UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, DC 20549

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the quarterly period ended March 31, 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: 001-38753

Moderna, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware	**81-3467528**
(State or Other Jurisdiction of Incorporation or Organization)	(IRS Employer Identification No.)
200 Technology Square **Cambridge, Massachusetts**	**02139**
(Address of Principal Executive Offices)	(Zip Code)

(617) 714-6500
(Registrant's Telephone Number, Including Area Code)

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

Title of each class	Trading symbol(s)	Name of each exchange on which registered
Common stock, par value $0.0001 per share	MRNA	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 Act). **Yes** ☐ **No** ☒

As of April 29, 2022, there were 397,759,517 shares of the registrant's common stock, par value $0.0001 per share, outstanding.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-Q (Form 10-Q), including the section entitled "Management's Discussion and Analysis of Financial Condition and Results of Operations," contains express or implied forward-looking statements within the meaning of the federal securities laws, Section 27A of the Securities Act of 1933, as amended (the Securities Act), and Section 21E of the Securities Exchange Act of 1934, as amended (the Exchange Act). All statements other than statements of historical facts contained in this Form 10-Q are based on our management's belief and assumptions and on information currently available to our management. Although we believe that the expectations reflected in these forward-looking statements are reasonable, these statements relate to future events or our future operational or financial performance, and involve known and unknown risks, uncertainties, and other factors that may cause our actual results, performance, or achievements to be materially different from any future results, performance, or achievements expressed or implied by these forward-looking statements. Forward-looking statements in this Form 10-Q include, but are not limited to, statements about:

- our activities with respect to our COVID-19 vaccine, and our plans and expectations regarding future generations of our COVID-19 vaccine, including boosters, that we may develop in response to variants of the SARS-CoV-2 virus, ongoing clinical development, manufacturing and supply, pricing, commercialization, if approved, regulatory matters (including dosage for vaccines and authorization or approval for boosters), demand for COVID-19 vaccines, and third-party and governmental arrangements and potential arrangements;

- our ability to contract with third-party suppliers, distributors and manufacturers and their ability to perform adequately, particularly with respect to the timely production and delivery of our COVID-19 vaccine, including any variant booster vaccine candidates, if authorized;

- our ability and the ability of third parties with whom we contract to successfully manufacture our commercial products at scale, as well as drug substances, delivery vehicles, development candidates, and investigational medicines for preclinical and clinical use;

- costs associated with the ramping up of manufacturing for our products, including our COVID-19 vaccine, both internal and external, as well as costs associated with winding down or terminating relationships or agreements with third-party manufacturers or suppliers in connection with the production of our COVID-19 vaccine;

- the scope of protection we are able to establish and maintain for intellectual property rights covering our commercial products, investigational medicines and technology;

- the initiation, timing, progress, results, and cost of our research and development programs and our current and future preclinical studies and clinical trials, including statements regarding the timing of initiation and completion of studies or trials and related preparatory work, the period during which the results of the trials will become available, and our research and development programs;

- risks related to the direct or indirect impact of the COVID-19 pandemic or any future large-scale adverse health event, such as the scope and duration of the outbreak, government actions and restrictive measures implemented in response, material delays in diagnoses, initiation or continuation of treatment for diseases that may be addressed by our development candidates and investigational medicines, or in patient enrollment in clinical trials, potential clinical trials, regulatory review or supply chain disruptions, and other potential impacts to our business, the effectiveness or timeliness of steps taken by us to mitigate the impact of the pandemic, and our ability to execute business continuity plans to address disruptions caused by the COVID-19 pandemic or future large-scale adverse health event;

- our anticipated next steps for our development candidates and investigational medicines that may be slowed down due to the impact of the COVID-19 pandemic, including our resources being significantly diverted towards our COVID-19 vaccine efforts, particularly if the federal government seeks to require us to divert such resources;

- our ability to identify research priorities and apply a risk-mitigated strategy to efficiently discover and develop development candidates and investigational medicines, including by applying learnings from one program to our other programs and from one modality to our other modalities;

- our ability to obtain and maintain regulatory approval of our investigational medicines;

- our ability to commercialize our products, if approved;

- the pricing and reimbursement of our medicines, if approved;

- the implementation of our business model, and strategic plans for our business, investigational medicines, and technology;
- the scope of protection we are able to establish and maintain for intellectual property rights covering our investigational medicines and technology;
- estimates of our future expenses, revenues, capital requirements, and our needs for additional financing;
- the potential benefits of strategic collaboration agreements, our ability to enter into strategic collaborations or arrangements, and our ability to attract collaborators with development, regulatory, and commercialization expertise;
- future agreements with third parties in connection with the commercialization of our investigational medicines, if approved;
- the size and growth potential of the markets for our investigational medicines, and our ability to serve those markets;
- our financial performance;
- the rate and degree of market acceptance of our investigational medicines;
- legal and regulatory developments in the United States and foreign countries;
- our ability to produce our products or investigational medicines with advantages in turnaround times or manufacturing cost;
- the success of competing therapies that are or may become available;
- our ability to attract and retain key scientific or management personnel; and
- developments relating to our competitors and our industry.

In some cases, forward-looking statements can be identified by terminology such as “will,” “may,” “should,” “could,” “expects,” “intends,” “plans,” “aims,” “anticipates,” “believes,” “estimates,” “predicts,” “potential,” “continue,” or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words. These statements are only predictions. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties, and other factors, which are, in some cases, beyond our control and which could materially affect results. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under the section entitled “Risk Factors” and elsewhere in this Form 10-Q. If one or more of these risks or uncertainties occur, or if our underlying assumptions prove to be incorrect, actual events or results may vary significantly from those expressed or implied by the forward-looking statements. No forward-looking statement is a promise or a guarantee of future performance.

The forward-looking statements in this Form 10-Q represent our views as of the date of this Form 10-Q. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we have no current intention of doing so except to the extent required by applicable law. You should therefore not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this Form 10-Q.

This Form 10-Q includes statistical and other industry and market data that we obtained from industry publications and research, surveys, and studies conducted by third parties. Industry publications and third-party research, surveys, and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. We have not independently verified the information contained in such sources.

TRADEMARKS

This Form 10-Q contains references to our trademarks and to trademarks belonging to other entities. Solely for convenience, trademarks and trade names referred to may appear without the ® or ™ symbols, but such references are not intended to indicate, in any way, that their respective owners will not assert, to the fullest extent under applicable law, their rights thereto. We do not intend our use or display of other companies’ trade names or trademarks to imply a relationship with, or endorsement or sponsorship of us by, any other companies.

NOTE REGARDING COMPANY REFERENCES

Unless the context otherwise requires, the terms “Moderna,” “the Company,” “we,” “us,” and “our” in this Form 10-Q refer to Moderna, Inc. and its consolidated subsidiaries.

ADDITIONAL INFORMATION

Our website, www.modernatx.com, including the Investor Relations section, www.investors.modernatx.com; and corporate blog www.modernatx.com/moderna-blog; as well as our social media channels: Facebook, www.facebook.com/modernatx; Twitter, www.twitter.com/modernatx; and LinkedIn, www.linkedin.com/company/modernatx; contain a significant amount of information about us, including financial and other information for investors. We encourage investors to visit these websites and social media channels as information is frequently updated and new information is shared. Information contained on our website and social media channels shall not be deemed incorporated into, or be a part of, this Form 10-Q.

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Item 1. Financial Statements

MODERNA, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited, in millions, except per share data)

	March 31, 2022	December 31, 2021
Assets		
Current assets:		
Cash and cash equivalents	$ 5,048	$ 6,848
Investments	5,067	3,879
Accounts receivable	3,173	3,175
Inventory	1,942	1,441
Prepaid expenses and other current assets	1,120	728
Total current assets	16,350	16,071
Investments, non-current	9,171	6,843
Property and equipment, net	1,341	1,241
Right-of-use assets, operating leases	132	142
Restricted cash, non-current	12	12
Deferred tax assets	521	326
Other non-current assets	82	34
Total assets	$ 27,609	$ 24,669
Liabilities and Stockholders' Equity		
Current liabilities:		
Accounts payable	$ 199	$ 302
Accrued liabilities	1,608	1,472
Deferred revenue	5,599	6,253
Income taxes payable	1,592	876
Other current liabilities	240	225
Total current liabilities	9,238	9,128
Deferred revenue, non-current	464	615
Operating lease liabilities, non-current	95	106
Financing lease liabilities, non-current	646	599
Other non-current liabilities	91	76
Total liabilities	10,534	10,524
Commitments and contingencies (Note 12)		
Stockholders' equity:		
Preferred stock, par value $0.0001; 162 shares authorized as of March 31, 2022 and December 31, 2021; no shares issued or outstanding at March 31, 2022 and December 31, 2021	—	—
Common stock, par value $0.0001; 1,600 shares authorized as of March 31, 2022 and December 31, 2021; 400 and 403 shares issued and outstanding as of March 31, 2022 and December 31, 2021, respectively	—	—
Additional paid-in capital	3,644	4,211
Accumulated other comprehensive loss	(184)	(24)
Retained earnings	13,615	9,958
Total stockholders' equity	17,075	14,145
Total liabilities and stockholders' equity	$ 27,609	$ 24,669

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

MODERNA, INC.
CONDENSED CONSOLIDATED STATEMENTS OF INCOME
(Unaudited, in millions, except per share data)

	Three Months Ended March 31,	
	2022	2021
Revenue:		
Product sales	$ 5,925	$ 1,733
Grant revenue	126	194
Collaboration revenue	15	10
Total revenue	6,066	1,937
Operating expenses:		
Cost of sales	1,017	193
Research and development	554	401
Selling, general and administrative	268	77
Total operating expenses	1,839	671
Income from operations	4,227	1,266
Interest income	15	4
Other expense, net	(13)	(10)
Income before income taxes	4,229	1,260
Provision for income taxes	572	39
Net income	$ 3,657	$ 1,221
Earnings per share:		
Basic	$ 9.09	$ 3.05
Diluted	$ 8.58	$ 2.84
Weighted average common shares used in calculation of earnings per share:		
Basic	402	400
Diluted	426	430

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

MODERNA, INC.
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Unaudited, in millions)

	Three Months Ended March 31,	
	2022	2021
Net income	$ 3,657	$ 1,221
Other comprehensive loss, net of tax:		
Available-for-sales securities:		
Unrealized losses on available-for-sale debt securities	(178)	(2)
Less: net realized losses on available-for-sale securities reclassified in net income	7	—
Net decrease from available-for-sale debt securities	(171)	(2)
Cash flow hedges:		
Unrealized gains on derivative instruments	25	—
Less: net realized (gains) on derivative instruments reclassified in net income	(14)	—
Net increase from derivatives designated as hedging instruments	11	—
Total other comprehensive loss	(160)	(2)
Comprehensive income	$ 3,497	$ 1,219

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

MODERNA, INC.
CONDENSED CONSOLIDATED STATEMENTS OF STOCKHOLDERS' EQUITY
(Unaudited, in millions)

	Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Loss	Retained Earnings	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2021	403	$ —	$ 4,211	$ (24)	$ 9,958	$ 14,145
Exercise of options to purchase common stock	1	—	12	—	—	12
Stock-based compensation	—	—	44	—	—	44
Other comprehensive loss, net of tax	—	—	—	(160)	—	(160)
Repurchase of common stock	(4)	—	(623)	—	—	(623)
Net income	—	—	—	—	3,657	3,657
Balance at March 31, 2022	400	$ —	$ 3,644	$ (184)	$ 13,615	$ 17,075

	Common Stock		Additional Paid-In Capital	Accumulated Other Comprehensive Income	Accumulated Deficit	Total Stockholders' Equity
	Shares	Amount				
Balance at December 31, 2020	399	$ —	$ 4,802	$ 3	$ (2,244)	$ 2,561
Exercise of options to purchase common stock	2	—	28	—	—	28
Stock-based compensation	—	—	30	—	—	30
Other comprehensive loss, net of tax	—	—	—	(2)	—	(2)
Net income	—	—	—	—	1,221	1,221
Balance at March 31, 2021	401	$ —	$ 4,860	$ 1	$ (1,023)	$ 3,838

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

MODERNA, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited, in millions)

	Three Months Ended March 31,	
	2022	**2021**
Operating activities		
Net income	$ 3,657	$ 1,221
Adjustments to reconcile net income to net cash provided by operating activities:		
Stock-based compensation	44	30
Depreciation and amortization	79	15
Amortization/accretion of investments	18	5
Deferred income taxes	(146)	(50)
Changes in assets and liabilities:		
Accounts receivable	1	(1,819)
Prepaid expenses and other assets	(414)	(12)
Inventory	(501)	(448)
Right-of-use assets, operating leases	10	2
Accounts payable	(35)	(15)
Accrued liabilities	114	285
Deferred revenue	(805)	3,666
Income taxes payable	716	90
Operating lease liabilities	(10)	(2)
Other liabilities	35	3
Net cash provided by operating activities	2,763	2,971
Investing activities		
Purchases of marketable securities	(5,572)	(726)
Proceeds from maturities of marketable securities	441	339
Proceeds from sales of marketable securities	1,377	242
Purchases of property and equipment	(132)	(35)
Investment in convertible notes	(35)	—
Net cash used in investing activities	(3,921)	(180)
Financing activities		
Proceeds from issuance of common stock through equity plans	12	28
Repurchase of common stock	(623)	—
Changes in financing lease liabilities	(31)	(2)
Net cash (used in) provided by financing activities	(642)	26
Net (decrease) increase in cash, cash equivalents and restricted cash	(1,800)	2,817
Cash, cash equivalents and restricted cash, beginning of year	6,860	2,636
Cash, cash equivalents and restricted cash, end of period	$ 5,060	$ 5,453
Non-cash investing and financing activities		
Purchases of property and equipment included in accounts payable and accrued liabilities	$ 64	$ 21
Right-of-use assets obtained through finance lease modifications and reassessments	$ —	$ 51
Right-of-use assets obtained in exchange for financing lease liabilities	$ 94	$ —

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

MODERNA, INC.
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

1. Description of the Business

Moderna, Inc. (collectively, with its consolidated subsidiaries, any of Moderna, we, us, our, or the Company) is a biotechnology company pioneering messenger RNA (mRNA) therapeutics and vaccines to create a new generation of transformative medicines to improve the lives of patients. Our platform builds on continuous advances in basic and applied mRNA science, delivery technology, and manufacturing, providing us the capability to pursue in parallel a robust pipeline of new development candidates. We are developing therapeutics and vaccines for infectious diseases, immuno-oncology, rare diseases, autoimmune and cardiovascular diseases, independently and with our strategic collaborators.

On December 18, 2020, we received an Emergency Use Authorization (EUA) from the U.S. Food and Drug Administration (FDA) for the emergency use of the Moderna COVID-19 Vaccine (also referred to as mRNA-1273 and marketed under the brand name Spikevax®) at the 100 µg dose level in individuals 18 years of age or older. Subsequently, we have also received authorization for our COVID-19 vaccine from health agencies in more than 70 countries and from the World Health Organization. In addition, we have received authorization for a two-dose 100 µg primary series of our COVID-19 vaccine in adolescents aged 12-17 years in more than 40 countries. We have received authorization for a two-dose 50 µg primary series of our COVID-19 vaccine in children ages 6 to 11 in more than 35 countries. The FDA, European Medicines Agency (EMA), Swissmedic and other health agencies around the world have authorized a booster dose of our COVID-19 vaccine at the 50 µg dose level for adults ages 18 years and older.

In January 2022, we received full commercial approval for Spikevax to prevent COVID-19 in individuals 18 years of age and older in the United States. Spikevax also has full commercial approval in individuals 18 years of age and older in Canada and the United Kingdom. In April 2022, we submitted a request for an EUA for a two-dose 25 µg primary series of our COVID-19 vaccine in children 6 months to 6 years of age to the FDA. Similar requests for pediatric authorizations are underway with international regulatory authorities.

2. Summary of Basis of Presentation and Recent Accounting Standards

Basis of Presentation and Principles of Consolidation

The accompanying unaudited condensed consolidated financial statements that accompany these notes have been prepared in accordance with U.S. generally accepted accounting principles (GAAP) and applicable rules and regulations of the Securities and Exchange Commission (SEC) for interim financial reporting, consistent in all material respects with those applied in our Annual Report on Form 10-K for the year ended December 31, 2021 (2021 Form 10-K). Any reference in these notes to applicable guidance is meant to refer to the authoritative accounting principles generally accepted in the United States as found in the Accounting Standard Codification (ASC) and Accounting Standards Update (ASU) of the Financial Accounting Standards Board (FASB). This report should be read in conjunction with the audited consolidated financial statements in our 2021 Form 10-K.

The condensed consolidated financial statements include Moderna, Inc. and its subsidiaries. All intercompany transactions and balances have been eliminated in consolidation. The significant accounting policies used in preparation of these condensed consolidated financial statements for the three months ended March 31, 2022 are consistent with those described in our 2021 Form 10-K. The results of operations for the three months ended March 31, 2022 are not necessarily indicative of the operating results to be expected for the full fiscal year or future operating periods.

Use of Estimates

We have made estimates and judgments affecting the amounts reported in our condensed consolidated financial statements and the accompanying notes. We base our estimates on historical experience and various relevant assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting periods that are not readily apparent from other sources. Significant estimates relied upon in preparing these financial statements include, but are not limited to, critical accounting policies or estimates related to revenue recognition, income taxes, valuation allowance on deferred tax assets, leases, fair value of financial instruments, derivative financial instruments, inventory, firm purchase commitment liabilities,

useful lives of property and equipment, research and development expenses, and stock-based compensation. The actual results that we experience may differ materially from our estimates.

Comprehensive Income

Comprehensive income includes net income and other comprehensive loss for the period. Other comprehensive loss consists of unrealized gains/losses and gains/losses on our investments and derivatives designated as hedging instruments. Total comprehensive income for all periods presented has been disclosed in the condensed consolidated statements of comprehensive income.

The components of accumulated other comprehensive loss for the three months ended March 31, 2022 were as follows (in millions):

	Unrealized Loss on Available-for-Sale Debt Securities	Net Unrealized Gains on Derivatives Designated As Hedging Instruments	Total
Accumulated other comprehensive loss, balance at December 31, 2021	$ (40)	$ 16	$ (24)
Other comprehensive loss	(171)	11	(160)
Accumulated other comprehensive loss, balance at March 31, 2022	$ (211)	$ 27	$ (184)

Restricted Cash

We include our restricted cash balance in the cash, cash equivalents and restricted cash reconciliation of operating, investing and financing activities in the condensed consolidated statements of cash flows.

