disaggregate revenue under our Immune Medicine and MRD market opportunities in Note 3 of the accompanying notes to the unaudited condensed consolidated financial statements included elsewhere in this report.

The following table presents the amount of sequencing revenue and development revenue recognized under our Immune Medicine and MRD market opportunities for the periods presented (in thousands):

	Three Months Ended			
	December 31, 2021	September 30, 2021	June 30, 2021	March 31, 2021
Immune Medicine revenue				
Sequencing revenue	$ 6,860	$ 8,170	$ 5,404	$ 4,048
Development revenue	14,514	15,445	17,635	16,057
Total Immune Medicine revenue	21,374	23,615	23,039	20,105
MRD revenue				
Sequencing revenue	16,201	13,936	13,151	11,126
Development revenue	355	1,916	2,315	7,211
Total MRD revenue	16,556	15,852	15,466	18,337
Total revenue	$ 37,930	$ 39,467	$ 38,505	$ 38,442

	Three Months Ended			
	December 31, 2020	September 30, 2020	June 30, 2020	March 31, 2020
Immune Medicine revenue				
Sequencing revenue	$ 3,310	$ 3,691	$ 2,036	$ 3,170
Development revenue	17,155	12,438	12,856	11,077
Total Immune Medicine revenue	20,465	16,129	14,892	14,247
MRD revenue				
Sequencing revenue	9,399	7,585	5,949	6,299
Development revenue	321	2,585	147	364
Total MRD revenue	9,720	10,170	6,096	6,663
Total revenue	$ 30,185	$ 26,299	$ 20,988	$ 20,910

We also previously disclosed the number of clonoSEQ reports provided to ordering physicians in the United States, referred to as “clinical sequencing volume” or “clinical sequencing volume, excluding T-Detect COVID volume” in the “Management’s Discussion and Analysis of Financial Condition and Results of Operations” section of certain of our SEC filings. Beginning with the reporting period ended March 31, 2022, we changed our disclosures related to volume metrics and now present the number of clonoSEQ reports and results we have provided to ordering physicians in the United States and international technology transfer sites, collectively referred to as “clonoSEQ test volume.” Our clonoSEQ test volume does not include sample results from our biopharmaceutical customers or academic institutions utilizing our MRD services.

The following table presents our clonoSEQ test volume for the periods presented:

	Three Months Ended			
	December 31, 2021	September 30, 2021	June 30, 2021	March 31, 2021
Clinical sequencing volume, excluding T-Detect COVID volume	6,356	5,928	5,475	4,757
clonoSEQ reports or results provided to international technology transfer sites	494	413	422	543
clonoSEQ test volume	6,850	6,341	5,897	5,300

	Three Months Ended			
	December 31, 2020	September 30, 2020	June 30, 2020	March 31, 2020
Clinical sequencing volume	4,509	4,023	3,136	3,518
clonoSEQ reports or results provided to international technology transfer sites	704	375	310	238
clonoSEQ test volume	5,213	4,398	3,446	3,756

Components of Results of Operations

Revenue

We derive revenue by providing diagnostic and research services in our Immune Medicine and MRD market opportunities. Our Immune Medicine revenue consists of revenue generated from (1) providing sample testing services for our commercial research product, immunoSEQ, to biopharmaceutical customers and academic institutions; (2) providing our T-Detect COVID tests to clinical customers; and (3) our collaboration agreements with Genentech and other biopharmaceutical customers in areas of drug and target discovery. 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.

For our research customers, which include biopharmaceutical customers and academic institutions for both our immunoSEQ and MRD 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 remaining samples expected to be delivered. Certain of our MRD revenue arrangements with biopharmaceutical customers include consideration in the form of regulatory milestones upon regulatory approval of the respective biopharmaceutical partners' 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 our Genentech Agreement.

For our clinical customers, we primarily derive revenue from providing our clonoSEQ report to ordering physicians. We bill medical institutions and commercial and government payors based on reports delivered to ordering physicians. Amounts paid for clonoSEQ by medical institutions and commercial and government 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.