The following table provides a reconciliation of cash, cash equivalents and restricted cash in the condensed consolidated balance sheets that sum to the total of the same such amounts shown in the condensed consolidated statements of cash flows (in millions):

	March 31,	
	2022	2021
Cash and cash equivalents	$ 5,048	$ 5,442
Restricted cash, non-current	12	11
Total cash, cash equivalents and restricted cash shown in the condensed consolidated statements of cash flows	$ 5,060	$ 5,453

Recently Issued Accounting Standards Not Yet Adopted

From time to time, new accounting pronouncements are issued by the FASB or other standard setting bodies and adopted by us as of the specified effective date. Unless otherwise discussed, we believe that the impact of recently issued standards that are not yet effective will not have a material impact on our condensed consolidated financial statements and disclosures.

3. Product Sales

Product sales are primarily associated with our COVID-19 vaccine supply agreements with the U.S. Government, other international governments and Gavi (on behalf of the COVAX Facility).

Product sales by customer geographic location were as follows (in millions):

	Three Months Ended March 31,	
	2022	2021
United States	$ 945	$ 1,358
Europe	2,076	284
Rest of world [1]	2,904	91
Total	$ 5,925	$ 1,733

[1] Includes product sales recognized under the agreement with Gavi, which facilitates the allocation and distribution of our COVID-19 vaccine around the world, particularly for low- and middle-income countries.

As of March 31, 2022, our COVID-19 vaccine (marketed under the brand name Spikevax) was our only commercial product authorized for use.

As of March 31, 2022 and December 31, 2021, we had deferred revenue of $5.9 billion and $6.7 billion, respectively, related to customer deposits. We expect $5.5 billion of our deferred revenue related to customer deposits as of March 31, 2022 to be realized in less than one year. Timing of product manufacturing, delivery, and receipt of marketing approval will determine the period in which revenue is recognized.

4. Grant Revenue

In September 2020, we entered into an agreement with the Defense Advanced Research Projects Agency (DARPA) for an award of up to $56 million to fund development of a mobile manufacturing prototype leveraging our existing manufacturing technology that is capable of rapidly producing therapeutics and vaccines. As of March 31, 2022, the committed funding, net of revenue earned was $7 million. An additional $33 million of funding will be available if DARPA exercises additional contract options.

In April 2020, we entered into an agreement with the Biomedical Advanced Research and Development Authority (BARDA), a division of the Office of the Assistant Secretary for Preparedness and Response within the U.S. Department of Health and Human Services (HHS), for an award of up to $483 million to accelerate development of mRNA-1273, our vaccine candidate against COVID-19. The agreement was amended in both 2020 and 2021 to provide for additional commitments to support various late-stage clinical development efforts of mRNA-1273, including a 30,000 participant Phase 3 study, pediatric clinical trials and pharmacovigilance studies. In March 2022, we entered into a further amendment to the BARDA agreement, increasing the amount of potential reimbursements by $308 million, in connection with costs associated with the clinical development for the adolescent and pediatric studies and the Phase 3 pivotal study. The maximum award from BARDA, inclusive of the 2020, 2021 and 2022 amendments, was approximately $1.7 billion. All contract options have been exercised. As of March 31, 2022, the remaining available funding, net of revenue earned was $378 million.

In September 2016, we received from BARDA an award of up to $126 million, subsequently adjusted to $117 million in 2021, to help fund our Zika vaccine program. Three of the four contract options have been exercised. As of March 31, 2022, the remaining available funding, net of revenue earned was $46 million, with an additional $8 million available if the final contract option is exercised.

In January 2016, we entered a global health project framework agreement with the Bill and Melinda Gates Foundation (Gates Foundation) to advance mRNA-based development projects for various infectious diseases, including human immunodeficiency virus (HIV). As of March 31, 2022, the available funding, net of revenue earned was $7 million, with up to an additional $80 million available if additional follow-on projects are approved.

The following table summarizes grant revenue for the periods presented (in millions):

	Three Months Ended March 31,	
	2022	2021
BARDA	$ 122	$ 192
Other grant revenue	4	2
Total grant revenue	$ 126	$ 194

5. Collaboration Agreements

We have entered into collaboration agreements with strategic collaborators to accelerate the discovery and advancement of potential mRNA medicines across therapeutic areas. As of March 31, 2022 and December 31, 2021, we had collaboration agreements with AstraZeneca plc (AstraZeneca), Merck & Co., Inc (Merck), Vertex Pharmaceuticals Incorporated and Vertex Pharmaceuticals (Europe) Limited (together, Vertex), and others. Please refer to our 2021 Form 10-K under the heading "Third-Party Strategic Alliances" and Note 5 to our consolidated financial statements for further description of these collaboration agreements.

The following table summarizes our total consolidated revenue from our strategic collaborators for the periods presented (in millions):

	Three Months Ended March 31,	
Collaboration Revenue by Strategic Collaborator:	**2022**	**2021**
Merck	$ 10	$ —
Vertex	4	9
Other	1	1
Total collaboration revenue	$ 15	$ 10

The following table presents changes in the balances of our receivables and contract liabilities related to our strategic collaboration agreements during the three months ended March 31, 2022 (in millions):

	December 31, 2021	**Additions**	**Deductions**	**March 31, 2022**
Contract Assets:				
Accounts receivable	$ 9	$ 3	$ (9)	$ 3
Contract Liabilities:				
Deferred revenue	$ 204	$ 3	$ (15)	$ 192

As of March 31, 2022, the aggregated amount of the transaction price allocated to performance obligations under our collaboration agreements that are unsatisfied or partially unsatisfied was $268 million.

In addition to the collaboration agreements mentioned above, we have other collaborative and licensing arrangements that we do not consider to be individually significant to our business at this time. Pursuant to these agreements, we may be required to make upfront payments and payments upon achievement of various development, regulatory and commercial milestones, which in the aggregate could be significant. Future milestone payments, if any, will be reflected in our consolidated financial statements when the corresponding events become probable. In addition, we may be required to pay significant royalties on future sales if products related to these arrangements are commercialized.

6. Financial Instruments

Cash and Cash Equivalents and Investments

The following tables summarize our cash and available-for-sale securities by significant investment category at March 31, 2022 and December 31, 2021 (in millions):

	March 31, 2022						
	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Cash and Cash Equivalents	Current Marketable Securities	Non-Current Marketable Securities
Cash and cash equivalents	$ 5,048	$ —	$ —	$ 5,048	$ 5,048	$ —	$ —
Available-for-sale:							
Certificates of deposit	251	—	—	251	—	251	—
U.S. treasury bills	515	—	(2)	513	—	513	—
U.S. treasury notes	7,956	—	(147)	7,809	—	2,820	4,989
Corporate debt securities	5,665	—	(117)	5,548	—	1,470	4,078
Government debt securities	122	—	(5)	117	—	13	104
Total	$ 19,557	$ —	$ (271)	$ 19,286	$ 5,048	$ 5,067	$ 9,171

	December 31, 2021						
	Amortized Cost	Unrealized Gains	Unrealized Losses	Estimated Fair Value	Cash and Cash Equivalents	Current Marketable Securities	Non-Current Marketable Securities
Cash and cash equivalents	$ 6,848	$ —	$ —	$ 6,848	$ 6,848	$ —	$ —
Available-for-sale:							
Certificates of deposit	80	—	—	80	—	80	—
U.S. treasury bills	479	—	—	479	—	479	—
U.S. treasury notes	6,595	—	(31)	6,564	—	1,984	4,580
Corporate debt securities	3,508	—	(20)	3,488	—	1,323	2,165
Government debt securities	112	—	(1)	111	—	13	98
Total	$ 17,622	$ —	$ (52)	$ 17,570	$ 6,848	$ 3,879	$ 6,843

The amortized cost and estimated fair value of available-for-sale securities by contractual maturity at March 31, 2022 and December 31, 2021 were as follows (in millions):

	March 31, 2022	
	Amortized Cost	Estimated Fair Value
Due in one year or less	$ 5,094	$ 5,067
Due after one year through five years	9,415	9,171
Total	$ 14,509	$ 14,238

	December 31, 2021	
	Amortized Cost	Estimated Fair Value
Due in one year or less	$ 3,882	$ 3,879
Due after one year through five years	6,892	6,843
Total	$ 10,774	$ 10,722

In accordance with our investment policy, we place investments in investment grade securities with high credit quality issuers, and generally limit the amount of credit exposure to any one issuer. We evaluate securities for impairment at the end of each reporting period. Impairment is evaluated considering numerous factors, and their relative significance varies depending on the situation.

Factors considered include whether a decline in fair value below the amortized cost basis is due to credit-related factors or non-credit-related factors, the financial condition and near-term prospects of the issuer, and our intent and ability to hold the investment to allow for an anticipated recovery in fair value. Any impairment that is not credit related is recognized in other comprehensive loss, net of applicable taxes. A credit-related impairment is recognized as an allowance on the balance sheet with a corresponding adjustment to earnings. We did not recognize any impairment charges related to available-for-sale securities for the three months ended March 31, 2022 and 2021. We did not record any credit-related allowance to available-for-sale securities as of March 31, 2022 and December 31, 2021.

The following table summarizes the amount of gross unrealized losses and the estimated fair value for our available-for-sale securities in an unrealized loss position by the length of time the securities have been in an unrealized loss position at March 31, 2022 and December 31, 2021 (in millions):

	Less than 12 Months		12 Months or More		Total	
	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value	Gross Unrealized Losses	Estimated Fair Value
As of March 31, 2022:						
U.S. treasury bills	$ (2)	$ 513	$ —	$ —	$ (2)	$ 513
U.S. treasury notes	(147)	7,722	—	—	(147)	7,722
Corporate debt securities	(117)	4,646	—	1	(117)	4,647
Government debt securities	(5)	116	—	—	(5)	116
Total	$ (271)	$ 12,997	$ —	$ 1	$ (271)	$ 12,998
As of December 31, 2021:						
U.S. treasury bills	$ —	$ 329	$ —	$ —	$ —	$ 329
U.S. treasury notes	(31)	6,332	—	—	(31)	6,332
Corporate debt securities	(20)	2,573	—	1	(20)	2,574
Government debt securities	(1)	112	—	—	(1)	112
Total	$ (52)	$ 9,346	$ —	$ 1	$ (52)	$ 9,347

At March 31, 2022 and December 31, 2021, we held 569 and 384 available-for-sale securities, respectively, out of our total investment portfolio that were in a continuous unrealized loss position. We neither intend to sell these investments, nor do we believe that we are more-likely-than-not to conclude we will have to sell them before recovery of their carrying values. We also believe that we will be able to collect both principal and interest amounts due to us at maturity.

Assets and Liabilities Measured at Fair Value on a Recurring Basis

The following fair value hierarchy is used to classify assets and liabilities based on the observable inputs and unobservable inputs used to value the assets and liabilities:

- Level 1: Unadjusted quoted prices in active markets that are accessible at the measurement date for identical, unrestricted assets or liabilities;
- Level 2: Quoted prices for similar assets and liabilities in active markets, quoted prices in markets that are not active, or inputs which are observable, either directly or indirectly, for substantially the full term of the asset or liability; or
- Level 3: Prices or valuation techniques that require inputs that are both significant to the fair value measurement and unobservable (i.e., supported by little or no market activity).

The following tables summarize our financial assets and liabilities measured at fair value on a recurring basis as of March 31, 2022 and December 31, 2021 (in millions):

	Fair value at March 31, 2022	Fair Value Measurement Using	
		Level 1	Level 2
Assets:			
Money market funds	$ 2,808	$ 2,808	$ —
Certificates of deposit	251	—	251
U.S. treasury bills	513	—	513
U.S. treasury notes	7,809	—	7,809
Corporate debt securities	5,548	—	5,548
Government debt securities	117	—	117
Derivative instruments (Note 7)	35	—	35
Total	$ 17,081	$ 2,808	$ 14,273
Liabilities:			
Derivative instruments (Note 7)	$ 9	$ —	$ 9

	Fair value at December 31, 2021	Fair Value Measurement Using	
		Level 1	Level 2
Assets:			
Money market funds	$ 2,329	$ 2,329	$ —
Certificates of deposit	80	—	80
U.S. treasury bills	479	—	479
U.S. treasury notes	6,564	—	6,564
Corporate debt securities	3,488	—	3,488
Government debt securities	111	—	111
Derivative instruments (Note 7)	21	—	21
Total	$ 13,072	$ 2,329	$ 10,743
Liabilities:			
Derivative instruments (Note 7)	$ 7	$ —	$ 7

As of March 31, 2022 and December 31, 2021, we did not have non-financial assets or liabilities measured at fair value on a recurring basis and did not have any Level 3 financial assets or financial liabilities.

In addition, as of March 31, 2022, we had $30 million in equity investments without readily determinable fair values, which are recorded within other non-current assets in our condensed consolidated balance sheets and excluded from the fair value measurement tables above. We did not have equity investments as of December 31, 2021.

7. Derivative Financial Instruments

We transact business in various foreign currencies and have international sales and expenses denominated in foreign currencies. Therefore, we are exposed to certain risks arising from both our business operations and economic conditions. Our risk management strategy includes the use of derivative financial instruments to hedge: (1) forecasted product sales that are denominated in foreign currencies and (2) foreign currency exchange rate fluctuations on monetary assets or liabilities denominated in foreign currencies. We do not enter into derivative financial contracts for speculative or trading purposes. We do not believe that we are exposed to more than a nominal amount of credit risk in our foreign currency hedges, as counterparties are large, global and well-capitalized financial institutions. We classify cash flows from our derivative transactions as cash flows from operating activities in our condensed consolidated statements of cash flows.

Cash Flow Hedges

We mitigate the foreign exchange risk arising from the fluctuations in foreign currency denominated product sales in Euro through a foreign currency cash flow hedging program, using forward contracts and foreign currency options that do not exceed 15 months in duration. We hedge these cash flow exposures to reduce the risk that our earnings and cash flows will be adversely affected by changes in exchange rates. To receive hedge accounting treatment, all hedging relationships are formally documented at the inception of the hedge, and the hedges must be highly effective in offsetting changes to future cash flows on hedged transactions. The derivative assets or liabilities associated with our hedging activities are recorded at fair value in other current assets or other current liabilities, respectively, in our condensed consolidated balance sheets. The gains or losses resulting from changes in the fair value of these hedges are initially recorded as a component of accumulated other comprehensive income (loss) (AOCI) in stockholders' equity and subsequently reclassified to product sales in the period during which the hedged transaction affects earnings. In the event the underlying forecasted transaction does not occur, or it becomes probable that it will not occur, within the defined hedge period, we reclassify the gains or losses on the related cash flow hedge from AOCI to other expense, net in our condensed consolidated statements of income. We evaluate hedge effectiveness at the inception of the hedge prospectively, and on an on-going basis both retrospectively and prospectively. If we do not elect hedge accounting, or the contract does not qualify for hedge accounting treatment, the changes in fair value from period to period are recorded as a component of other expense, net in our condensed consolidated statements of income. As of March 31, 2022, we had net deferred gains of $35 million on our foreign currency forward contracts included in AOCI that are expected to be recognized into product sales within the next 12 months.

Balance Sheet Hedges

We enter into foreign currency forward contracts to hedge fluctuations associated with foreign currency denominated monetary assets and liabilities, primarily accounts receivable, accounts payable and lease liabilities in Euro, Japanese Yen and Swiss Franc, that are not designated for hedge accounting treatment. Therefore, these forward contracts are accounted for as derivatives whereby the fair value of the contracts are reported as other current assets or other current liabilities in our condensed consolidated balance sheets, and gains and losses resulting from changes in the fair value are recorded as a component of other expense, net in our condensed consolidated statements of income. The gains and losses on these foreign currency forward contracts generally offset the gains and losses in the underlying foreign currency denominated assets and liabilities, which are also recorded to other expense, net, in our condensed consolidated statements of income.

Total gross notional amount and fair value of our foreign currency derivatives were as follows (in millions):

	March 31, 2022		
		Fair Value	
	Notional Amount	Asset [1]	Liability [2]
Derivatives designated as cash flow hedging instruments:			
Foreign currency forward contracts	$ 969	$ 35	$ —
Derivatives not designated as hedging instruments:			
Foreign currency forward contracts	627	—	9
Total derivatives	$ 1,596	$ 35	$ 9

	December 31, 2021		
		Fair Value	
	Notional Amount	Asset [1]	Liability [2]
Derivatives designated as cash flow hedging instruments:			
Foreign currency forward contracts	$ 565	$ 20	$ —
Derivatives not designated as hedging instruments:			
Foreign currency forward contracts	$ 1,370	$ 1	$ 7
Total derivatives	$ 1,935	$ 21	$ 7

[1] As presented in the condensed consolidated balance sheets within prepaid expenses and other current assets.
[2] As presented in the condensed consolidated balance sheets within other current liabilities.

Gains on our foreign currency derivatives, net of tax, recognized in our condensed consolidated statements of comprehensive income for the three months ended March 31, 2022 were as follows (in millions):

	Three Months Ended March 31, 2022
Derivatives in cash flow hedging relationships:	
Foreign currency forward contracts	$ 25

The effect of our foreign currency derivatives in our condensed consolidated statements of income for the three months ended March 31, 2022 and 2021 was as follows (in millions):

	Statement of Income Classification	Three Months Ended March 31, 2022	Three Months Ended March 31, 2021
Derivatives in cash flow hedging relationships:			
Foreign currency forward contracts			
Net gain reclassified from AOCI into income	Product sales	$ 14	$ —
Derivatives not designated as hedging instruments:			
Foreign currency forward contracts			
Net realized and unrealized gain	Other expense, net	$ 28	$ 35

There were no cash flow hedging activities for the three months ended March 31, 2021.

8. Inventory

Inventory as of March 31, 2022 and December 31, 2021 consisted of the following (in millions):

	March 31, 2022	December 31, 2021
Raw materials	$ 1,072	$ 870
Work in progress	513	338
Finished goods	357	233
Total inventory	$ 1,942	$ 1,441

Inventory is recorded at the lower of cost or net realizable value. On a quarterly basis, we evaluate the composition of inventory to identify excess, obsolete, slow-moving or otherwise unsaleable items. We also assess whether we have any excess firm, non-cancelable, purchase commitment liabilities, resulting from our supply agreements with third-party vendors on a quarterly basis. The determination of net realizable value of inventory and firm purchase commitment liabilities requires judgment, including consideration of many factors, such as estimates of future product demand, current and future market conditions, potential product obsolescence, expiration and utilization of raw materials under firm purchase commitments and contractual minimums, among others.

Inventory write-downs as a result of excess, obsolescence, scrap or other reasons, and losses on firm purchase commitments are recorded as a component of cost of sales in our condensed consolidated statements of income. For the three months ended March 31, 2022, inventory write-downs were $189 million and losses on firm purchase commitments, recorded as an accrued liability in our condensed consolidated balance sheets, were $159 million. Such charges were immaterial for the three months ended March 31, 2021.