We expect revenue to increase over the long term. Our revenue may fluctuate from period to period due to the uncertain nature of delivery of our products and services, the achievement of milestones by our customers, timing of expenses incurred, changes in estimates of total anticipated costs related to our Genentech Agreement and other events not within our control, such as the delivery of customer samples or customer decisions to no longer pursue their development initiatives.

Due to the ongoing uncertainties related to the COVID-19 pandemic, we may experience variability in revenue in the near term as our customers' abilities to procure samples for their research initiatives change, as customer initiatives evolve and as clinical testing is impacted by the pandemic.

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 for 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 our Genentech Agreement are a component of our research and development expenses.

We expect cost of revenue to increase in absolute dollars as we grow our sample testing volume and make investments in laboratory automation and facilities, 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, equipment costs, allocated facility costs, information technology expenses 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 do not track research and development expenses by specific product candidates.

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. Additionally, the costs to support our Genentech Agreement are a component of our research and development expenses. Some of these activities have generated and may in the future generate Immune Medicine collaboration revenue.

We expect research and development expenses to experience decreases 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 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 costs.

We expect sales and marketing expenses to experience modest increases 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 billing services. In addition, these expenses include insurance costs, external legal costs, accounting and tax service expenses, consulting fees and allocated facility costs.

We expect general and administrative expenses to experience nominal fluctuations 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 and noncash interest costs associated with the amortization of the related deferred issuance costs. We impute the related 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 forecasted revenue will materially 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 September 30,		Nine Months Ended September 30,	
	2022	2021	2022	2021
Statements of Operations Data:				
Revenue	$ 47,830	$ 39,467	$ 130,110	$ 116,414
Operating expenses				
Cost of revenue	14,907	14,189	41,320	34,945
Research and development	35,658	36,072	110,534	107,644
Sales and marketing	21,513	24,949	71,887	68,769
General and administrative	20,755	20,154	66,099	51,156
Amortization of intangible assets	428	428	1,270	1,270
Total operating expenses	93,261	95,792	291,110	263,784
Loss from operations	(45,431)	(56,325)	(161,000)	(147,370)
Interest and other income, net	765	327	1,454	1,429
Interest expense	(653)	—	(653)	—
Net loss	(45,319)	(55,998)	(160,199)	(145,941)
Add: Net loss attributable to noncontrolling interest	38	95	136	95
Net loss attributable to Adaptive Biotechnologies Corporation	$ (45,281)	$ (55,903)	$ (160,063)	$ (145,846)
Net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	$ (0.32)	$ (0.40)	$ (1.12)	$ (1.04)
Weighted-average shares used in computing net loss per share attributable to Adaptive Biotechnologies Corporation common shareholders, basic and diluted	142,928,654	140,833,564	142,334,342	140,060,379
Other Financial and Operating Data:				
Adjusted EBITDA[(1)]	$ (25,868)	$ (41,059)	$ (102,024)	$ (106,795)

[(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, restructuring expense and share-based compensation expense. Please refer to “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 September 30, 2022 and 2021

Revenue

(in thousands, except percentages)	Three Months Ended September 30,		Change		Percent of Revenue	
	2022	2021	$	%	2022	2021
Immune Medicine revenue						
Service revenue	$ 6,559	$ 8,169	$ (1,610)	(20)%		
Collaboration revenue	21,320	15,446	5,874	38		
Total Immune Medicine revenue	27,879	23,615	4,264	18	58%	60%
MRD revenue						
Service revenue	19,951	14,352	5,599	39		
Regulatory milestone revenue	—	1,500	(1,500)	(100)		
Total MRD revenue	19,951	15,852	4,099	26	42%	40%
Total revenue	$ 47,830	$ 39,467	$ 8,363	21	100%	100%

The $4.3 million increase in Immune Medicine revenue was primarily due to a $5.4 million increase in revenue generated from the Genentech Agreement due to increased collaboration expenses and a $1.3 million increase in revenue generated from our biopharmaceutical and academic customers, which were partially offset by a $2.5 million decrease in revenue generated from our T-Detect COVID clinical customers.

The $4.1 million increase in MRD revenue was primarily due to a $3.3 million increase in revenue generated from providing our clonoSEQ report to clinical customers and a $2.5 million increase in revenue generated from providing MRD sample testing services to biopharmaceutical customers. These increases were partially offset by a $1.5 million decrease in revenue recognized upon the achievement of certain regulatory milestones by our biopharmaceutical customers' therapeutics. Our clonoSEQ test volume increased by 52% to 9,649 tests delivered in the three months ended September 30, 2022 from 6,341 tests delivered in the three months ended September 30, 2021.

Cost of Revenue

(in thousands, except percentages)	Three Months Ended September 30,		Change		Percent of Revenue	
	2022	2021	$	%	2022	2021
Cost of revenue	$ 14,907	$ 14,189	$ 718	5%	31%	36%

The $0.7 million increase in cost of revenue was primarily attributable to a $2.2 million increase in labor and overhead costs, a $0.9 million increase in cost of materials related to mix to higher cost assays and a $0.3 million increase related to higher usage of our production laboratory to process revenue samples versus research and development samples. These increases were partially offset by a $1.7 million decrease in materials cost resulting from decreased revenue sample volume and a $0.8 million decrease in certain sample collection costs.

Research and Development

(in thousands, except percentages)	Three Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
Research and development	$ 35,658	$ 36,072	$ (414)	(1)%	75%	91%

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

(in thousands)	Three Months Ended September 30, 2022	2021	Change
Research and development materials and allocated production laboratory expenses	$ 10,138	$ 12,620	$ (2,482)
Personnel expenses	16,534	16,184	350
Allocable facilities and information technology expenses	2,616	1,560	1,056
Software and cloud services expenses	729	825	(96)
Depreciation and other expenses	5,641	4,883	758
Total	$ 35,658	$ 36,072	$ (414)

The $0.4 million decrease in research and development expenses was primarily attributable to a $2.5 million decrease in cost of materials and allocated production laboratory expenses driven primarily by decreased investments in T-Detect and TCR-Antigen Map development activities, which were partially offset by an increase in drug discovery expenditures primarily related to the Genentech Agreement. This decrease was partially offset by a $1.1 million increase in allocable facility expenses and a $0.8 million increase in depreciation and other expenses, which was driven primarily by a $0.5 million increase in depreciation expense and a $0.5 million increase in consultant costs.

Sales and Marketing

(in thousands, except percentages)	Three Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
Sales and marketing	$ 21,513	$ 24,949	$ (3,436)	(14)%	45%	63%

The $3.4 million decrease in sales and marketing expenses was primarily attributable to a $3.1 million decrease in marketing expenses driven primarily by reduced clonoSEQ marketing efforts, as well as reduced corporate and T-Detect marketing activities. There was also a $0.4 million decrease in consultant costs and a $0.3 million decrease in travel and customer event related expenses, which were partially offset by a $0.4 million increase in people costs.

General and Administrative

(in thousands, except percentages)	Three Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
General and administrative	$ 20,755	$ 20,154	$ 601	3%	43%	51%

The $0.6 million increase in general and administrative expenses was primarily attributable to a $0.7 million increase in computer and software expenses, a $0.5 million increase in personnel costs and a $0.5 million increase in building, facility and depreciation related expenses, which were partially offset by a $0.6 million decrease in insurance costs and a $0.3 million decrease in consultant costs.

Interest and Other Income, Net

(in thousands, except percentages)	Three Months Ended September 30, 2022	2021	Change $	Change %
Interest and other income, net	$ 765	$ 327	$ 438	134%

The $0.4 million increase in interest and other income, net was primarily attributable to an increase in net interest income and investment amortization resulting from a larger portfolio.

Interest Expense

(in thousands, except percentages)	Three Months Ended September 30, 2022	2021	Change $	Change %
Interest expense	$ (653)	$ —	$ (653)	(100)%

The $0.7 million increase in interest expense was attributable to the Purchase Agreement entered into during the three months ended September 30, 2022.