9. Property and Equipment, Net

Property and equipment, net, as of March 31, 2022 and December 31, 2021 consisted of the following (in millions):

	March 31, 2022	December 31, 2021
Manufacturing and laboratory equipment	$ 179	$ 175
Leasehold improvements	353	313
Furniture, fixtures and other	16	11
Computer equipment and software	18	16
Internally developed software	8	9
Right-of-use asset, financing (Note 11)	951	857
Construction in progress	247	212
Total	1,772	1,593
Less: Accumulated depreciation	(431)	(352)
Property and equipment, net	$ 1,341	$ 1,241

Depreciation and amortization expense for the three months ended March 31, 2022 and 2021 was $79 million and $15 million, respectively.

10. Other Balance Sheet Components

Prepaid Expenses and Other Current Assets

Prepaid expenses and other current assets, as of March 31, 2022 and December 31, 2021 consisted of the following (in millions):

	March 31, 2022	December 31, 2021
Down payments for materials and supplies	$ 396	$ 287
Down payments to manufacturing vendors	234	118
Prepaid services	205	126
Value added tax receivable	104	70
Tenant improvement allowance receivable	51	51
Interest receivable	36	27
Derivative assets	35	21
Prepaid income tax	23	—
Other current assets	36	28
Prepaid expenses and other current assets	$ 1,120	$ 728

Accrued Liabilities

Accrued liabilities, as of March 31, 2022 and December 31, 2021 consisted of the following (in millions):

	March 31, 2022	December 31, 2021
Clinical trials	$ 288	$ 283
Raw materials	228	260
Royalties	207	241
Development operations	87	137
Manufacturing	275	227
Other external goods and services	174	79
Loss on future firm purchase commitments[(1)]	159	—
Compensation-related	74	126
Other	116	119
Accrued liabilities	$ 1,608	$ 1,472

[(1)] Related to losses that are expected to arise from firm, non-cancellable, commitments for future raw material purchases (Note 8).

Other Current Liabilities

Other current liabilities, as of March 31, 2022 and December 31, 2021 consisted of the following (in millions):

	March 31, 2022	December 31, 2021
Lease liabilities - financing (Note 11)	$ 160	$ 165
Lease liabilities - operating (Note 11)	46	46
Other	34	14
Other current liabilities	$ 240	$ 225

Deferred Revenue

The following table summarizes the activities in deferred revenue for the three months ended March 31, 2022 (in millions):

	December 31, 2021	Additions	Deductions	March 31, 2022
Product sales	$ 6,658	$ 1,755	$ (2,548)	$ 5,865
Grant revenue	6	—	—	6
Collaboration revenue	204	3	(15)	192
Total deferred revenue	$ 6,868	$ 1,758	$ (2,563)	$ 6,063

11. Leases

We have entered into various long-term non-cancelable lease arrangements for our facilities and equipment expiring at various times through 2042. Certain of these arrangements have free rent periods or escalating rent payment provisions. We recognize lease cost under such arrangements on a straight-line basis over the life of the leases. We have two campuses in Massachusetts, our Cambridge campus and our Moderna Technology Center (MTC), an industrial technology center located in Norwood. We also lease other office and lab spaces globally for our business operations.

Operating Leases

Cambridge Campus

We occupy a multi-building campus in Technology Square in Cambridge, Massachusetts with a mix of offices and research laboratory space totaling approximately 261,000 square feet. Our Cambridge campus leases have expiry ranges from 2024 to 2029.

In addition, we are investing in a new Moderna Science Center (MSC) in Cambridge, to create a purpose-built space to support our next chapter of discovery (see Note 12). In connection with our MSC investment, in September 2021, we entered into amendments to our lease agreements to allow for an option for early termination of the leases, either in part or full. Notification of the intent to exercise the option must be provided by August 2023. We have not elected to exercise this option.

Finance Leases

Moderna Technology Center

Our MTC comprises three main buildings: MTC South, MTC North and MTC East. Each of the MTC South and the MTC North is approximately 200,000 square feet and provides office, laboratory and light manufacturing space, directly supporting improvement in our manufacturing capabilities. The MTC East is approximately 240,000 square feet for expansion of our commercial and clinical activities. The MTC campus is leased through 2042 and we have the option to extend the term for three extension periods of five years.

Embedded Leases

We have entered into multiple contract manufacturing service agreements with third parties which contain embedded leases within the scope of ASC 842. These leases expire from 2022 through 2023. As of March 31, 2022 and December 31, 2021, we had lease liabilities of $173 million and $166 million, respectively, related to the embedded leases. As of March 31, 2022 and December 31, 2021, we had right-of-use assets of $171 million and $173 million, respectively.

Operating and financing lease right-of-use assets and lease liabilities as of March 31, 2022 and December 31, 2021 were as follows (in millions):

	March 31, 2022	December 31, 2021
Assets:		
Right-of-use assets, operating, net [1] [2]	$ 132	$ 142
Right-of-use assets, financing, net [3] [4]	693	665
Total	$ 825	$ 807
Liabilities:		
Current:		
Operating lease liabilities [5]	$ 46	$ 46
Financing lease liabilities [5]	160	165
Total current lease liabilities	206	211
Non-current:		
Operating lease liabilities, non-current	95	106
Financing lease liabilities, non-current	646	599
Total non-current lease liabilities	$ 741	$ 705
Total	$ 947	$ 916

[1] These assets are real estate related assets, which include land, office, and laboratory spaces.
[2] Net of accumulated amortization.
[3] These assets are real estate assets related to the MTC leases as well as assets related to contract manufacturing service agreements.
[4] Included in property and equipment in the condensed consolidated balance sheets, net of accumulated depreciation.
[5] Included in other current liabilities in the condensed consolidated balance sheets.

Future minimum lease payments under our non-cancelable lease agreements as of March 31, 2022, were as follows (in millions):

Fiscal Year	Operating Leases	Financing Leases [1]
2022 (remainder of the year)	$ 41	$ 169
2023	39	39
2024	15	21
2025	16	22
2026	16	22
Thereafter	51	1,111
Total minimum lease payments	178	1,384
Less amounts representing interest or imputed interest	(37)	(578)
Present value of lease liabilities	$ 141	$ 806

[1] Includes certain optional lease term extensions, predominantly related to the MTC leases, which represent a total of $662 million of undiscounted future lease payments.

12. Commitments and Contingencies

Legal Proceedings

We are involved in various claims and legal proceedings of a nature considered ordinary course in our business. The outcome of any such proceedings, regardless of the merits, is inherently uncertain; therefore, assessing the likelihood of loss and any estimated damages is difficult and subject to considerable judgment. We are not currently a party to any legal proceedings for which a material loss is probable, or for which a loss is reasonably estimable at this time.

Indemnification Obligations

As permitted under Delaware law, we indemnify our officers, directors, and employees for certain events, occurrences while the officer, or director is, or was, serving at our request in such capacity. The term of the indemnification is for the officer's or director's lifetime.

We have standard indemnification arrangements in our leases for laboratory and office space that require us to indemnify the landlord against any liability for injury, loss, accident, or damage from any claims, actions, proceedings, or costs resulting from certain acts, breaches, violations, or non-performance under our leases.

We enter into indemnification provisions under our agreements with counterparties in the ordinary course of business, typically with business partners, contractors, clinical sites and customers. Under these provisions, we generally indemnify and hold harmless the indemnified party for losses suffered or incurred by the indemnified party as a result of our activities. These indemnification provisions generally survive termination of the underlying agreement. The maximum potential amount of future payments we could be required to make under these indemnification provisions is unlimited.

Through the three months ended March 31, 2022 and the year ended December 31, 2021, we had not experienced any material losses related to these indemnification obligations, and no material claims were outstanding. We do not expect significant claims related to these indemnification obligations and, consequently, concluded that the fair value of these obligations is negligible, and no related reserves were established.

Purchase Commitments and Purchase Orders

We enter into agreements in the normal course of business with vendors and contract manufacturing organizations (CMOs) for raw materials and manufacturing services and with vendors for preclinical research studies, clinical trials and other goods or services. As of March 31, 2022, we had $2.5 billion of non-cancelable purchase commitments related to raw materials and manufacturing agreements, which are expected to be paid through 2025. As of March 31, 2022, we had $190 million of non-cancelable purchase commitments related to clinical services and other goods and services which are expected to be paid through 2026. These amounts represent our minimum contractual obligations, including termination fees.

In addition to purchase commitments, we have agreements with third parties for various goods and services, including services related to clinical operations and support and contract manufacturing, for which we are not contractually able to terminate for convenience and avoid any and all future obligations to the vendors. Certain agreements provide for termination rights subject to termination fees or wind down costs. Under such agreements, we are contractually obligated to make certain payments to vendors, mainly, to reimburse them for their unrecoverable outlays incurred prior to cancellation. At March 31, 2022, we had cancelable open purchase orders of $3.4 billion in total under such agreements for our significant clinical operations and support and contract manufacturing. These amounts represent only our estimate of those items for which we had a contractual commitment to pay at March 31, 2022, assuming we would not cancel these agreements. The actual amounts we pay in the future to the vendors under such agreements may differ from the purchase order amounts.

Licenses to Patented Technology

On June 26, 2017, we entered into sublicense agreements with Cellscript, LLC and its affiliate, mRNA RiboTherapeutics, Inc. to sublicense certain patent rights. Pursuant to each agreement, we are required to pay certain license fees, annual maintenance fees, minimum royalties on future net sales and milestone payments contingent on achievement of certain development, regulatory and commercial milestones for specified products, on a product-by-product basis. Commercial milestone payments and royalties based on annual net sales of licensed products for therapeutic and prophylactic products are accounted for as additional expense of the related product sales in the period in which the corresponding sales occur. For the three months ended March 31, 2022 and 2021, we recognized $207 million and $84 million, respectively, of royalty expenses associated with our product sales, which was recorded to cost of sales in our condensed consolidated statements of income.

Additionally, we have other in-license agreements with third parties which require us to make future development, regulatory and commercial milestone payments for specified products associated with the agreements. The achievement of these milestones was not deemed probable as of March 31, 2022.

Moderna Science Center

In September 2021, we announced an investment in the MSC, in Cambridge, Massachusetts. The MSC is expected to integrate scientific and non-scientific spaces, including our principal executive offices, and will be built to support our growth as we continue to advance our pipeline of mRNA medicines. In relation to the investment, we entered into a lease agreement for approximately 462,000 square feet and will undergo an approximately two-year building project. Following the building project, the lease term is 15 years, subject to our right to extend the lease for up to two additional seven-year terms. Pursuant to this lease agreement, we are committed to approximately $1.1 billion non-cancellable rent payments for the initial lease term. We expect to begin a phased move-in process in 2023.

13. Stock-Based Compensation and Share Repurchase Program

Stock-Based Compensation

The following table presents the components and classification of stock-based compensation expense for the three months ended March 31, 2022 and 2021 as follows (in millions):

	Three Months Ended March 31,	
	2022	2021
Options	$ 25	$ 22
Restricted Common Stock (RSUs) and Performance Stock Units (PSUs)	17	7
Employee Stock Purchase Plan (ESPP)	2	1
Total	$ 44	$ 30
Cost of sales	$ 8	$ 4
Research and development	20	14
Selling, general and administrative	16	12
Total	$ 44	$ 30

As of March 31, 2022, there was $538 million of total unrecognized compensation cost related to unvested stock-based compensation with respect to options, RSUs and PSUs granted. That cost is expected to be recognized over a weighted-average period of 3.2 years at March 31, 2022.

Share Repurchase Programs

On August 2, 2021, our Board of Directors authorized a Share Repurchase Program (2021 Repurchase Program) of our common stock. Pursuant to the 2021 Repurchase Program, we were authorized to repurchase up to $1.0 billion of our outstanding common stock, with an expiration date no later than August 2, 2023. By the end of January 2022, we had repurchased the entire $1.0 billion of common stock that was authorized under the 2021 Repurchase Program.

On February 22, 2022, our Board of Directors authorized a new Share Repurchase Program (2022 Repurchase Program) of our common stock, with no expiration date. Pursuant to the 2022 Repurchase Program, we may repurchase up to $3.0 billion of our outstanding common stock. The timing and actual number of shares repurchased will depend on a variety of factors, including price, general business and market conditions, and other investment opportunities, and shares may be repurchased through open market purchases through the use of trading plans intended to qualify under Rule 10b5-1 under the Securities Exchange Act of 1934, as amended.

During the three months ended March 31, 2022, we repurchased 4 million shares of our common stock under the 2021 Repurchase Program and the 2022 Repurchase Program for an aggregate of $623 million, including commissions and fees. As of March 31, 2022, there was a total of $2.5 billion remaining for repurchases of our common stock under the 2022 Repurchase Program.

14. Income Taxes

The following table summarizes our income tax expense (in millions, except for percentages):

	Three Months Ended March 31,	
	2022	2021
Income before income taxes	$ 4,229	$ 1,260
Provision for income taxes	$ 572	$ 39
Effective tax rate	13.5 %	3.1 %

Our effective tax rate for the three months ended March 31, 2022 was lower than the U.S. statutory rate, primarily due to the benefit of the foreign derived intangible income deduction and a discrete item for excess tax benefits related to stock-based compensation. The increase in our effective tax rate for the three months ended March 31, 2022 compared to the effective tax rate for the same period in 2021 is mainly attributable to the benefit recorded in 2021 related to the release of the valuation allowance on the majority of our deferred tax assets.

We file U.S. federal income tax returns and income tax returns in various state, local and foreign jurisdictions. We are not currently subject to any tax assessment from an income tax examination in the United States or any other major taxing jurisdiction.

Effective January 1, 2022, research and development expenses are required to be capitalized and amortized for U.S. tax purposes. Unless modified or repealed, and based on current assumptions, the mandatory capitalization would increase our cash tax liabilities, but also increase our foreign-derived intangible income deduction resulting in a decrease to our effective tax rate.

15. Earnings per Share

The computation of basic earnings per share (EPS) is based on the weighted-average number of our common shares outstanding. The computation of diluted EPS is based on the weighted-average number of our common shares outstanding and potential dilutive common shares during the period as determined by using the treasury stock method.

Basic and diluted EPS for the three months ended March 31, 2022 and 2021 were calculated as follows (in millions, except per share data):

	Three Months Ended March 31,	
	2022	2021
Numerator:		
Net income	$ 3,657	$ 1,221
Denominator:		
Basic weighted-average common shares outstanding	402	400
Effect of dilutive securities	24	30
Diluted weighted-average common shares outstanding	426	430
Basic EPS	$ 9.09	$ 3.05
Diluted EPS	$ 8.58	$ 2.84

The following common stock equivalents, presented based on amounts outstanding as of March 31, 2022 and 2021, were excluded from the calculation of diluted net income per share attributable to common stockholders for the periods presented because their inclusion would have been anti-dilutive (in millions):

	Three Months Ended March 31,	
	2022	2021
Stock options	2	1

Item 2. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our unaudited financial information and related notes included in this Form 10-Q and our consolidated financial statements and related notes and other financial information in our Annual Report on Form 10-K for the year ended December 31, 2021, which was filed with the Securities and Exchange Commission (the SEC) on February 25, 2022 (the 2021 Form 10-K). Some of the information contained in this discussion and analysis or set forth elsewhere in this Form 10-Q, including information with respect to our plans and strategy for our business, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in Part II, Item 1A - Risk Factors in this Form 10-Q, 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 a biotechnology company pioneering messenger RNA (mRNA) therapeutics and vaccines to create a new generation of transformative medicines to improve the lives of patients. Our platform builds on continuous advances in basic and applied mRNA science, delivery technology, and manufacturing, providing us the capability to pursue in parallel a robust pipeline of new development candidates. We are developing therapeutics and vaccines for infectious diseases, immuno-oncology, rare diseases, autoimmune diseases and cardiovascular diseases, independently and with our strategic collaborators. Within our platform, we develop technologies that enable the development of mRNA medicines for diverse applications. When we identify technologies that we believe could enable a new group of potential mRNA medicines with shared product features, we call that group a "modality." We have created seven modalities to date:

- prophylactic vaccines;
- systemic secreted and cell surface therapeutics;
- cancer vaccines;
- intratumoral immuno-oncology;
- localized regenerative therapeutics;
- systemic intracellular therapeutics; and
- inhaled pulmonary therapeutics.

On December 18, 2020, we received an Emergency Use Authorization (EUA) from the U.S. Food and Drug Administration (FDA) for the emergency use of the Moderna COVID-19 Vaccine (also referred to as mRNA-1273 and marketed under the brand name Spikevax) at the 100 µg dose level in individuals 18 years of age or older. Subsequently, we have also received authorization for our COVID-19 vaccine from health agencies in more than 70 countries and from the World Health Organization (WHO). In addition, we have received authorization for a two-dose 100 µg primary series of our COVID-19 vaccine in adolescents aged 12-17 years in more than 40 countries. We have received authorization for a two-dose 50 µg primary series of our COVID-19 vaccine in children ages 6 to 11 in more than 35 countries. The FDA, European Medicines Agency (EMA), Swissmedic and other health agencies around the world have authorized a booster dose of our COVID-19 vaccine at the 50 µg dose level for adults ages 18 years and older.

Business Highlights and Recent Development

Moderna COVID-19 Vaccine

- **Moderna COVID-19 Vaccine (mRNA-1273, Spikevax):** In January 2022, we received full commercial approval for Spikevax to prevent COVID-19 in individuals 18 years of age and older in the United States. Spikevax also has full commercial approval in individuals 18 years of age and older in Canada and the United Kingdom, and is approved or authorized in individuals 18 years and older in more than 70 countries (100 µg dose).

  In March 2022, we received approval from the FDA to amend our EUA to allow for a second booster dose of our COVID-19 vaccine at the 50 µg dose level in adults 50 years of age and older who have received an initial booster of any of the authorized or approved COVID-19 vaccines and adults 18 years of age and older with certain kinds of immunocompromise.

- For the first quarter of 2022, we recognized product sales of $5.9 billion from sales of our COVID-19 vaccine, compared to $1.7 billion in the first quarter of 2021.

- **Moderna COVID-19 Vaccine for adolescents and children:** In adolescents aged 12-17 years, the primary series (2 dose, 100 µg) of our COVID-19 vaccine is authorized in more than 40 countries. We made the decision to evaluate the potential of a two-dose 50 µg primary series to meet regulatory guidance for immunogenicity in adolescents. We are preparing to submit data for 50 µg COVID-19 boosters in this age group.

In children aged 6-11 years, the primary series (2 dose series, 50 µg) of our COVID-19 vaccine is authorized in more than 35 countries, including Australia, Canada and the EU. We are evaluating a 25 µg dose as a primary series and a booster dose in this age group.

In March 2022, we announced the Phase 2/3 KidCOVE study in children 6 months to under 6 years successfully met its primary endpoint. This interim analysis showed a robust neutralizing antibody response in both age groups after a two-dose 25 µg primary series of mRNA-1273 along with a favorable safety profile. Based on these data, in April 2022, we submitted an EUA request to the FDA for authorization of a two-dose 25 µg primary series of mRNA-1273 for children 6 months to under 6 years of age. Similar requests are underway with international regulatory authorities.