Comparison of the Nine Months Ended September 30, 2022 and 2021

Revenue

(in thousands, except percentages)	Nine Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
Immune Medicine revenue						
Service revenue	$ 20,968	$ 17,622	$ 3,346	19%		
Collaboration revenue	50,105	49,137	968	2		
Total Immune Medicine revenue	71,073	66,759	4,314	6	55%	57%
MRD revenue						
Service revenue	55,037	39,655	15,382	39		
Regulatory milestone revenue	4,000	10,000	(6,000)	(60)		
Total MRD revenue	59,037	49,655	9,382	19	45%	43%
Total revenue	$ 130,110	$ 116,414	$ 13,696	12	100%	100%

The $4.3 million increase in Immune Medicine revenue was primarily due to an $8.5 million increase in revenue generated from our biopharmaceutical and academic customers, which was partially offset by a $2.8 million decrease in revenue generated from our T-Detect COVID clinical customers and a $1.3 million decrease in revenue generated from the Genentech Agreement due to reduced collaboration expenses.

The $9.4 million increase in MRD revenue was primarily due to a $10.7 million increase in revenue generated from providing our clonoSEQ report to clinical customers and a $5.3 million increase in revenue generated from providing MRD sample testing services to biopharmaceutical customers. These increases were partially offset by a $6.0 million decrease in revenue recognized upon the achievement of certain regulatory milestones by our biopharmaceutical customers' therapeutics and a $0.8 million decrease in revenue generated from providing MRD sample testing services to investigator-led clinical trials. Our clonoSEQ test volume increased by 50% to 26,345 tests delivered in the nine months ended September 30, 2022 from 17,538 tests delivered in the nine months ended September 30, 2021.

Cost of Revenue

(in thousands, except percentages)	Nine Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
Cost of revenue	$ 41,320	$ 34,945	$ 6,375	18%	32%	30%

The $6.4 million increase in cost of revenue was primarily attributable to a $4.1 million increase in labor, overhead and facility costs, a $2.4 million increase in cost of materials related to mix to higher cost assays and a $0.5 million increase related to higher usage of our production laboratory to process revenue samples versus research and development samples. These increases were partially offset by a $0.9 million decrease in certain sample collection costs.

Research and Development

(in thousands, except percentages)	Nine Months Ended September 30, 2022	2021	Change $	Change %	Percent of Revenue 2022	2021
Research and development	$ 110,534	$ 107,644	$ 2,890	3%	85%	92%

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

	Nine Months Ended September 30,		
(in thousands)	2022	2021	Change
Research and development materials and allocated production laboratory expenses	$ 35,623	$ 40,453	$ (4,830)
Personnel expenses	51,826	46,107	5,719
Allocable facilities and information technology expenses	6,495	4,750	1,745
Software and cloud services expenses	2,132	2,682	(550)
Depreciation and other expenses	14,458	13,652	806
Total	$ 110,534	$ 107,644	$ 2,890

The $2.9 million increase in research and development expenses was primarily attributable to a $5.7 million increase in personnel costs, of which $0.7 million related to our restructuring activities, a $1.7 million increase in allocable facility expenses and a $0.8 million increase in depreciation and other expenses, which was driven primarily by a $1.6 million increase in depreciation expense and a $0.9 million increase in consultant costs, which were partially offset by a $1.3 million decrease in collaboration and medical advisory costs. These increases were partially offset by a $4.8 million decrease in cost of materials and allocated production laboratory expenses, which was driven primarily by decreased investments in drug discovery, clonoSEQ and T-Detect and TCR-Antigen Map development activities.

Sales and Marketing

	Nine Months Ended September 30,		Change		Percent of Revenue	
(in thousands, except percentages)	2022	2021	$	%	2022	2021
Sales and marketing	$ 71,887	$ 68,769	$ 3,118	5%	55%	59%

The $3.1 million increase in sales and marketing expenses was primarily attributable to $7.5 million in additional personnel costs, of which $0.9 million related to our restructuring activities, as well as a $2.1 million increase in travel and customer event related expenses. These increases were partially offset by a $6.3 million decrease in marketing expenses driven primarily by reduced clonoSEQ, corporate and T-Detect marketing activities.

General and Administrative

	Nine Months Ended September 30,		Change		Percent of Revenue	
(in thousands, except percentages)	2022	2021	$	%	2022	2021
General and administrative	$ 66,099	$ 51,156	$ 14,943	29%	51%	44%

The $14.9 million increase in general and administrative expenses was primarily attributable to an $8.3 million increase in building, facility and depreciation related expenses, as well as a $4.5 million increase in personnel costs, a $2.1 million increase in computer and software expenses and a $0.9 million increase in consultant costs. These increases were partially offset by a $1.1 million decrease in legal and accounting fees.

Interest and Other Income, Net

	Nine Months Ended September 30,		Change	
(in thousands, except percentages)	2022	2021	$	%
Interest and other income, net	$ 1,454	$ 1,429	$ 25	2%

Interest and other income, net did not significantly change period over period.

Interest Expense

(in thousands, except percentages)	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021	Change $	Change %
Interest expense	$ (653)	$ —	$ (653)	(100)%

The $0.7 million increase in interest expense was attributable to the Purchase Agreement entered into during the three months ended September 30, 2022.

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, restructuring expense and share-based compensation expense.

Management uses Adjusted EBITDA to evaluate the financial performance of our business and the effectiveness of our business strategies. We present Adjusted EBITDA 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 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 in the presentation of Adjusted EBITDA. 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 may be a necessary and ongoing element of our costs and ability 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; 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 March 2022 restructuring and reduction 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 to Adjusted EBITDA for the periods presented (in thousands):

	Three Months Ended September 30, 2022	Three Months Ended September 30, 2021	Nine Months Ended September 30, 2022	Nine Months Ended September 30, 2021
Net loss attributable to Adaptive Biotechnologies Corporation	$ (45,281)	$ (55,903)	$ (160,063)	$ (145,846)
Interest and other income, net	(765)	(327)	(1,454)	(1,429)
Interest expense	653	—	653	—
Depreciation and amortization expense	5,383	3,528	15,634	9,104
Restructuring expense [(1)]	—	—	2,023	—
Share-based compensation expense [(2)]	14,142	11,643	41,183	31,376
Adjusted EBITDA	$ (25,868)	$ (41,059)	$ (102,024)	$ (106,795)

[(1)] Represents expenses recognized in conjunction with restructuring activities. See Note 13 of the accompanying notes to our unaudited condensed consolidated financial statements included elsewhere in this report for details on our restructuring expense.
[(2)] Represents share-based compensation expense related to stock option, restricted stock unit and market-based restricted stock unit awards. See Note 12 of the accompanying notes to our 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 September 30, 2022, with the exception of certain 2019 periods for which we had positive cash flows from operations. As of September 30, 2022, we had an accumulated deficit of $879.0 million.

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 our Purchase Agreement. Pursuant to the Purchase Agreement entered into with OrbiMed in September 2022, we received net cash proceeds of $124.7 million, after deducting certain issuance costs. As of September 30, 2022, we had cash, cash equivalents and marketable securities of $527.8 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 from operations are insufficient to satisfy our liquidity requirements, we may 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 continued research and development initiatives for our pipeline candidates and drug discovery initiatives, our ongoing investments in our immune medicine platform and our commercial and marketing activities associated with our clinical products and services. We also expect to make capital expenditures in the near term related to our laboratory space and expect to continue investing in laboratory equipment to support our anticipated growth. 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 United States government debt securities and corporate bonds.

While we may experience variability in revenue in the near term, as long-term revenue from sales of our current and future products and services is expected to grow, we expect our accounts receivable and inventory balances to increase. 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

Other than the contractual obligations set forth below, 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, 2021 filed with the SEC on February 15, 2022.

Pursuant to the Purchase Agreement entered into during September 2022, the Purchasers will have a right to receive Revenue Interests from us based on the Applicable Payment Percentage of the Revenue Base. If only the First Payment has been made, the Applicable Payment Percentage shall be five percent of the quarterly Revenue Base. If both the First Payment and Second Payment have been made, the Applicable Payment Percentage shall be eight percent of the quarterly Revenue Base. If each of the First, Second and Third Payments have been made, the applicable payment percentage applied to the Revenue Interest shall be ten percent of the quarterly Revenue Base.