Additional Moderna COVID-19 Vaccine Clinical Studies

- **Omicron-specific booster candidate (mRNA-1273.529):** Our Omicron-specific booster candidate is being studied to evaluate the immunogenicity, safety and reactogenicity of mRNA-1273.529 as a single booster dose in adults aged 18 years and older in two cohorts: individuals who previously received the two-dose primary series of mRNA-1273 with the second dose being at least six months ago (cohort 1), or individuals who have received the two-dose primary series and a 50 µg booster dose of mRNA-1273 with the booster dose being at least three months ago (cohort 2). Participants in both cohorts will receive a single booster dose of mRNA-1273.529. In the U.S., a Phase 2 study of the Omicron-specific booster candidate (mRNA-1273.529) as a third or fourth dose is fully enrolled.

- **Beta-specific bivalent booster (mRNA-1273.211):** mRNA-1273.211 includes mutations found in the Beta variant of concern, several of which have been persistent in more recent variants of concern, including Omicron. A 50 µg booster dose of mRNA-1273.211 demonstrated superiority compared to a 50 µg booster dose of mRNA-1273 against Beta, Delta and Omicron variants of concern one month after administration. Superiority continued six months after administration for Beta and Omicron variants of concern as well. A 50 µg booster dose of mRNA-1273.211 was generally well tolerated with a reactogenicity profile comparable to a booster dose of mRNA-1273 at the 50 µg dose level.

- **Omicron-specific bivalent booster candidate (mRNA-1273.214):** mRNA-1273.214 is a bivalent candidate that combines Moderna's Omicron-specific candidate (mRNA-1273.529) and mRNA-1273. mRNA-1273.214 is being evaluated in a Phase 2/3 study, and the first participant was dosed in March 2022. We expect initial data on mRNA-1273.214 in June 2022 to inform selection of our candidate for the Northern Hemisphere fall 2022 booster.

  In the United Kingdom, enrollment is ongoing in a Phase 3 to evaluate Omicron-containing candidates as a third or fourth dose in individuals who received any primary series, including COVID-19 vaccinations from other manufacturers.

- **Next-generation vaccine candidate against COVID-19 (mRNA-1283):** mRNA-1283 is a next-generation vaccine candidate against COVID-19 and is being developed as a potential refrigerator-stable mRNA vaccine that will facilitate easier distribution and administration by healthcare providers. In a Phase 1 study of mRNA-1283, preliminary results indicate that when administered as primary series at lower dose levels (10 µg, 30 µg), mRNA-1283 elicits a robust anti-SARS-CoV-2 neutralizing antibody response comparable to the 100 µg mRNA-1273 primary series. The frequency of local and systemic solicited adverse reactions of the mRNA-1283 primary series administered at lower dose levels (10 µg, 30 µg) was overall comparable to mRNA-1273. Enrollment is complete in a Phase 2 study evaluating booster doses of mRNA-1283, mRNA-1283.211 (SARS-CoV-2/Beta bivalent), and mRNA-1283.529 (Omicron monovalent).

Other Business Updates

In March 2022, we announced an expansion of our mRNA pipeline with two new development programs. This announcement reflects our commitment to expanding our portfolio by building on our experience with our COVID-19 vaccine. The first development program is a new combination respiratory vaccine candidate (mRNA-1230) to target three of the most significant viruses causing respiratory disease in older adults—SARS-CoV-2, influenza and respiratory syncytial virus (RSV). The second is a program to develop a vaccine candidate (mRNA-1287) against endemic human coronaviruses (HCoVs). While less-well known than other coronaviruses, HCoVs are a significant cause of respiratory disease worldwide. Four HCoVs (HCoV-229E, -NL63, -OC43, and -HKU1) are endemic globally, accounting for approximately 10% to 30% of upper respiratory tract infections in adults.

In March 2022, we entered into a Memorandum of Understanding with the Government of the Republic of Kenya to establish Kenya as the location for our mRNA manufacturing facility, with the assistance of the U.S. Government. We expect to build a state-of-the-art mRNA facility in Kenya with the goal of producing up to 500 million doses of vaccines each year. We anticipate investing up to $500 million in this new facility which will focus on drug substance manufacturing on the continent of Africa for the continent of Africa,

and could also be expanded to include fill/finish and packaging capabilities at the site. In parallel, we are also working on plans to allow us to fill doses of our COVID-19 vaccine in Africa as early as 2023, subject to demand.

In March 2022, we executed a strategic partnership agreement with the Australian Federal Government to establish a state-of-the-art, mRNA vaccine manufacturing facility in Australia. The facility, when constructed, is expected to provide people in Australia with access to a domestically manufactured portfolio of mRNA vaccines against respiratory viruses, including COVID-19, seasonal influenza, RSV, and other potential respiratory viruses, pending licensure. As part of this strategic partnership, we expect to support Australia's mRNA research, development, and industry ecosystem, including engagement with collaborative research partnerships with Australian institutions and establishing a Regional Research Center for respiratory medicines and tropical diseases.

In April 2022, we announced plans for a long-term strategic collaboration with the Government of Canada to establish a state-of-the-art mRNA vaccine manufacturing facility in Canada. The collaboration is expected to be finalized following approval of the final agreement by the Government of Canada. The facility, when constructed, is expected to provide people in Canada with access to a domestically manufactured portfolio of mRNA vaccines against respiratory viruses, including COVID-19, seasonal influenza, RSV, and other potential respiratory viruses, pending licensure. As part of this strategic collaboration, we expect to support research and development and other commercial collaborations in Canada.

In March 2022, we announced our global public health strategy through three new initiatives aimed at advancing mRNA vaccines for the prevention of infectious diseases. First, we announced a commitment to advance vaccines targeting 15 priority pathogens into clinical studies by 2025. We expect to prioritize HIV, tuberculosis (TB), malaria, neglected tropical diseases, and priority pathogens of the WHO and the Coalition for Epidemic Preparedness Innovations (CEPI). Second, to accelerate research with the aim of advancing additional vaccines, we are launching a new program, *mRNA Access*, that will offer researchers use of our mRNA technology to explore new vaccines against emerging or neglected infectious disease. Third, we have expanded our pledge to never enforce our patents for COVID-19 vaccines against manufacturers in 92 low- and middle-income countries in the Gavi COVAX Advance Market Commitment (AMC), provided that these vaccines are manufactured solely for use in these countries. We remain willing to license our technology for COVID-19 vaccines to manufacturers in countries outside of the AMC 92 on commercially reasonable terms.

Key Updates for our Other Development Candidates

- **Seasonal influenza (flu) (mRNA-1010, mRNA-1011, mRNA-1012, mRNA-1020 and mRNA-1030):** As part of our influenza vaccine development strategy, we are developing five different influenza vaccines. mRNA-1010 is a single investigational vaccine consisting of four distinct mRNA sequences that encode the A H1N1, H3N2 and influenza B Yamagata and Victoria lineages in our proprietary LNP. mRNA-1011 and mRNA-1012 are investigational vaccines that will include the four WHO-recommended strains and aim to add additional hemagglutinin (HA) antigens (e.g. H3N2, H1N1). mRNA-1020 and mRNA-1030 are investigational vaccines that will aim to add neuraminidase (NA) antigens.

  In March 2022, an interim analysis of a Phase 2 study of mRNA-1010 identified no significant safety concerns, and the immunogenicity data is consistent with a potential for superiority to standard dose vaccine for influenza A strains (which drives the majority of disease in adults). The interim data is consistent with potential for non-inferiority to standard dose vaccine in influenza B strains (primarily a concern in pediatrics). We plan on starting a Phase 3 safety and immunogenicity study of mRNA-1010 in the Southern Hemisphere in in 2022, and are preparing for a Phase 3 efficacy study in fall 2022 if needed.

  In April, we announced that the Phase 1 trial of mRNA-1020 and mRNA-1030 dosed its first participants. The Phase 1/2 randomized, observer-blind, dose-ranging study will evaluate the safety, reactogenicity and immunogenicity of a single dose of mRNA-1020 or mRNA-1030 in healthy adults 18 years and older in the U.S. mRNA-1020 and mRNA-1030 candidates each include eight mRNAs, targeting both hemagglutinin and neuraminidase at different doses and ratios.

- **Respiratory syncytial virus (RSV) vaccine (mRNA-1345):** mRNA-1345 is a vaccine against RSV encoding for a prefusion F glycoprotein, which elicits a superior neutralizing antibody response compared to the postfusion state. The Phase 1 study of mRNA-1345 to evaluate the tolerability, reactogenicity and immunogenicity of mRNA-1345 in younger adults, older adults, women of child-bearing age, older adults of Japanese descent and children is ongoing. All cohorts are fully enrolled except the RSV seropositive children cohort, which is ongoing. Dosing in the older adults of Japanese descent (≥ 60 years) and children cohorts are ongoing. Phase 1 interim data from the older adult cohort showed that a single mRNA-1345 vaccination at 50 µg, 100 µg or 200 µg boosted neutralizing antibody titers against RSV-A by approximately 14-fold and against RSV-B by approximately 10-fold. The Phase 3 portion of the pivotal global Phase 2/3 study of mRNA-1345 with approximately 34,000 participants is currently enrolling. The FDA has granted Fast Track designation for mRNA-1345 in adults older than 60 years of age.

- **HIV vaccines (mRNA-1644 & mRNA-1574):** We are currently advancing two HIV preventative vaccine strategies based on germline targeting and immune-focusing approaches. Our mRNA-1644 program is designed to test the hypothesis that sequential administration of priming and boosting HIV immunogens delivered by mRNA can induce specific classes of B-cell responses and guide their early maturation toward broadly neutralizing antibody (bnAb) development. The induction of bnAbs is widely considered to be a goal of HIV vaccination, and this is the first step in that process. The immunogens being tested in IAVI G002 were developed by scientific teams at IAVI and Scripps Research and will be delivered via Moderna's mRNA technology. The Phase 1 trial sponsored by IAVI and supported by the Gates Foundation is ongoing. In addition, we are also advancing an HIV trimer mRNA vaccine trial of mRNA-1574. The primary hypothesis is that the soluble and membrane-bound HIV envelope trimer mRNA vaccines will be safe and well-tolerated by HIV-uninfected individuals and will elicit autologous neutralizing antibodies. The Phase 1 trial is ongoing and is sponsored and funded by the Division of AIDS (DAIDS) of the National Institute of Allergy and Infectious Diseases (NIAID) within the National Institutes of Health (NIH).

- **Nipah vaccine (mRNA-1215):** We received a safe to proceed from the FDA for a Phase 1 study of mRNA-1215, our vaccine candidate against the Nipah virus (NiV). mRNA-1215 was co-developed along with the NIH's Vaccine Research Center and the Phase 1 clinical testing will be focused on pandemic preparedness.

- **Propionic acidemia (PA) (mRNA-3927):** The Phase 1/2 clinical trial for mRNA-3927, our therapy for the treatment of propionic acidemia, or PA, is ongoing and the first cohort is fully enrolled. We are enrolling other patients into additional cohorts. All five patients eligible for the Open Label Extension (OLE) study have elected to participate. The Phase 1/2 study is designed to evaluate the safety and tolerability of mRNA-3927 in patients with PA. PA, is a rare, life-threatening, inherited metabolic disorder due to a defect in the mitochondrial enzyme propionyl-CoA carboxylase (PCC). It primarily affects the pediatric population. There is no approved therapy for PA, including no approved enzyme replacement therapy. We have received Rare Pediatric Disease Designation and Orphan Drug Designation from the FDA and Orphan Drug Designation from the European Commission for the PA program. The FDA has also granted Fast Track designation to mRNA-3927. This is the first development candidate to enter the clinic in our intracellular therapeutics modality.

- **Methylmalonic acidemia (MMA) (mRNA-3705):** The Phase 1/2 clinical trial for mRNA-3705, our therapy for the treatment of methylmalonic acidemia, or MMA, is ongoing and the first cohort has been fully enrolled. The study is now open in the UK, Canada and the U.S. Moderna is enrolling patients into additional cohorts. The one patient eligible to participate in the OLE study has elected to participate. The Phase 1/2 study is designed to evaluate the safety and tolerability of mRNA-3705 in patients with MMA. MMA is a rare, life-threatening, inherited metabolic disorder that is primarily caused by a defect in the mitochondrial enzyme methylmalonyl-coenzyme A mutase, or MUT. It primarily affects the pediatric population. There is no approved therapy that addresses the underlying disorder, including no approved enzyme replacement therapy, due to the complexity of the protein and its mitochondrial localization.

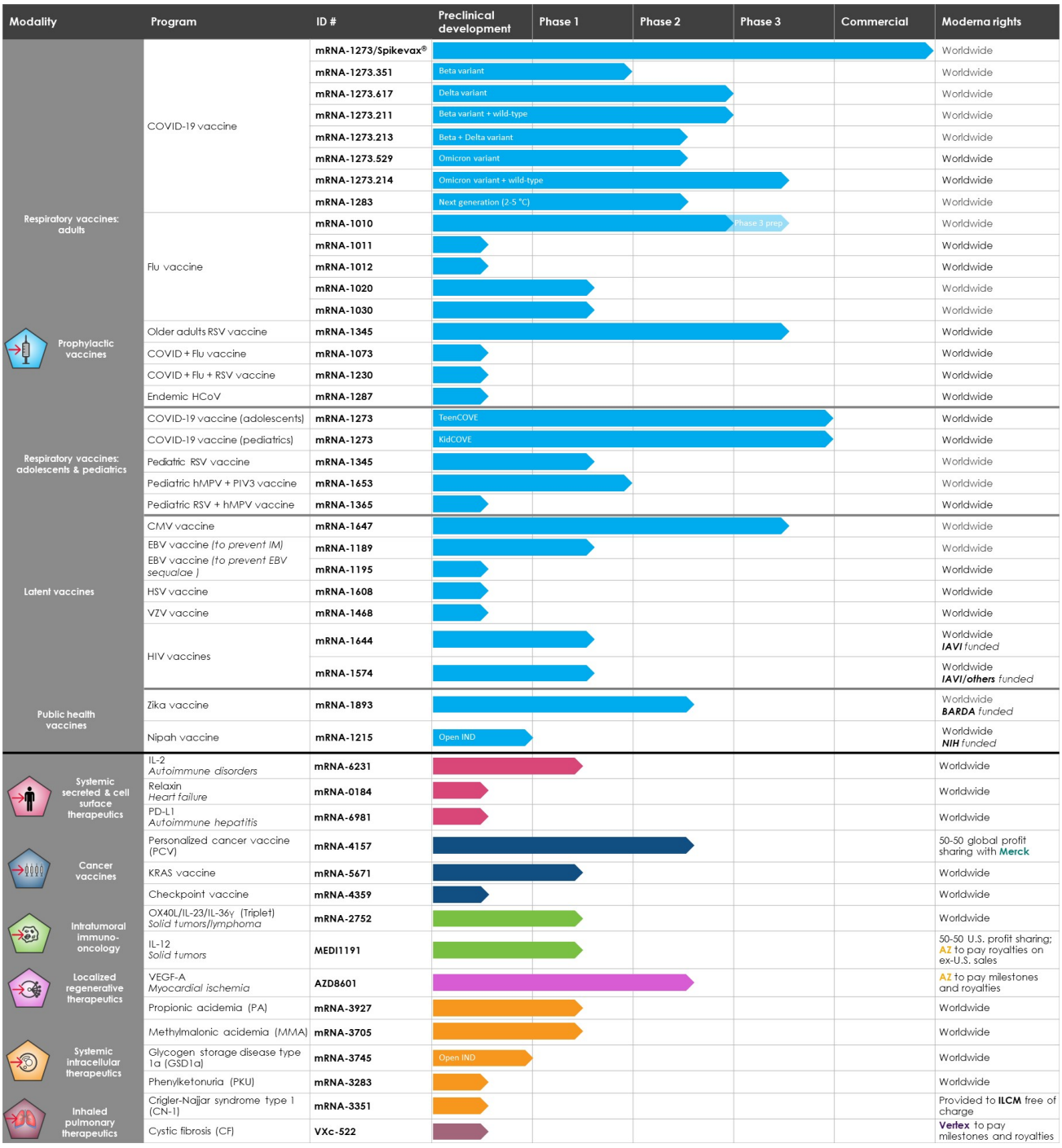
- **Glycogen storage disease type 1a (GSD1a) (mRNA-3745):** The FDA has granted mRNA-3745 Orphan Drug Designation and completed its review of the IND application allowing it to proceed to clinic. Individuals with GSD1a have a deficiency in glucose-6-phosphatase resulting in pathological blood glucose imbalance. mRNA-3745 is an IV-administered mRNA encoding human G6Pase enzyme, designed to restore the deficient or defective intracellular enzyme activity in patients with GSD1a.

- **IL-12 (MEDI1191):** AstraZeneca is leading the early clinical development and an ongoing, open-label multicenter Phase 1 clinical trial of intratumoral injections of MEDI1191 alone and in combination with the checkpoint inhibitor, durvalumab. In April 2022, AstraZeneca presented updated Phase 1 data at the American Association for Cancer Research (AACR) conference. Intratumoral MEDI1191 combined with durvalumab was safe and the combination showed preliminary evidence of clinical benefit, with 29% of patients exhibiting partial responses or stable disease ≥12 weeks as best overall response**.**

- **Personalized cancer vaccine (mRNA-4157):** Our personalized cancer vaccine, or PCV, is currently being evaluated in a Phase 1 and Phase 2 study. The randomized, placebo-controlled Phase 2 study investigating a 1 mg dose of mRNA-4157 in combination with Merck's pembrolizumab (KEYTRUDA®), compared to pembrolizumab alone, for the adjuvant treatment of high-risk resected melanoma is fully enrolled (n=150). The primary endpoint of the Phase 2 study is recurrence-free survival at 12 months. The Phase 1 in multiple cohorts is ongoing and the expanded head and neck cohort is recruiting additional patients. Moderna shares worldwide commercial rights to mRNA-4157 with Merck.

Our Pipeline

The following chart shows our current pipeline of 46 development programs, grouped by respiratory vaccines, latent & public health vaccines and therapeutics.



Abbreviations: AZ, AstraZeneca; BARDA, Biomedical Advanced Research and Development Authority; CMV, Cytomegalovirus; DARPA, Defense Advanced Research Projects Agency; EBV, Epstein-Barr virus; HIV, human immunodeficiency virus; hMPV, human metapneumovirus; ILCM, Institute for Life Changing Medicines; IL-2, interleukin 2; IL-12, interleukin 12; IL-23, interleukin 23; IL-36γ, interleukin-36 gamma; NIH, National Institutes of Health; OX40L, wildtype OX40 ligand; RSV, respiratory syncytial virus; VEGF-A, vascular endothelial growth factor A.

We have developed seven modalities, which are summarized as follows:

- **Prophylactic vaccines:** Our prophylactic vaccines modality currently includes 31 development programs, 21 of which have entered into clinical trials. We have ongoing Phase 1 trials for our RSV vaccine in pediatrics, flu vaccines (mRNA-1020 and mRNA-1030), hMPV/PIV3 vaccine (mRNA-1653), EBV vaccine (mRNA-1189) and HIV vaccines (mRNA-1644 and mRNA-1574). We have ongoing Phase 2 studies for our flu vaccine (mRNA-1010) and Zika vaccine (mRNA-1893). We have ongoing Phase 3 studies for our RSV vaccine in older adults (mRNA-1345) and CMV vaccine (mRNA-1647). Our COVID-19 vaccine (mRNA-1273) is described in detail above. Our ten preclinical programs within our prophylactic vaccines modality are for a combined COVID-19 and flu vaccine (mRNA-1073), combined COVID-19, flu and RSV vaccine (mRNA-1230), combined pediatric RSV and hMPV vaccine (mRNA-1365), pan-HCoV vaccine (mRNA-1278), seasonal flu vaccines (mRNA-1011 and mRNA-1012), EBV vaccine to prevent long-term sequelae (mRNA-1195), VZV vaccine (mRNA-1468), HSV vaccine (mRNA-1608) and Nipah vaccine (mRNA-1215). Three other vaccines as part of public health programs have had positive Phase 1 readouts – H10N8 vaccine (mRNA-1440), H7N9 flu vaccine (mRNA-1851), and Chikungunya vaccine (mRNA-1388) – but are not being further developed without government or other funding.

- **Systemic secreted and cell surface therapeutics:** We have three systemic secreted and cell surface therapeutics development candidates in our pipeline. Our secreted programs include Relaxin (mRNA-0184) for cardiac disorders, PD-L1 (mRNA-6981) for autoimmune hepatitis and IL-2 (mRNA-6231) for autoimmune disorders. Our IL-2 program (mRNA-6231) is currently in a Phase 1 study, and is our first autoimmune therapeutic candidate to enter the clinic. The remaining programs for Relaxin (mRNA-0184) and PD-L1 (mRNA-6981) are currently in preclinical development. We previously announced positive data from our Chikungunya Antibody program (mRNA-1944) within this modality; however, we do not expect to advance our Chikungunya Antibody program without outside funding, and we are not currently pursuing further development of it at this time.

- **Cancer vaccines:** We are currently developing three programs within our cancer vaccines modality. Our personalized cancer vaccine program mRNA-4157 is being developed in collaboration with Merck and is in a multiple-arm Phase 1 trial and a randomized Phase 2 trial, which is fully enrolled. Our second program within this modality, mRNA-5671, is a KRAS vaccine. We have retained all rights to our KRAS vaccine from Merck and we are evaluating next steps for the program. Our third program is our checkpoint vaccine (mRNA-4359), which is in preclinical studies.

- **Intratumoral immuno-oncology:** We have two programs in this modality. Our first program, OX40L/IL-23/IL-36γ (Triplet) (mRNA-2752), is currently in a Phase 1 study that is designed as an open-label, multicenter study of intratumoral injections of Triplet (mRNA-2752) alone or in combination with durvalumab (anti-PD-L1). Our second program, IL-12 (MEDI1191), is being developed in collaboration with AstraZeneca. AstraZeneca is currently enrolling an open-label multicenter Phase 1 clinical trial of intratumoral injections of MEDI1191 alone and in combination with the checkpoint inhibitor, durvalumab.

- **Localized regenerative therapeutics:** Our localized VEGF-A program, AZD8601, which is being developed by AstraZeneca, has completed a Phase 1a/b trial to describe its safety, tolerability, protein production, and activity in diabetic patients. The study has met its primary objectives of describing safety and tolerability and secondary objectives of demonstrating protein production and changes in blood flow post AZD8601 administration. We believe these data provide clinical proof of mechanism for our mRNA technology outside of the vaccine setting. In 2021, the Phase 2 study met the primary endpoint of safety and tolerability of AZD8601 for the 3 mg dose. In the study of 11 patients, seven were treated with AZD8601 VEGF-A mRNA and four received placebo injections. Numerical trends were observed in endpoints in the heart failure efficacy domains compared with placebo, including increase in left ventricular ejection fraction (LVEF) and patient reported outcomes. In addition, all seven patients treated with AZD8601 had NT-proBNP (a biomarker that measures the level of a hormone that is elevated in patients with heart failure) levels below heart failure limit at 6 months follow-up compared to one of four patients treated with placebo. AstraZeneca has announced that they intend to move AZD8601 into further studies. Moderna has licensed worldwide commercial rights to AZD8601 to AstraZeneca.

- **Systemic intracellular therapeutics:** We have five systemic intracellular therapeutics development candidates in our pipeline. Our intracellular programs address propionic acidemia, or PA (mRNA-3927), methylmalonic acidemia (MMA) (mRNA-3705), phenylketonuria (PKU) (mRNA-3283), glycogen storage disorder type 1a (GSD1a) (mRNA-3745) and Crigler-Najjar Syndrome Type 1 (CN-1) (mRNA-3351). We have an ongoing Phase 1 clinical trials for PA (mRNA-3927) and MMA (mRNA-3705). PKU (mRNA-3283), GSD1a (mRNA-3745) and CN-1 (mRNA-3351) are currently in preclinical development. The FDA has granted Orphan Drug Designation for mRNA-3745 and has completed its review of the IND application allowing it to proceed to clinic. We have entered into a collaboration agreement with the Institute for Life Changing Medicines (ILCM) to license mRNA-3351 to ILCM with no upfront fees, and without any downstream payments. ILCM will be responsible for the clinical development of mRNA-3351.

- **Inhaled pulmonary therapeutics:** We have one inhaled pulmonary therapeutic development candidate in our pipeline. Our program addresses cystic fibrosis, or CF (VXc-522), in collaboration partnership with Vertex Pharmaceuticals. VXc-522 is an mRNA therapeutic designed to treat the underlying cause of CF by enabling cells in the lungs to produce functional cystic fibrosis transmembrane conductance regulator (CFTR) protein for the treatment of the 10% of patients who do not produce any CFTR protein. IND-enabling studies are underway and Vertex expects to submit an IND for this program in 2022. Moderna has licensed worldwide commercial rights to VXc-522 to Vertex.

Financial Operations Overview

Revenue

The following table summarizes revenue for the periods presented (in millions):

	Three Months Ended March 31,	
	2022	2021
Revenue:		
Product sales	$ 5,925	$ 1,733
Grant revenue	126	194
Collaboration revenue	15	10
Total revenue	$ 6,066	$ 1,937

For the three months ended March 31, 2022, we recognized $5.9 billion of product sales from our COVID-19 vaccine, of which $0.9 billion was generated in the United States and $5.0 billion was generated from the rest of the world. For the three months ended March 31, 2021, we recognized $1.7 billion of product sales from our COVID-19 vaccine, of which $1.4 billion was generated in the United States and $375 million was generated from the rest of the world.

As of March 31, 2022, we had signed supply agreements of approximately $17.5 billion for the future supply of our COVID-19 vaccine through 2023, based on the confirmed volume, subject to modifications, and had deferred revenue of $5.9 billion associated with customer deposits received or billable under these agreements. In addition, we believe that the SARS-CoV-2 virus will become endemic in 2022 and as a result, we expect greater seasonality in our product sales, with sales slightly larger in the second half of 2022 than in the first half as the Northern Hemisphere enters the fall and winter in connection with booster sales.

Other than product sales, our revenue has been primarily derived from government-sponsored and private organizations including BARDA, DARPA and the Gates Foundation and from strategic alliances with AstraZeneca, Merck and Vertex to discover, develop, and commercialize potential mRNA medicines.

Grant revenue was comprised as follows for the periods presented (in millions):

	Three Months Ended March 31,	
	2022	2021
Grant revenue:		
BARDA [(1)]	$ 122	$ 192
Other	4	2
Total grant revenue	$ 126	$ 194

[(1)] For the three months ended March 31, 2022, $120 million of BARDA grant revenue was related to our mRNA-1273 program and $2 million was related to our Zika vaccine program. For the three months ended March 31, 2021, $190 million of BARDA grant revenue was related to our mRNA-1273 program and $2 million was related to our Zika vaccine program.

Collaboration revenue from our strategic alliances was comprised as follows for the periods presented (in millions):

	Three Months Ended March 31,	
	2022	2021
Collaboration revenue:		
Merck	10	—
Vertex	4	9
Other	1	1
Total collaboration revenue	$ 15	$ 10

We expect to continue to receive funding from our contract with BARDA. As of March 31, 2022, the remaining available funding, net of revenue earned under our agreement with BARDA for the development of our mRNA-1273 vaccine was $378 million. To the extent that existing or potential future products generate revenue, our revenue may vary due to many uncertainties in the future product demand, the development of our mRNA medicines and other factors.

Research and development expenses

We use our employee and infrastructure resources for the advancement of our platform, and for discovering and developing programs. Due to the number of ongoing programs and our ability to use resources across several projects, indirect or shared operating costs incurred for our research and development programs are generally not recorded or maintained on a program- or modality-specific basis. The following table reflects our research and development expenses, including direct program-specific expenses summarized by modality and indirect or shared operating costs summarized under other research and development expenses during the three months ended March 31, 2022 and 2021 (in millions):

	Three Months Ended March 31,	
	2022	2021
Program expenses by modality:		
Prophylactic vaccines	$ 190	$ 248
Systemic secreted and cell surface therapeutics	1	1
Cancer vaccines	3	17
Intratumoral immuno-oncology	6	6
Systemic intracellular therapeutics	4	5
Inhaled pulmonary therapeutics [1]	2	—
Total program-specific expenses by modality [2]	$ 206	$ 277
Other research and development expenses:		
Discovery programs	30	13
Platform research	34	25
Technical development and unallocated manufacturing expenses	134	33
Shared discovery and development expenses	130	39
Stock-based compensation	20	14
Total research and development expenses	$ 554	$ 401

(1) Inhaled pulmonary therapeutics modality was added in the fourth quarter of 2021.

(2) Includes a total of 43 and 30 development candidates at March 31, 2022 and 2021, respectively. Program-specific expenses include external costs and allocated manufacturing costs of pre-launch inventory, mRNA supply and consumables, and are reflected as of the beginning of the period in which the program was internally advanced to development or removed if development was ceased.

A *"modality"* refers to a group of programs with common product features and the associated combination of enabling mRNA technologies, delivery technologies, and manufacturing processes. The program-specific expenses by modality summarized in the table above include expenses we directly attribute to our programs, which consist primarily of external costs, such as fees paid to outside consultants, central laboratories, investigative sites, and contract research organizations (CROs) in connection with our preclinical studies and clinical trials, CMOs, and allocated manufacturing costs of pre-launch inventory, mRNA supply and consumables. Costs to acquire and manufacture pre-launch inventory, mRNA supply for preclinical studies and clinical trials are recognized and included in unallocated manufacturing expenses when incurred, and subsequently allocated to program-specific manufacturing costs after completion of the program-specific production. The timing of allocating manufacturing costs to the specific program varies depending on the program development and production schedule. We generally do not allocate personnel-related costs,

including stock-based compensation, costs associated with our general platform research, technical development, and other shared costs on a program-specific basis. These costs were therefore excluded from the summary of program-specific expenses by modality.

Discovery program expenses are costs associated with research activities for our programs in the preclinical discovery stage, and primarily consist of external costs for CROs and lab services, and allocated manufacturing cost of preclinical mRNA supply and consumables.

Platform research expenses are mainly costs to develop technical advances in mRNA science, delivery science, and manufacturing process design. These costs include personnel-related costs, computer equipment, facilities, preclinical mRNA supply and consumables, and other administrative costs to support our platform research. Technology development and unallocated manufacturing expenses are primarily related to non-program-specific manufacturing process development and manufacturing costs.

Shared discovery and development expenses are research and development costs such as personnel-related costs and other costs, which are not otherwise included in development programs, discovery programs, platform research, technical development and unallocated manufacturing expenses, stock-based compensation, and other expenses.

The largest component of our total operating expenses has historically been our investment in research and development activities, including preclinical and clinical development of our product candidates, development of our platform, mRNA technologies, and manufacturing technologies.

As we continue to pursue our indication expansion of mRNA-1273, and continue to develop variant-specific COVID-19 vaccine candidates and our next-generation COVID-19 vaccine candidate, we expect to continue to incur significant additional expenses. In connection with the BARDA agreement to accelerate development of mRNA-1273, significant grant revenue and expenses within the committed funding scope are expected to continue in 2022. BARDA's funding is expected to offset those expenses that are covered under the BARDA agreement, subject to our obtaining reimbursement from BARDA. As of March 31, 2022, the remaining available funding, net of revenue earned was $378 million.

Changes in expectations or outcomes of any of the known or unknown risks and uncertainties may materially impact our expected research and development expenditures. Continued research and development is central to the ongoing activities of our business. Investigational medicines in later stages of clinical development, such as our CMV vaccine, RSV vaccine, flu vaccine and our COVID-19 vaccine, generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect our research and development costs to continue to increase in the foreseeable future as our investigational medicines progress through the development phases and identify and develop additional programs. There are numerous factors associated with the successful commercialization of any of our investigational medicines, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time due to the early stage of development of our investigational medicines. Moreover, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

Critical accounting policies and significant judgments and estimates

There have been no material changes in our critical accounting policies and estimates in the preparation of our condensed consolidated financial statements during the three months ended March 31, 2022 compared to those disclosed in our 2021 Form 10-K.

Results of operations

The following table summarizes our condensed consolidated statements of income for each period presented (in millions):

	Three Months Ended March 31,		Change 2022 vs. 2021	
	2022	2021	$	%
Revenue:				
Product revenue	$ 5,925	$ 1,733	$ 4,192	242%
Grant revenue	126	194	(68)	(35)%
Collaboration revenue	15	10	5	50%
Total revenue	6,066	1,937	4,129	213%
Operating Expenses:				
Cost of sales	1,017	193	824	427%
Research and development	554	401	153	38%
Selling, general and administrative	268	77	191	248%
Total operating expenses	1,839	671	1,168	174%
Income from operations	4,227	1,266	2,961	234%
Interest income	15	4	11	275%
Other expense, net	(13)	(10)	(3)	30%
Income before income taxes	4,229	1,260	2,969	236%
Provision for income taxes	572	39	533	1,367%
Net income	$ 3,657	$ 1,221	$ 2,436	200%

Revenue

Total revenue increased by $4.1 billion, or 213%, for the three months ended March 31, 2022, compared to the same period in 2021, mainly due to an increase in product sales from sales of our COVID-19 vaccine. Product revenue increased by $4.2 billion, or 242%, for the three months ended March 31, 2022, compared to the same period in 2021, largely driven by our manufacturing capacity ramp-up. Grant revenue decreased by $68 million, or 35%, for the three months ended March 31, 2022, compared to the same period in 2021, primarily driven by a decrease in revenue from BARDA related to our mRNA-1273 vaccine development.

Operating expenses

Cost of sales

Cost of sales for the three months ended March 31, 2022 was $1.0 billion, including third-party royalties of $207 million. Cost of sales for the three months ended March 31, 2022 increased by $824 million, or 427%, compared to the same period in 2021, primarily driven by higher product sales, and consequently higher third-party royalties and manufacturing costs.

Cost of sales as a percentage of product sales for the three months ended March 31, 2022 was 17%, compared to 11% for the same period in 2021. The increase was mainly driven by the lack of the pre-launch inventory benefit (that impacted the first quarter of 2021), coupled with inventory write-downs and a loss on firm purchase commitments. The increase was partially offset by a favorable customer mix and the scale up of our manufacturing processes. If inventory sold for the three months ended March 31, 2021 was valued at cost, our cost of sales for the period would have been $377 million, or 22%, of our product sales.

We expect our manufacturing costs to increase as we move from a pandemic to a seasonal market environment for our COVID-19 vaccine. We expect that this shift will cause our cost of sales for the full year of 2022 to represent a higher percentage of our product sales.

Research and development expenses

Research and development expenses increased by $153 million, or 38%, for the three months ended March 31, 2022, compared to the same period in 2021. The increase was primarily attributable to an increase in personnel-related costs of $39 million, an increase in clinical trial expenses of $38 million, an increase in technology and facility-related costs of $24 million, and an increase in consulting and outside services of $23 million. These increases for the three-month period in 2022 were largely driven by increased mRNA-1273 clinical development and headcount.

We expect that research and development expenses will increase in 2022 as we continue to progress our indication expansion of mRNA-1273, and continue to develop our pipeline and advance our product candidates into later-stage development, in particular our RSV and flu vaccine programs. In addition, we also expect to incur significant costs related to the development of variant-specific COVID-19 candidates and our next-generation COVID-19 vaccine candidate.

Selling, general and administrative expenses

Selling, general and administrative expenses increased by $191 million, or 248%, for the three months ended March 31, 2022, compared to the same period in 2021. The increase was mainly due to an endowment to the Moderna Charitable Foundation (the Foundation) of $50 million, an increase in distributor fees of $47 million, an increase in personnel-related costs of $31 million, an increase in consulting and outside services of $29 million, and an increase in marketing expenses of $15 million. These increases for the three-month period in 2022 were primarily driven by our COVID-19 vaccine commercialization-related activities, increased headcount, and the launch of the Foundation.

We expect that selling, general and administrative expenses will increase in 2022, as we continue to build out our global commercial, regulatory, sales and marketing infrastructure to support the commercialization of our COVID-19 vaccine, and continue to expand the number of programs and our business operations.

Interest income

Interest income increased by $11 million, or 275%, for the three months ended March 31, 2022, compared to the same period in 2021. The increase in interest income from our investments in marketable securities for the three-month period in 2022 were mainly driven by increased investment balances and an overall higher interest rate environment.

Other expense, net

The following table summarizes other expense, net for each period presented (in millions):

	Three Months Ended March 31,		Change 2022 vs. 2021	
	2022	2021	$	%
Loss on investments	$ (6)	$ —	$ (6)	100%
Interest expense	(6)	(3)	(3)	100%
Other expense, net	(1)	(7)	6	(86)%
Total other expense, net	$ (13)	$ (10)	$ (3)	30%

Total other expense, net increased by $3 million, or 30%, for the three months ended March 31, 2022, compared to the same period in 2021. The increase in other expense, net for the three-month period in 2022 was primarily due to realized losses on available-for-sale debt securities, partially offset by a net gain related to our balance sheet hedging activities, and foreign currency transactions and remeasurements. Our interest expense is primarily related to our finance leases. Please refer to Note 11 to our condensed consolidated financial statements.

Income taxes

Provision for income taxes increased by $533 million for the three months ended March 31, 2022, compared to the same period in 2021, primarily due to an increase in pre-tax income and a higher effective tax rate in 2022, as 2021 included tax benefit related to the release of the valuation allowance on the majority of our deferred tax assets. We expect that our effective tax rate will increase for the full year 2022 compared to 2021, mainly driven by the release of the valuation allowance on the majority of the deferred tax assets in 2021.