Revenue Interest Payments shall be made quarterly within 45 days following the end of each fiscal quarter. If OrbiMed has not received Revenue Interest Payments in the aggregate equal to or greater than the Cumulative Purchaser Payments on or prior to September 12, 2028, the revenue interest rate shall be increased to a rate which, if applied retroactively to our cumulative Revenue Base, would have resulted in Revenue Interest Payments equal to the sum of all Cumulative Purchaser Payments.

OrbiMed will be entitled to 100% of the Revenue Interest Payments until it has received the Return Cap, unless full repayment of the amount of the Return Cap has not been made by September 12, 2032, in which case the Return Cap shall be increased to 175% of the Cumulative Purchaser Payments.

As projected revenues change from our initial estimates, the amount of the obligation and timing of payment is likely to change.

See Note 8 and Note 9 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 our Purchase Agreement, respectively.

Cash Flows

The following table summarizes our uses and sources of cash for the nine months ended September 30, 2022 and 2021 (in thousands):

	Nine Months Ended September 30,	
	2022	2021
Net cash used in operating activities	$ (153,926)	$ (138,901)
Net cash provided by investing activities	100,449	113,998
Net cash provided by financing activities	132,259	23,868

Operating Activities

Cash used in operating activities during the nine months ended September 30, 2022 was $153.9 million, which was primarily attributable to a net loss of $160.2 million and a net change in our operating assets and liabilities of $61.1 million, partially offset by noncash share-based compensation of $41.2 million, noncash depreciation and amortization of $17.5 million, noncash lease expense of $5.4 million, research and development inventory reserve charge of $2.6 million and noncash interest expense related to our Purchase Agreement of $0.7 million. The net change in our operating assets and liabilities was primarily due to a $44.0 million reduction in deferred revenue primarily related to revenue recognized from the Genentech Agreement, an increase in accounts receivable, net of $9.1 million, a reduction in accounts payable and accrued liabilities of $3.4 million driven largely by the payout of our corporate bonus during the three months ended March 31, 2022, a $3.0 million decrease in operating lease right-of-use assets and liabilities and an increase in inventory of $2.2 million.

Cash used in operating activities during the nine months ended September 30, 2021 was $138.9 million, which was primarily attributable to a net loss of $145.9 million and a net change in operating assets and liabilities of $44.6 million, partially offset by noncash share-based compensation of $31.4 million, noncash depreciation and amortization of $15.1 million and noncash lease expense of $5.3 million. The net change in operating assets and liabilities was primarily due to a $46.3 million reduction in deferred revenue primarily related to revenue recognized from the Genentech Agreement, an increase in accounts receivable, net of $7.1 million, an increase in inventory of $4.2 million and increases in prepaid expenses and other current assets of $2.2 million, all of which were partially offset by an increase in operating lease right-of-use assets and liabilities of $9.9 million and an increase in accounts payable and accrued liabilities of $5.5 million.

Investing Activities

Cash provided by investing activities during the nine months ended September 30, 2022 was $100.4 million, which was primarily attributable to proceeds from maturities of marketable securities of $228.0 million, partially offset by purchases of marketable securities of $113.7 million and purchases of property and equipment of $13.8 million.

Cash provided by investing activities during the nine months ended September 30, 2021 was $114.0 million, which was primarily attributable to proceeds from maturities of marketable securities of $404.5 million, partially offset by purchases of marketable securities of $238.0 million and purchases of property and equipment of $52.5 million.

Financing Activities

Cash provided by financing activities during the nine months ended September 30, 2022 was $132.3 million, which was attributable to $124.7 million in proceeds from our Purchase Agreement entered into during September 2022, net of settled issuance costs, as well as $7.6 million in proceeds from the exercise of stock options.

Cash provided by financing activities during the nine months ended September 30, 2021 was $23.9 million, which was primarily attributable to proceeds from the exercise of stock options of $23.4 million.