Liquidity and capital resources

The following table summarizes our cash, cash equivalents, investments and working capital for each period presented (in millions):

	March 31, 2022	December 31, 2021
Financial assets:		
Cash and cash equivalents	$ 5,048	$ 6,848
Investments	5,067	3,879
Investments, non-current	9,171	6,843
Total	$ 19,286	$ 17,570
Working capital:		
Current assets	$ 16,350	$ 16,071
Current liabilities	9,238	9,128
Total	$ 7,112	$ 6,943

Our cash, cash equivalents and investments are invested in accordance with our investment policy, primarily with a view to liquidity and capital preservation. Investments, consisting primarily of government and corporate debt securities, are stated at fair value. Cash, cash equivalents and investments as of March 31, 2022 increased by $1.7 billion, or 10%, compared to December 31, 2021. During the three months ended March 31, 2022, we generated cash from operations of $2.8 billion, partially offset by repurchases of our common stock of $623 million, purchases of property and equipment of $132 million, and unrealized losses on available-for-sale debt securities of $220 million.

Working capital, which is current assets less current liabilities, as of March 31, 2022 increased by $169 million, or 2%, compared to December 31, 2021, primarily due to a decrease in deferred revenue of $654 million and an increase in inventory of $501 million, mainly driven by revenue recognized from deferred revenue in excess of customer deposits received and our increased inventory levels. The increase was partially offset by a decrease in cash, cash equivalents and short-term investments of $612 million, primarily due to purchases of long-term marketable securities.

As of March 31, 2022, we did not have any off-balance sheet arrangements.

Cash flow

The following table summarizes the primary sources and uses of cash for each period presented (in millions):

	Three Months Ended March 31,	
	2022	2021
Net cash provided by (used in):		
Operating activities	$ 2,763	$ 2,971
Investing activities	(3,921)	(180)
Financing activities	(642)	26
Net (decrease) increase in cash, cash equivalents and restricted cash	$ (1,800)	$ 2,817

Operating activities

We derive cash flows from operations primarily from cash collected from customer deposits and accounts receivable related to our COVID-19 vaccine supply agreements, as well as certain government-sponsored and private organizations and strategic alliances. Our cash flows from operating activities are significantly affected by our use of cash for operating expenses and working capital to support the business.

In the third quarter of 2020, we entered into supply agreements with the U.S. Government, other international governments, and Gavi for the supply of our COVID-19 vaccine and received upfront deposits. As of March 31, 2022, we had $5.9 billion in deferred revenue related to customer deposits received or billable. In addition, we expect to continue to receive funding from our contract with BARDA related to our mRNA-1273 program. As of March 31, 2022, the remaining available funding from BARDA, net of revenue earned was $378 million.

Net cash provided by operating activities for the three months ended March 31, 2022 was $2.8 billion and consisted of net income of $3.7 billion and non-cash adjustments of $5 million, partially offset by a net change in assets and liabilities of $0.9 billion. Non-cash items included deferred income taxes of $146 million, depreciation and amortization of $79 million, stock-based compensation of $44 million, and amortization of investment premium and discount of $18 million. The net change in assets and liabilities was mainly due to a decrease in deferred revenue of $805 million, an increase in inventory of $501 million, and an increase in prepaid expenses and other assets of $414 million, partially offset by an increase in income taxes payable of $716 million.

Net cash provided by operating activities decreased by $208 million, or 7%, during the three months ended March 31, 2022, compared to the same period in 2021, primarily attributable to revenue recognized from deferred revenue in excess of customer deposits received, partially offset by increased product sales and higher collection of receivables.

Investing activities

Our primary investing activities consist of purchases, sales, and maturities of our investments and capital expenditures for leasehold improvements, manufacturing, laboratory, computer equipment and software.

Net cash used in investing activities for the three months ended March 31, 2022 was $3.9 billion, which included purchases of marketable securities of $5.6 billion and purchases of property and equipment of $132 million, partially offset by proceeds from sales of marketable securities of $1.4 billion and proceeds from maturities of marketable securities of $441 million.

Net cash used in investing activities increased by $3.7 billion during the three months ended March 31, 2022, compared to the same period in 2021, primarily reflecting timing differences related to purchases, sales, and maturities of marketable debt securities and changes in our portfolio-mix.

Financing activities

Net cash used by financing activities for the three months ended March 31, 2022 was $642 million, primarily from repurchases of common stock of $623 million.

Net cash used in financing activities increased by $668 million during the three months ended March 31, 2022, compared to the same period in 2021, mainly due to repurchases of common stock.

Operation and funding requirements

Our principal sources of funding as of March 31, 2022 consisted of cash and cash equivalents, investments, and cash we expect to generate from operations. We generated net income of $12.2 billion for the year ended 2021, following the authorization of our first commercial product in December 2020. From our inception to the end of 2020, we incurred significant losses from operations due to our significant research and development expenses. We have retained earnings of $13.6 billion as of March 31, 2022.

We have significant future capital requirements including expected operating expenses to conduct research and development activities, operate our organization, meet capital expenditure needs, and fund our share repurchase program (refer to Note 13 to our condensed consolidated financial statements). We expect our expenses to increase in connection with our ongoing activities, particularly as we continue research and development of our development candidates and clinical activities for our investigational medicines. We also expect our expenses to increase associated with manufacturing costs, including our arrangements with our international supply and manufacturing partners. Our ongoing work on mRNA-1273, including development of any new generations of boosters and vaccines against variants of SARS-CoV-2, and buildout of global commercial, regulatory, sales and marketing infrastructure to support the commercialization of our COVID-19 will require significant cash outflows during 2022, most of which may not be reimbursed or otherwise paid for by our partners or collaborators. In addition, we have substantial facility, lease and purchase obligations (refer to Note 11 and Note 12 to our condensed consolidated financial statements). We have entered into certain collaboration agreements with third parties that include the funding of certain research and development activities and potential future milestone and royalty payments by us.

We believe that our cash, cash equivalents, and investments as of March 31, 2022, together with cash expected to be generated from operations, will be sufficient to enable us to fund our projected operations, capital expenditures and stock repurchases through at least

the next 12 months from the issuance of these financial statements included in this Form 10-Q. We are subject to all the risks related to the development and commercialization of novel medicines, and we may encounter unforeseen expenses, difficulties, complications, delays, and other unknown factors including expenses related to the ongoing COVID-19 pandemic, which may adversely affect our business. Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect.

If we fail to sustain profitability on a continuing basis, we may be required to finance future cash needs through a combination of public or private equity offerings, structured financings and debt financings, government funding arrangements, potential future strategic alliances from which we receive upfront fees, milestone payments, and other forms of consideration, and marketing, manufacturing, distribution and licensing arrangements. If we are required to finance future cash needs, additional capital may not be available on reasonable terms, if at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back, or discontinue the development or commercialization of one or more of our investigational medicines, or slow down or cease work on one or more of our programs. If we raise additional funds through the issuance of additional equity or debt securities, it could result in dilution to our existing stockholders or increased fixed payment obligations, and any such securities may have rights senior to those of our common stock. If we incur indebtedness, we could become subject to covenants that would restrict our operations and potentially impair our competitiveness, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If we raise funds through strategic alliances or marketing, distribution, or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs, or investigational medicines or grant licenses on terms that may not be favorable to us. Any of these events could significantly harm our business, financial condition, and prospects.

Contractual Obligations

As of March 31, 2022, other than disclosed within Note 11 and Note 12 to our condensed consolidated financial statements, there have been no material changes to our contractual obligations and commitments from those described under “Management’s Discussion and Analysis of Financial Condition and Results of Operations” included in our 2021 Form 10-K.

Item 3. Quantitative and Qualitative Disclosures about Market Risk

Our market risks, and the way we manage them, are summarized in Part II, Item 7A, “Quantitative and Qualitative Disclosures About Market Risk” of our 2021 Form 10-K. There have been no material changes to our market risk or to our management of such risks for the three months ended March 31, 2022.

Item 4. Controls and Procedures

Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of March 31, 2022. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934 (the Exchange Act) means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of March 31, 2022, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Changes in Internal Control over Financial Reporting

There were no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the three months ended March 31, 2022, which have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Inherent Limitations on Effectiveness of Controls

Our management, including our Chief Executive Officer and Chief Financial Officer, believes that our disclosure controls and procedures and internal control over financial reporting are designed to provide reasonable assurance of achieving their objectives and are effective at the reasonable assurance level. However, our management does not expect that our disclosure controls and procedures or our internal control over financial reporting will prevent all errors and all fraud. A control system, no matter how well-conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. These inherent limitations include the realities that judgments in decision making can be faulty, and that breakdowns can occur because of a simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by the collusion of two or more people or by a management override of the controls. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, controls may become inadequate because of changes in conditions, or the degree of compliance with policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

PART II

Item 1. Legal Proceedings

We are involved in various claims and legal proceedings of a nature considered ordinary course in our business, including the intellectual property litigation described below. Most of the issues raised by these claims are highly complex and subject to substantial uncertainties. For a description of risks relating to these and other legal proceedings we face, see Part I, Item 1A, “Risk Factors,” of our 2021 Form 10-K filed in February 2022, including the discussion under the headings entitled “Risks related to our intellectual property,” and “Risks related to the manufacturing of our commercial products, development candidates, investigational medicines and our future pipeline.”

The outcome of any such proceedings, regardless of the merits, is inherently uncertain; therefore, assessing the likelihood of loss and any estimated damages is difficult and subject to considerable judgment. We describe below those legal matters for which a material loss is either (i) possible but not probable, and/or (ii) not reasonably estimable at this time.

Proceedings Related to Patents Owned by Arbutus

On February 28, 2022, Arbutus Biopharma Corporation (Arbutus) and Genevant Sciences GmbH (Genevant) filed a complaint against Moderna in the U.S. District Court for the District of Delaware asserting that Moderna’s manufacture, use, offer to sell, or sales within the United States (as well as importation into the United States) of its COVID-19 vaccine, or active inducement of the same, willfully infringes U.S. Patent Nos. 8,058,069, 8,492,359, 8,822,668, 9,364,435, 9,504,651, and 11,141,378, which concern lipid nanoparticles. The action is *Arbutus Biopharma Corp. et al. v. Moderna Inc. et al.*, Case No. 1:22-cv-00252-MN (D. Del.). Arbutus and Genevant are not seeking to prevent or stop the marketing or sales of Moderna's COVID-19 vaccine. The complaint seeks a judgment of infringement of the asserted patents, monetary damages (together with interest), costs and expenses of the lawsuit, and attorneys’ fees.

Proceedings Related to Patents Owned by Alnylam

On March 17, 2022, Alnylam Pharmaceuticals, Inc. (Alnylam) filed a complaint against Moderna in the U.S. District Court for the District of Delaware asserting that Moderna’s manufacture, use, offer to sell, or sales within the United States (as well as import into the United States) of its COVID-19 vaccine, or active inducement of the same, infringes U.S. Patent No. 11,246,933, which issued on February 15, 2022, and concerns cationic lipids. The action is *Alnylam Pharmaceuticals, Inc. v. Moderna, Inc. et al.*, Case No. 1:22-cv-00335-CFC (D. Del.). Alnylam is not seeking to prevent or stop the marketing or sales of Moderna's COVID-19 vaccine. The complaint seeks a judgment of infringement of the asserted patent, monetary damages (together with interest), costs and expenses of the lawsuit, and attorneys’ fees.

Item 1A. Risk Factors

Information regarding risk and uncertainties related to our business appears in Part I, Item 1A. “Risk Factors” of our 2021 Form 10-K. There have been no material changes from the risk factors previously disclosed in the 2021 Form 10-K other than set forth below.

We may encounter difficulties producing, shipping or successfully commercializing our COVID-19 vaccine consistent with our existing or potential contractual obligations, including due to changes in market dynamics or delays or difficulties experienced by our commercial partners.

In response to the global COVID-19 pandemic, we are continuing to pursue the rapid manufacture, distribution and clinical testing of our COVID-19 vaccine (mRNA-1273), which is our only commercial product and source of product revenues. We may encounter difficulties producing the vaccine on the timelines and in the quantities set forth in our existing or future supply agreements. We may also be unsuccessful in entering into contracts for future sales of COVID-19 vaccines. Our ability to commercialize an effective vaccine depends on our manufacturing capability, both at our own manufacturing facility and those of our manufacturing partners, which we rapidly scaled in response to the pandemic. We are committing substantial financial resources and personnel to the development, manufacture and distribution of our COVID-19 vaccine, including to support the scale-up of manufacturing to enable our pandemic response, which may cause delays in or otherwise negatively impact our other development programs. We may need to, or the U.S. government may require us to, divert resources and capital from our other programs to the production of COVID-19 vaccines.

We do not have sufficient internal manufacturing infrastructure to support the global roll-out of our COVID-19 vaccine on our own. We have entered into strategic collaborations for the production, as well as for commercial fill-finish manufacturing, of our COVID-19 vaccine to supply markets both in and outside the United States. We may need to engage additional collaborators in the future, including contract manufacturing organizations (CMOs), government and non-government organizations, and other manufacturing partners, to assist in meeting our capacity needs. If we cannot enter into such arrangements on favorable terms, or at all, our ability to develop, manufacture and distribute our COVID-19 vaccine would be adversely affected.

Prior to 2020, we had not ramped up our organization for a commercial launch of any product, and doing so during a pandemic with an urgent, critical global need poses additional challenges, such as setting up distribution channels, building global teams with specialized skills, and managing potential intellectual property disputes or challenges. We may also face challenges sourcing a sufficient amount of raw materials to support the demand for our COVID-19 vaccine. We may be unable to effectively create a supply chain for the vaccine to adequately support demand as we rely on our third-party collaborators being able to fulfill demand. For example, we have in the past and may in the future experience international shipping delays as our supply chain expands and grows more complex. Any capacity or production issues or delays experienced by our collaborators may cause us to fail to meet certain product volume or delivery timing obligations under our COVID-19 supply agreements. Furthermore, we expect to continue to make significant investments in our manufacturing capacity and commercial network as we continue to expand our commercial launch efforts.

Additionally, evolving dynamics in the market for COVID-19 vaccines are likely to impact our results. For example, we anticipate that our product mix will shift from a two-dose 100 µg primary series to 50 µg booster doses as COVID-19 evolves to an endemic phase, with greater seasonality of sales linked to the fall and winter season in the Northern and Southern Hemispheres. As a result of this change in product mix, we will likely require lower levels of raw materials and production capacity as the market shifts to seasonal booster doses. This change in product mix and evolving market dynamics will require us to purchase fewer raw materials and scale back our manufacturing operations with contract manufacturers, which have in the past and may in the future result in increased costs associated with exiting commitments with suppliers, as well as charges to write off unused inventory. If we are unable to effectively manage evolving demand dynamics, our business, financial condition, results of operations, and prospects may be negatively impacted.

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

Issuer Purchases of Equity Securities

The following table provides information with respect to the shares of common stock repurchased by us during the three months ended March 31, 2022:

Period	Total Number of Shares Purchased	Average Price Paid per Share [1]	Total Number of Shares Purchased as Part of Publicly Announced Program	Approximate Dollar Value of Shares that May Yet Be Purchased Under the Program (in millions)
January 1 - January 31, 2022 [2]	604,018	$ 236.33	4,092,160	$ —
February 1 - February 28, 2022	—	$ —	—	$ —
March 1 - March 31, 2022 [3]	3,211,425	$ 149.46	3,211,425	$ 2,520
Total	3,815,443			

[1] Average price paid per share includes related expenses.
[2] Relates to our 2021 Repurchase Program
[3] Relates to our 2022 Repurchase Program

Refer to Note 13 to condensed consolidated financial statements for information regarding our share repurchase programs.

Item 6. Exhibits

The Exhibits listed below are filed or incorporated by reference as part of this Form 10-Q.

Exhibit No.	Exhibit Index
10.1*#	Offer Letter by and between ModernaTX, Inc. and Jorge Gomez, dated as of April 6, 2022.
10.2*#	Executive Retirement and Strategic Consulting Agreement by and between ModernaTX, Inc. and David Meline, dated as of April 10, 2022.
10.3†	Amendment Nos. P00018, P00019, P00020 and P00021 to Award Contract No. W911QY20C0100, by and between Moderna US Inc. and the Army Contracting Command of the U.S. Department of Defense, dated August 9, 2020 (incorporated by reference to Exhibit 10.40 to the Company's Annual Report on 10-K for the fiscal year ended December 31, 2021, filed on February 25, 2022).
10.4*†	Amendment No. 12 to Agreement No. HHSO100201600029C, by and between ModernaTX, Inc. and the Biomedical Advanced Research and Development Authority, dated as of March 23, 2022.
10.5*†	Amendment Nos. P00022 and P00023 to Award Contract No. W911QY20C0100, by and between Moderna US Inc. and the Army Contracting Command of the U.S. Department of Defense, dated August 9, 2020.
31.1*	Certification of Principal Executive Officer pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) and Rule 15d-14(a) of the Securities Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1+	Certification pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
101.INS*	XBRL Instance Document - The instance document does not appear in the Interactive Data File because its XBRL tags are embedded within the Inline XBRL document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Link Document
104*	Cover Page Interactive Data File (formatted as Inline XBRL with applicable taxonomy extension information contained in Exhibits 101.)

* Filed herewith

† Portions of this exhibit (indicated by asterisks) have been omitted in accordance with the rules of the Securities and Exchange Commission.

# Indicates a management contract or any compensatory plan, contract or arrangement.

+ The certification furnished in Exhibit 32.1 hereto is deemed to accompany this Form 10-Q and will not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, as amended. Such certification will not be deemed to be incorporated by reference into any filings under the Securities Act of 1933, as amended, or the Securities Exchange Act of 1934, as amended, except to the extent that the Registrant specifically incorporates it by reference.

SIGNATURES

Pursuant to the requirements of the Section 13 or 15(d) 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.

MODERNA, INC.

Date:
May 4, 2022

By: /s/ Stéphane Bancel

Stéphane Bancel
Chief Executive Officer and Director
(*Principal Executive Officer)*

Date:
May 4, 2022

By: /s/ David W. Meline

David W. Meline
Chief Financial Officer
(*Principal Financial Officer)*

moderna

200 Tech Square • Cambridge, MA 02139
phone 617-714-6500 • fax 617-583-1998

April 4, 2022
VIA ELECTRONIC MAIL

Jorge M. Gomez
[***]
[***]

Re: Offer of Employment with Moderna

Dear Jorge:

On behalf of Moderna (ModernaTx, Inc. or, alternatively, one of its US-based subsidiaries to which you may be assigned, hereafter "Moderna" or the "Company"), it is my privilege to offer you the opportunity to join our mission: to boldly, curiously, and relentlessly deliver on the promise of mRNA technology to transform the lives of patients. We are confident that, as you leverage our Moderna Mindsets to help build and grow the best possible version of Moderna, you will experience challenge, satisfaction, collaboration, and opportunity for professional and personal growth.

Role and Start Date: You will join Moderna in the position of Chief Financial Officer as a regular, full-time employee. Your first day of employment will be on May 9, 2022 (the "Start Date") and your regular place of work will be at the Company's offices in Cambridge, Massachusetts, although you will be working from your home office in North Carolina prior to your relocation, which is expected to occur before December 31, 2022.

Moderna Total Rewards: As a Moderna executive, you are eligible for a meaningful total compensation and rewards program, inclusive of:

Base Compensation: You will be paid an annualized base salary of USD$700,000 at the rate of USD$26,923.08 per bi-weekly pay period. Your salary is subject to deductions and withholdings as required by law. As a salaried, exempt employee, you will not be eligible for overtime payments. Adjustments in your Base Salary, if any, will only be made in a manner that is consistent with the rest of the executive team and at the direction of the Board of Directors (and shall otherwise be subject to your rights under the Amended and Restated Executive Severance Plan ("ESP"). The Company acknowledges and agrees that you shall be a Participant in the current ESP upon your Start Date.

Sign On Cash Bonus: If you accept this offer, you will receive a one-time gross sign-on payment of $500,000 (the "Sign On Bonus") within thirty (30) days following the Start Date (the "Payment Date") unless you give notice of your resignation, resign, or your employment terminates for any reason prior to the Payment Date. If you resign for any reason or are terminated by the Company for Cause (as defined below), both within twenty-four (24) months of the Payment Date, you will be required to and agree to repay the Company for the total net amount of the Sign On Bonus within one week of your separation date, and to the maximum extent permitted by law, you authorize the Company to deduct any owed Sign On Bonus as a valid set-off from your final wages, any accrued and unused vacation pay, bonus, outstanding expense reimbursement, and/or any other payments or compensation owed to you by the Company. For purposes of this section, "Cause" means one or more of the following events, as determined in the Company's reasonable discretion: (i) your failure to perform or negligence in performing (other than by reason of disability or death) your duties and responsibilities as a Company employee; (ii) your failure to comply with the requirements of the Company's Code of Conduct or any other Company standards, policies, or practice(s) regarding acceptable workplace conduct; (iii) a breach by you of any provision of this offer letter (including its Exhibit A) or any of the other agreements you

may have with the Company; (iv) your conviction of, or the entry of a pleading of guilty or nolo contendere to, any crime involving fraud or embezzlement or any felony; or (iv) any form of fraudulent conduct.

Benefits: Moderna is proud to provide you with a comprehensive suite of innovative health and wellbeing benefits to support our diverse and multigenerational workforce. As a regular employee working over 20 hours per week, you will be eligible for various employee benefit programs offered to Company employees in comparable positions in line with the eligibility requirements and other terms of the Company's benefit plans and/or policies. These benefits currently include paid vacation and sick time, group medical and dental insurance, group life insurance, short and long-term disability insurance, and a 401(k) plan with a Company match, along with many other wellness benefits. The eligibility requirements and other information regarding these benefits are set forth in the Company's Summary of Benefits and more detailed documents available from the Company. With the exception of the "employment at will" policy below, Moderna may, from time to time in its sole discretion, modify the benefits offered to employees and any associated plans or policies. Where a benefit is subject to a formal plan (for example, medical insurance or life insurance), eligibility to participate in and receive such benefit is controlled solely by the applicable plan document.

Relocation: Moderna, through its global mobility program, will assist you with your move from Charlotte, North Carolina to the greater Cambridge, Massachusetts region by offering you a relocation benefits package through our relocation provider corresponding with your role (the "Relocation Expenses"). This relocation package, which is limited to one per household, is conditional on your acceptance of this offer of employment and will be available to you for between three (3) and twelve (12) months from the Start Date, depending on your function (with the actual date of your relocation designated as the "Relocation Date"). You understand and agree that in the event you terminate your employment with the Company for any reason (except due to your death or disability), or if you are involuntarily terminated by the Company (except due to job elimination or separation in connection with a reduction in force) within 24 months of the Relocation Date, you will reimburse the Company for 100% of all Relocation Expenses paid or reimbursed on your behalf (provided you separate within 12 months of the Relocation Date) or 50% of all Relocation Expenses paid or reimbursed on your behalf (provided you separate within 13-24 months of the Relocation Date). For purposes of this section, the term "Relocation Expenses" shall include but is not limited to (a) all direct expenses regarding your relocation incurred by the Company and (b) any expenses related to your relocation that are reimbursed by the Company. You agree to reimburse the Company for the applicable amount of Relocation Expenses owed pursuant to this section within thirty (30) days after the later of your separation date or the date you receive an itemization of Relocation Expenses incurred from the Company. In the event you fail to make timely reimbursement of Relocation Expenses, you agree to further reimburse the Company for any and all attorneys' fees and costs incurred by the Company in enforcing your repayment obligations. The Company will determine in its reasonable judgment what portion, if any, of the Relocation Expenses are nondeductible expenses in accordance with applicable tax law and will comply with all tax reporting obligations. Payment of the Relocation Expenses is contingent upon you first signing a Relocation Expense Repayment Agreement, which is enclosed with this offer letter.

Annual Performance Bonus Program: Employees at Moderna work hard and are well rewarded for their performance. To that end, you will be eligible to participate in the Company's annual performance bonus program, subject to its terms and conditions, with the potential to earn an annual performance bonus at an initial target level of 90% of your then annual base compensation. Performance bonuses under the Company's annual performance bonus program are subject to the Company's sole discretion

based upon multiple factors, including but not limited to the Company's performance, overall business conditions, and your individual performance and likelihood of continued employment, which means that any annual performance bonus could be higher, lower or equivalent to the target bonus amount. The components of the Company's annual incentive bonus program are subject to periodic review and adjustment. As your Start Date with the Company is between January 1 and the first Monday of October of this year, you will be eligible to earn an annual incentive bonus payment for this year prorated to your length of employment during this calendar year. You must be actively employed by the Company at the time annual performance bonus awards are distributed to employees in your role to be eligible to receive an annual performance bonus award. Annual performance bonus awards are typically paid on or before March 15 of the calendar year following the bonus eligibility year.

New Hire and Long-Term Incentive Equity Program: As an additional incentive for you to join the Company and to contribute to its long-term growth, you will be eligible to participate in both new hire and annual long-term equity incentive award programs. Subject to approval by the Company's Board of Directors (the "Board") and the Company's parent entity, within thirty (30) trading days of your Start Date you will be granted a new hire long term equity award equivalent to a total value of $4,000,000 (the "New Hire Equity Award") with the effective date of the New Hire Equity Award being the date the grant is approved by the Board (the "Grant Date"). Further, subject to the Board's approval, you also will be eligible to receive an annual long-term equity award related to your performance during the eligible performance period and potential for long-term impact (the "Annual Equity Award") provided your Start Date is on or before the first Monday in October of this year. The target grant value of an Annual Equity Award at your level is currently $3,000,000 to $4,000,000. Annual Equity Awards typically will be issued in the first quarter of the year. The New Hire Equity and Annual Equity Award grants are conditioned upon, among other things, your execution of all incentive award program documentation required by the Company. At this time, the Board has approved that the New Hire Equity Award and subsequent Annual Equity Awards (each, an "Equity Award") will vest according to the following schedule: 25% of the Equity Award will vest on the first anniversary of the date of grant, and the remaining 75% of the Equity Award will vest in equal calendar quarterly installments over the next three (3) years. As a condition to the vesting of each installment of any Equity Award, you must be actively employed by the Company as of the relevant vesting date without any prior interruption of service. All Equity Awards are subject to the terms and conditions of the Company's equity award plans and Board approvals, as they may be amended from time to time.

You shall also be provided a Moderna, Inc. Officer's Indemnification Agreement, which shall be in addition to any rights of indemnification to which you may be entitled under applicable law, Moderna's organizing documents, a vote of stockholders or a resolution of directors, or otherwise.

All compensation, payments, stock, stock options, and benefits referred to above are subject to withholdings, taxes and other deductions as required by applicable laws or regulations.

There are many additional benefits to joining Moderna and they are outlined in further detail at https://modernabenefits.com/fair/index and throughout the onboarding process.

Preparing For Your Moderna Experience To Begin:

Protection of Moderna Innovation: In connection with your employment, you will be exposed to and provided with confidential and/or trade secret information about the Company and its present and future operations, products, and services ("Confidential Information"). In order to protect such

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Confidential Information and the Company's goodwill, this offer of employment is contingent upon you signing the Employee Confidentiality, Assignment, Nonsolicitation and Noncompetition Agreement (the "Restrictive Covenant Agreement"), attached to this offer letter as Exhibit A, and your ongoing observance of its terms.

Protection Of Third-Party Innovation: You represent that your employment with the Company does not violate any pre-existing restriction, obligation or contract, and that you are not subject to any agreements with non-competition, non-solicitation, invention assignment, proprietary information, confidentiality, or similar provisions that could prevent you from devoting your full business time, know-how, and attention to your work at the Company. You understand that your initial and continued employment with the Company is contingent upon the accuracy of this representation. If you are subject to any such restriction or agreement, please immediately provide me with a copy of the applicable agreement for review prior to accepting this offer. You also represent and agree that you will abide by the terms of any ongoing obligations to your present or prior employers or any other person, including but not limited to promises relating to the hiring or solicitation of employees, the solicitation of clients or customers, and maintaining the confidentiality of proprietary information or trade secrets. By accepting this offer, you agree that you will not, at any time, bring with you to the Company or use or disclose any confidential or proprietary information or trade secrets of any person, employer, or entity with whom or with which you have an agreement or obligation to keep in confidence that are not generally available to the public or have not been legally transferred to you or the Company.

Pre-Hire Requirements: This offer of employment is contingent upon the satisfactory completion of professional reference and background checks (which include verification of employment and education as well as a job-related criminal background screen) and a pre-employment drug test. We suggest that you do not resign from your current position and do not relocate until you have received confirmation from the Company that these pre-hire requirements have been successfully completed, as this offer will be rescinded if any of the above conditions are not satisfied. This offer is also contingent upon satisfactory proof of your right to work in the United States. Please expect to complete an I-9 Employment Verification Form with supporting documentation of eligibility to work in the United States on or immediately prior to your Start Date. By accepting this offer, you certify that you have not been debarred by the U.S. Food and Drug Administration or excluded from participation in federal health care programs by the Office of Inspector General, and further certify that in the event you are so debarred or excluded at any time during your employment, you will immediately report this to the Company's Compliance team. You understand that the Company and its agents may conduct ongoing checks of criminal history and other relevant government databases to confirm that your continued employment does not violate any of the Company's compliance obligations and authorize the Company and its agents to conduct such checks as needed.

PLEASE NOTE: *Moderna currently maintains a requirement that all US-based employees be fully vaccinated against COVID-19 prior to their employment start date unless a reasonable accommodation is approved for those unable to be vaccinated where it is not an undue hardship to the Company to do so as provided under federal, state, and local law.*

At-Will Employment: This offer letter does not constitute a contract of employment for any specific time period. You may terminate your employment with the Company at any time and for any reason simply by notifying the Company in writing. Likewise, the Company may terminate your employment at any time, with or without cause or advance notice, and as needed in a dynamic business, may change your job duties, title, reporting structure, and other terms and conditions of employment at any time,

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for any legal reason, subject to and in accordance with the terms and conditions of the ESP and other executive plans that may be applicable to you from time to time. Your employment at-will status can only be modified in a written agreement signed by you and the Chief Executive Officer of the Company or his designee.

Entire Agreement: This offer letter, together with the Restrictive Covenant Agreement, forms the complete employment arrangement with the Company and supersedes any other agreements or promises made to you by anyone regarding this offer, whether oral or written. Changes to your initial employment terms, require a written modification signed by you and the Company's Chief Executive Officer. The terms of this offer letter and the resolution of any disputes arising out of, related to, or in any way connected with this offer letter or your employment with the Company will be governed by the laws of the Commonwealth of Massachusetts, without giving effect to conflict of law provisions.

We look forward to your acceptance of this offer. You acknowledge and agree that electronic signatures, whether digital or encrypted, of you and the Company on this offer letter are intended to have the same force and effect as manual signatures.

We look forward to you joining the Moderna team and are pleased that you will be working with us to build a transformative company for patients.

On behalf of Moderna,

/s/ Tracey Franklin

Tracey Franklin
Chief Human Resources Officer

YOU ACKNOWLEDGE THAT YOU HAVE CAREFULLY READ THIS OFFER, INCLUDING ITS EXHIBIT A, AND UNDERSTAND AND AGREE TO ALL OF ITS PROVISIONS AND CONDITIONS AS DEMONSTRATED BY YOUR ELECTRONIC SIGNATURE. YOU FURTHER REPRESENT THAT YOU WERE GIVEN THIS OFFER, INCLUDING ITS EXHIBIT A, AT LEAST TEN DAYS PRIOR TO THE START DATE AND HAD THE OPPORTUNITY TO REVIEW IT WITH A REPRESENTATIVE OF YOUR CHOOSING.

/s/ Jorge M. Gomez

4-6-22

moderna

April 8, 2022

VIA ELECTRONIC MAIL

Personal and Confidential

David Meline
[***]
[***]

Re: Executive Retirement and Strategic Consulting Agreement

Dear David:

Under the Offer of Employment dated June 2, 2020 between you and ModernaTX, Inc. (together with its parents, subsidiaries, and affiliates, the "*Company*" and, together with you, the "*Parties*"), this Executive Retirement and Strategic Consulting Agreement (the "*Agreement*") sets forth the terms of your voluntary retirement from the Company on your planned retirement date of July 8, 2022 (the "*Retirement Date*") or such earlier date if your employment is terminated due to your death or Disability or by the Company for Cause[1] (whichever date is earlier, the "Last Day Worked") and, in the event of your planned retirement on the Retirement Date, offers you the opportunity to provide consulting services for the Company through July 8, 2024. Until the Last Day Worked, you will continue to receive your current base salary and benefits and continue to vest in any outstanding equity, but you will not be expected to perform duties other than transitional duties as requested by the Company's Chief Executive Officer ("*CEO*") and other members of the Executive Committee.

Regardless of whether you enter into this Agreement, the following terms shall apply:

- The Company shall pay you for all base salary plus payment for any unused vacation accrued through the Last Day Worked.
- Your eligibility to participate in the Company's medical plans will cease on the last day of the month inclusive of the Last Day Worked. You may elect to continue your medical benefits under the federal COBRA law. You will be notified by separate notice of your rights and obligations under COBRA.
- Your eligibility to participate in the Company's other employee benefit plans and programs will cease on the Last Day Worked. You are not eligible to receive an annual bonus or other forms of incentive compensation with respect to your work for the Company during the fiscal year 2022 or thereafter.
- You shall have the right to retain any and all vested restricted stock units and to exercise any and all vested options that you hold to purchase the equity of the Company, and any such exercise shall be made under and shall be subject to, the terms of any and all applicable unit option and grant plans, equity incentive plans, and all other equity award plans and all agreements relating to any of the foregoing (collectively referred to as the "*Equity Documents*"), including without limitation the time limits on exercise.
- You and the Company have agreed that your voluntary retirement does not constitute Good Reason as defined in and for purposes of the ESP.

[1] The terms "Cause" and "Disability" are defined by the Company's Amended and Restated Executive Severance Plan in effect as of the Retirement Date (the "*ESP*").

- On the Last Day Worked, or such alternative earlier date designated by the Company, you will be deemed to have resigned from all officer positions that you hold with the Company or any of its respective subsidiaries and affiliates. You shall execute any documents in the form requested by the Company to confirm or effectuate any such resignations.

- You are obligated, to the maximum extent permitted by applicable law, to comply with the obligations outlined in the Employee Confidentiality, Assignment, Noncompetition, and Nonsolicitation Agreement you executed in connection with the inception of your employment (the "*Restrictive Covenants Agreement*"), although the Company acknowledges that any non-competition and employee non-solicitation provisions contained in the Restrictive Covenants Agreement are not enforceable in the state in which you currently reside.

The terms set forth above are not affected by whether or not you enter into this Agreement.

With those understandings, you and the Company agree as follows:

1. Conditions. Subject to the terms of this Agreement, you will be entitled to continue to be employed at the Company through the Retirement Date and receive the Transition Benefits (defined below) *provided* you satisfy each of the following (collectively, the "*Conditions*"): (i) you timely enter into this Agreement, do not timely revoke it, and at all times comply with its terms; (ii) your employment is not terminated by the Company for Cause, due to death or Disability, or as a result of your voluntary resignation before the Retirement Date; (iii) you work cooperatively and in good faith with the Company on all transition-related matters; and (iv) you comply with the Restrictive Covenants Agreement (as modified by this Agreement).

2. Transition Benefits. If you satisfy each of the Conditions, the Company will provide you with the following post-employment benefits (collectively, the "*Transition Benefits*"):

(a) Strategic Consulting.

1. You agree to provide, between the Retirement Date and July 8, 2024 (the "*Strategic Consulting Period*"), strategic consulting services concerning financial matters (the "*Services*") as requested by the CEO, on a timetable mutually agreed between you and the CEO via telephone and/or written consultations. You shall retain the sole control and discretion to determine the methods by which you perform the Services.

2. As full consideration for the performance of the Services, you shall continue to vest through July 8, 2024 in (i) the unvested portions of the New Hire Equity Award, as that term is defined in the Offer of Employment dated June 2, 2020 between you and ModernaTX, Inc. (the "*Offer Letter*") and (b) the unvested portions of the 2021 Annual Equity Grant issued on February 9, 2021 (which shall include the portions of the 2021 Annual Equity Grant issued as an option award and as an RSU award), both subject to the terms of the Equity Documents; the vesting for the portion of your 2021 Annual Equity Grant issued as a performance-based restricted stock unit award, or PSU, will end on the Last Day Worked, as contemplated by that award.

3. You acknowledge and agree that you are not eligible for any cash compensation related to performing the Services and that the opportunity to continue vesting in the New Hire Equity Award and the 2021 Annual Equity Grant is adequate consideration to support this Agreement. You may exercise any vested portions of either the New Hire Equity Award or the 2021 Annual Equity Grant under the terms of the Equity Documents and subject to the Insider Trading Policy of Moderna, Inc., a copy of which you acknowledge you have received, as

well as any applicable time limits on exercisability, which for the avoidance of doubt, will extend through the date that is three months after the end of the Strategic Consulting Period.

4. You further acknowledge that the Company's Code of Business Ethics and Conduct (available at www.modernatx.com) will be applicable throughout the Strategic Consulting Period.