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, 2020 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, 2021. Accordingly, management applied a full valuation allowance against net deferred tax assets as of December 31, 2021.

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 or 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 our Purchase Agreement, the provision for income taxes, including related reserves, and goodwill, 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, 2021 filed with the SEC on February 15, 2022, as well as in Note 2 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 our Purchase Agreement; and
- goodwill.

Revenue Interest Liability, Net and Related Imputed Interest

The revenue interest liability balance associated with the Purchase Agreement that we entered into in September 2022 with OrbiMed is presented net of issuance costs on our unaudited condensed consolidated balance sheets. We impute our associated 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. The effective interest rate may vary during the term of the agreement depending on a number of factors, including changes in forecasted GAAP revenues. We evaluate the effective interest rate quarterly based on both achieved and forecasted revenues, utilizing the prospective method. The estimates of future revenues and resulting revenue interest payments are based on key assumptions including population, penetration, probability of success, and sales price, among others. A significant increase or decrease in forecasted revenue will materially impact our interest expense and the time period for repayment.

Other than that detailed above, 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, 2021 filed with the SEC on February 15, 2022.

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, cash equivalents and marketable securities. As of September 30, 2022, 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, 2021 filed with the SEC on February 15, 2022. 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 September 30, 2022. 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 September 30, 2022 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, 2021 filed with the SEC on February 15, 2022. 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. Other than the risk factor set forth below, 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, 2021 filed with the SEC on February 15, 2022.

Our Purchase Agreement with OrbiMed could limit cash flow available for our operations and expose us to risks that could adversely affect our business, financial condition and results of operations.

Our obligations under the Purchase Agreement, entered into with OrbiMed in September 2022, could have significant negative consequences for our security holders and our business, results of operations and financial condition by, among other things,:

- requiring the dedication of a portion of our cash flow from operations to service the Purchase Agreement obligations, which will reduce the amount of cash available for other purposes, and if our cash inflows and capital resources are insufficient to allow us to make required payments, we may have to reduce or delay additional investments in our operations or seek additional capital;
- increasing our vulnerability to adverse economic and industry conditions;
- limiting our ability to obtain additional financing;
- placing us at a possible competitive disadvantage with competitors that are less leveraged than us or have better access to capital; and
- if we fail to comply with the terms of the Purchase Agreement, resulting in an event of default that is not cured or waived, the Purchasers could seek to enforce their security interest.

In addition, the Purchase Agreement contains customary affirmative and negative non-financial covenants and events of default, including covenants and restrictions that, among other things, grant a first-position security interest in our core assets and restrict our ability to incur liens, incur additional indebtedness, make loans and investments, make certain restricted payments or transfer core assets. Additionally, the Purchasers under the Purchase Agreement have an option (the "Put Option") to terminate the Purchase Agreement and to require us to repurchase future Revenue Interests at a price of 120% to 175% of Cumulative Purchaser Payments, less the sum of all Revenue Interest Payments made by us to the Purchasers prior to such date, upon enumerated events such as a bankruptcy event, a material judgment against us, a material divestiture or a change of control. The triggering of the Put Option, including by our failure to comply with these covenants, could permit the Purchasers to declare certain amounts to be immediately due and payable.

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	
10.1	Revenue Interest Purchase Agreement, made and entered into as of September 12, 2022, by and among Adaptive Biotechnologies Corporation, the Purchasers from time to time party hereto, and OrbiMed Royalty & Credit Opportunities IV, LP	8-K	001-38957	10.1	9/12/2022	
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 Document					X
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document					X
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document					X
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document					X
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase 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: November 3, 2022	By:	***/s/ Chad Robins***
		Chad Robins
		Chief Executive Officer and Director (Principal Executive Officer)
Date: November 3, 2022	By:	***/s/ Tycho Peterson***
		Tycho Peterson
		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: November 3, 2022

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, Tycho Peterson, 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: November 3, 2022

By: /s/ Tycho Peterson
Tycho Peterson
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 September 30, 2022 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: November 3, 2022

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 September 30, 2022 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: November 3, 2022

By: /s/ Tycho Peterson
Tycho Peterson
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.