3. General Release of Claims. In consideration for, among other terms, remaining employed through the Retirement Date and receipt of the Transition Benefits, to which you acknowledge that you would otherwise not be entitled, you voluntarily release and forever discharge the Company, its affiliated and related entities (including, without limitation, direct and indirect parent companies (including, without limitation, Moderna, Inc.), and direct and indirect subsidiaries and direct and indirect affiliates), its and their respective predecessors, successors and assigns, its and their respective employee benefit plans and fiduciaries of such plans, and the past, present and future officers, directors, stockholders, members, managers, employees, attorneys, accountants, agents and representatives of each of the foregoing in their official and personal capacities (collectively referred to as the "*Releasees*") generally from all claims, demands, debts, damages and liabilities of every name and nature, known or unknown ("*Claims*") that, as of the date when you sign this Agreement, you have, ever had, now claim to have or ever claimed to have had against any or all of the Releasees, to the maximum extent permitted by applicable law. This release includes, without limitation, all Claims: relating to your employment by and termination of employment with the Company; of wrongful discharge; of breach of contract; of discrimination or retaliation under federal, state, or local law (including, without limitation, Claims of discrimination or retaliation under Title VII of the Civil Rights Act of 1964, the Civil Rights Act of 1866, the Rehabilitation Act of 1973, the Civil Rights Act of 1991, the Americans with Disabilities Act of 1991 (ADA), the Family and Medical Leave Act (FMLA), the Age Discrimination In Employment Act (ADEA), the Older Workers Benefit Protection Act (OWBPA), the Employee Retirement Income Security Act (ERISA), the Worker Adjustment and Retraining Notification Act (WARN), the California Labor Code, the California Fair Employment and Housing Act (FEHA), the Massachusetts Fair Employment Practices Act, Massachusetts General Laws ch. 151B, and any other federal, state, or local statute or regulation regarding discrimination in employment or the termination of employment; any claims or allegations brought under the Equal Pay Act, the National Labor Relations Act (NLRA), or for non-payment of wages, bonuses, commissions, severance pay (under the ESP or otherwise), or other compensation, including but not limited to under the California Labor Code, the Massachusetts Civil Rights Act, the Massachusetts Equal Rights Act, the Massachusetts Parental Leave Act, the Massachusetts Labor and Industries Act, the Massachusetts right of privacy law, the Massachusetts Wage Act, the Massachusetts Earned Sick Time law, the Massachusetts Equal Pay Act, and the Massachusetts Minimum Fair Wage Law; and for libel, slander, breach of contract, breach of the implied covenant of good faith and fair dealing, unjust enrichment, quantum meruit, assault, battery, intentional infliction of emotional distress, tort or any other theory under the common law of any state); for stock, stock options, unit options, units, incentive units, restricted stock units or any other equity interests or rights to acquire equity interests in the Company or any other Releasee; and for damages or other remedies of any sort, including, without limitation, compensatory damages, punitive damages, injunctive relief and attorney's fees.

Notwithstanding the foregoing, this general release does not release any Claim: (a) that arises after the Revocation Period, including any rights that may arise under the Equity Documents; (b) for unemployment or workers' compensation benefits; (c) for vested rights under ERISA-covered employee benefit plans as applicable on the date you sign this Agreement; (d) for coverage under any officer, director, or executive indemnification agreement (the "*Indemnification Agreement*") and under applicable directors and officers liability insurance for acts or omissions while serving as an officer of the Company; (e) under this Agreement or (f) that by law cannot be waived. You agree not to accept damages of any nature, other equitable or legal remedies for your benefit, or attorney's fees or costs from any of the Releasees concerning any Claim released by this Agreement. As a material

inducement to the Company to enter into the Agreement, you represent that you have not assigned any Claim to any third party and that you have not filed any complaints, charges, applications, lawsuits, or arbitrations against the Company or any of the Releasees. To the extent that you have knowledge concerning a potential violation of any federal, state, or local law, you represent that you have fully disclosed such information to the Company as of the Effective Date of this Agreement.

You covenant not to sue the Company and/or the Releasees for any of the Claims released above, agree not to participate in any class, collective, representative, or group action that may include any of the Claims released above, and will affirmatively opt out of any such class, collective, representative, or group action. You agree not to participate in, seek to recover in, or assist in any litigation or investigation by other persons or entities against the Company and/or the Releasees, except as required by law.

Waiver of Unknown Claims. The Parties acknowledge the language of Section 1542 of the California Civil Code, which provides:

> "A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS THAT THE CREDITOR OR RELEASING PARTY DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE AND THAT IF KNOWN BY HIM OR HER, WOULD HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR OR RELEASED PARTY."

The Parties expressly waive the protection of Section 1542 and understand and agree that claims or facts in addition to or different from those which are now known or believed by them to exist may be discovered. The Parties intend to settle fully and release all claims they now have against one another and by you against the Company and the other Releasees, whether known or unknown, suspected, or unsuspected, except as to claims that cannot lawfully be released.

4. Cooperation. You agree that, to the maximum extent permitted by law, you have not and shall not in any way voluntarily assist, aid, or participate in the pursuit of any claims or actions brought by another against the Company or Releasees. If your assistance is requested or required in the pursuit of any claims brought against the Company or Releasees, you agree to provide written notice to the Company within two (2) business days of such request, unless requested by a governmental authority to the contrary. Without additional compensation, you agree to cooperate with the Company and Releasees (including its and their counsel) in investigating, defending, prosecuting, litigating, filing, initiating, or asserting any actual or potential claims or other matters involving the Company and Releasees. You agree to make yourself available during and outside of regular business hours for such cooperation; *provided* that the Company shall not utilize this Section to require you to make yourself available to an extent that would unreasonably interfere with any subsequent professional responsibilities that you may have. You agree to appear without the necessity of a subpoena to testify truthfully in any legal proceedings in which the Company calls you as a witness. In connection with fulfilling your obligations under this section, pre-approved, out-of-pocket reasonable expenses will be reimbursed by the Company, which shall not include any attorneys' fees, except as provided by the Company's by-laws and/or applicable insurance policies.

5. Return of Company Property. You agree not to dispose of any property of the Company including, without limitation, information, or documents (including, without limitation, computerized data and any copies made of any computerized data or software) (all the foregoing are collectively referred to as the "*Documents*") without the prior written authorization of the Company. On or before the Last Day Worked, you shall return to the Company all property of the Company, including, without limitation, computer equipment, electronic devices, iPads, iPhones, mobile devices, software, access cards, credit cards, files, and any Documents containing information concerning the Company, and its actual or prospective business or business relationships. After

returning all Documents and property of the Company, you shall delete and purge any duplicates of files or documents that may contain Company information from any non-Company computer or other devices that remain in your property. If you discover that you continue to retain any such property, you shall return it to the Company or destroy it immediately.

6. Non-disparagement.

(a) Subject to Section 7 below, you agree not to make any false, disparaging, critical, or detrimental statements concerning the Company or any of the Releasees; its or their products or services provided or to be provided; its or their current or former officers, directors, stockholders, members, employees, managers, or agents; and its or their business affairs or financial condition. You further agree not to take any actions or conduct yourself in any way that would reasonably be expected to affect adversely the reputation or goodwill of the Company or its affiliates; or its or their products or services provided or to be provided; or its or their current or former officers, directors, stockholders, members, employees, managers, or agents. This non-disparagement obligation shall not in any way affect your obligation to testify truthfully in any legal proceeding.

(b) The Company agrees that each of the members of the Company's current Executive Committee will not make any false, disparaging, critical, or detrimental statements concerning your employment with the Company or take any actions that would reasonably be expected to affect adversely your professional reputation. This non-disparagement obligation shall not in any way affect any Executive Committee member's obligation to perform their fiduciary duties for the Company or testify truthfully in any legal or administrative proceeding.

(c) You agree to limit any communications regarding your transition to statements that are consistent with the Company's prior and contemporaneous announcement on or before the Last Day Worked.

7. Protected Disclosures. Nothing contained in this Agreement (including, without limitation, the Restrictive Covenants Agreement) limits your ability to file a charge or complaint with any federal, state, or local governmental agency or commission (a "*Government Agency*"). In addition, nothing contained in this Agreement limits your ability to communicate with any Government Agency or otherwise participate in any investigation or proceeding that may be conducted by any Government Agency, nor does anything contained in this Agreement apply to truthful testimony in litigation. If you file any charge or complaint with any Government Agency and if the Government Agency pursues any claim on your behalf, or if any other third party pursues any claim on your behalf, you waive any right to monetary or other individualized relief (either individually or as part of any collective or class action); *provided however* that nothing in this Agreement limits any right you may have to receive a whistleblower award or bounty for information provided to the Securities and Exchange Commission. Nothing in this Agreement (including, without limitation, the Restrictive Covenants Agreement) is intended to conflict with 18 U.S.C. § 1833(b), which provides that: "An individual shall not be held criminally or civilly liable under any Federal or State trade secret law for the disclosure of a trade secret that (A) is made (i) in confidence to a Federal, State, or local government official, either directly or indirectly, or to an attorney; and (ii) solely for the purpose of reporting or investigating a suspected violation of law; or (B) is made in a complaint or other document filed in a lawsuit or other proceeding, if such filing is made under seal."

8. Tax Treatment. The Company shall undertake to make deductions, withholdings, and tax reports with respect to payments and benefits under this Agreement to the extent that it reasonably and in good faith determines that it is required to make such deductions, withholdings, and tax reports. Nothing in this Agreement shall be construed to require the Company to make any payments to compensate you for any adverse tax effects incurred because of the Transition Benefits.

9. Section 409A.

(a) The parties intend that this Agreement will be administered in accordance with Section 409A of the Internal Revenue Code of 1986, as amended (the "*Code*"). To the extent that any provision of this Agreement is ambiguous as to its compliance with Section 409A of the Code, the provision shall be read in such a manner so that such payments comply with, or are exempt from, Section 409A of the Code. The parties agree that this Agreement may be amended, as reasonably requested by either party, and as necessary to fully comply with, or be exempt from, Section 409A of the Code and all related rules and regulations.

(b) Anything in this Agreement to the contrary notwithstanding, if at the time of your separation from service within the meaning of Section 409A of the Code you are a "specified employee" within the meaning of Section 409A(a)(2)(B)(i) of the Code, then to the extent any payment or benefit that you become entitled to under this Agreement on account of your separation from service would be considered deferred compensation otherwise subject to the twenty percent (20%) additional tax imposed under Section 409A(a) of the Code, such payment shall not be payable and such benefit shall not be provided until the date that is the earlier of (A) six months and one day after your separation from service, or (B) your death. If any such delayed cash payment is otherwise payable on an installment basis, the first payment shall include a catch-up payment covering amounts that would otherwise have been paid during the six-month period but for the application of this provision, and the balance of the installments shall be payable under their original schedule.

(c) To the extent that any payment or benefit described in this Agreement constitutes "nonqualified deferred compensation" under Section 409A of the Code, and to the extent that such payment or benefit is payable upon your separation of employment, then such payments or benefits shall be payable only upon your "separation from service." The determination of whether and when a separation from service has occurred shall be made following the presumptions outlined in Treasury Regulation Section 1.409A-1(h).

(d) The Company makes no representation or warranty and shall have no liability to you or any other person if any provisions of this Agreement are determined to constitute deferred compensation subject to Section 409A of the Code but do not satisfy an exemption from, or the conditions of, such Section.

10. No Liability. This Agreement shall not be construed as an admission of any liability by the Company or you of any act of wrongdoing. The Parties specifically disclaim that the Company or any of the Releasees has engaged in any wrongdoing or has taken any action that would be the basis for any finding of liability.

11. Enforceability. Except for the General Release of Claims above, if any portion or provision of this Agreement (including, without limitation, any portion or provision of the Restrictive Covenants Agreement) shall to any extent be declared illegal or unenforceable by a court of competent jurisdiction, then the remainder of this Agreement, or the application of such portion or provision in circumstances other than those as to which it is so declared illegal or unenforceable shall not be affected, and each portion and provision shall be valid and enforceable to the fullest extent permitted by law. If the General Release of Claims is found to be invalid or unenforceable in whole or in part, the Company will have the option in its sole discretion either to sever the invalid or unenforceable portion and enforce the rest of the Agreement or to cancel the entire Agreement. In the event the Company exercises the option to cancel the entire Agreement, the Agreement shall be null and void and none of the Transition Benefits shall be owing, paid, or provided, and if such amounts or benefits have been paid or provided, you shall repay to the Company the total gross amount or value of any such benefits already paid or provided, and the total gross amount of the amounts otherwise being waived.

12. Effect of Breach. If you fail to comply with any of your obligations under this Agreement (including the obligations under the Restrictive Covenants Agreement), in addition to any other legal or equitable remedies it may have for such breach, including for damages and equitable relief, the Company shall have the right to (i) if you are still employed, end your employment for Cause, (ii) terminate its payments to you under the Agreement; and/or (iii) seek recovery of any payments made to you or for your benefit under this Agreement. Any such consequences of a breach by you will not affect the release or your continuing obligations under this Agreement or under the Restrictive Covenants Agreement.

13. Waiver; Amendment. No waiver of any provision of this Agreement shall be effective unless made in writing and signed by the waiving party. The failure of any party to require the performance of any term or obligation of this Agreement, or the waiver by any party of any breach, shall not prevent any subsequent enforcement of such term or obligation or be deemed a waiver of any subsequent breach. This Agreement may not be modified or amended except in a writing signed by both you and an authorized Company executive.

14. Forum; Relief, Interpretation.

(a) The Parties agree that Massachusetts federal courts shall have the exclusive jurisdiction to consider any matters related to this Agreement, including without limitation any claim for violation of this Agreement. With respect to any such court action, you (i) submit to the personal jurisdiction of such court, (ii) consent to service of process, and (iii) waive any other requirement (whether imposed by statute, rule of court, or otherwise) with respect to personal jurisdiction or venue. This Agreement shall be construed under the laws of the Commonwealth of Massachusetts, without giving effect to any conflict of law provisions that would cause the application of the laws of other jurisdictions.

(b) The Parties agree that this Agreement shall not be construed more strictly against one party than another because it may have been prepared in whole or in part by one of the Parties. The Agreement's headings are for reference purposes only and shall not affect its meaning or interpretation. References to agreements and other documents shall be deemed to include all subsequent amendments and other modifications. References to statutes shall include all associated regulations or amendments.

(c) You agree that it would be difficult to measure the harm caused to the Company that might result from any breach by you of your promises outlined in this Agreement and that money damages would be an inadequate remedy for any such breach. Accordingly, you agree that if you breach, or propose to breach, any of your obligations under this Agreement, the Company shall be entitled, in addition to all other remedies, to an injunction or other appropriate equitable relief without showing or proving any actual damage to the Company and without the necessity of posting a bond.

15. Entire Agreement. This Agreement constitutes the entire agreement between you and the Company and supersedes any previous agreements or understandings between you and the Company, including the June 2, 2020, Offer of Employment, *provided however* that the ESP, Indemnification Agreement, Restrictive Covenants Agreement, and Equity Documents remain in full force and effect.

16. Time for Consideration; Effective Date. You acknowledge that you have been given the opportunity to consider this Agreement for at least 21 calendar days before signing it (the "*Consideration Period*"). Any changes to this Agreement, material or otherwise, will not restart the running of the Consideration Period. In signing this Agreement, you acknowledge that you have knowingly and voluntarily entered into this Agreement without any undue influence on the part of the Company or any of the Releasees. You acknowledge that the General Release of Claims is knowing and voluntary, including without implication of limitation all claims under the Age

Discrimination in Employment Act, 29 U.S.C. § 621 et seq. If you sign this Agreement before the end of the Consideration Period, you acknowledge that such decision was voluntary and that you had the opportunity to consider this Agreement for the entire Consideration Period. You have seven (7) business days following your execution of this Agreement to revoke your assent by written notice to me (such period, the "*Revocation Period*"). For a revocation to be effective, it must be received by me on or before the expiration of the Revocation Period. This Agreement shall become effective only as of the first (1st) business day after the expiration of the Revocation Period (the "*Effective Date*"). If you do not enter into this Agreement, your retirement will still be effective, but you will not be entitled to all the Transition Benefits. You are advised to consult with an attorney before executing this Agreement.

17. Counterparts. This Agreement may be executed in two counterparts, each of which shall be considered an original and all of which shall constitute one agreement. The signatures may be delivered by DocuSign or by scanned image (e.g., .pdf or .tiff file extension name) as an attachment to an electronic mail (e-mail), and such electronic signature shall be treated in all respects as having the same effect as an inked signature.

To accept this Agreement, please return a signed, unmodified counterparty of this Agreement to me on or before the expiration of the Consideration Period. By signing below, you acknowledge that you have been advised to discuss all aspects of this Agreement with your attorney, that you have carefully read and fully understand all the provisions of this Agreement, and that you are voluntarily entering into this Agreement.

Thank you for your contributions to the Company and its mission of delivering on the promise of mRNA science to create a new generation of transformative medicines for patients.

ModernaTX, Inc., by:

/s/ Tracey Franklin
Tracey Franklin
Chief Human Resources Officer

The foregoing is agreed to and accepted by:

David Meline

/s/ David Meline
Signature

10 April 2022
Date

Certain confidential portions of this exhibit have been omitted and replaced with "[***]." Such identified information has been excluded from this exhibit because it (i) is not material and (ii) is the type of information that the registrant treats as private or confidential.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT	1. CONTRACT ID CODE	PAGE OF PAGES 1 11

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
P00012	See Block 16C		

6. ISSUED BY CODE	ASPR-BARDA	7. ADMINISTERED BY (If other than item 6) CODE	ASPR-BARDA02
ASPR-BARDA 200 Independence Ave., S.W. Room 640-G Washington DC 20201		US DEPT OF HEALTH & HUMAN SERVICES ASST SEC OF PREPAREDNESS & RESPONSE ACQ MANAGEMENT, CONTRACTS, & GRANTS O'NEILL HOUSE OFFICE BUILDING Washington DC 20515	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
MODERNATX, INC. 1492235 Attn: [***] MODERNATX, INC. 200 TECHNOLOGY SQ CAMBRIDGE MA 02139-3578	X	9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MOD. OF CONTRACT/ORDER NO. 75A50120C00034
CODE 1492235 FACILITY CODE		10B. DATED (SEE ITEM 13) 04/03/2020

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer is extended, ☐ is not extended.

Offer mist acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

See Schedule

Net Increase: $308,495,451.00

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation data, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*
X	FAR 43.103(a)

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 1 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Tax ID Number: 27-0226313 DUNS Number: 069723520

The purpose of this "no cost" bilateral modification is to:

The purpose of this modification is to

1) Provide funding in CLIN 0004 to support the additional scope of the Clinical Development Plan for the Adolescent Study P203 (WBS 1.4.2.3), Pediatric Study P204 (WBS 1.4.2.4) and Phase 3 Pivotal Study P301 (WBS 1.4.3.1) and

2) Update Section G.8 Negotiated Indirect Rates and Ceiling.

All other terms and conditions remain unchanged.

Continued ...

Except as provided herein, all terms and conditions of the document referenced in Item 9 A or 10A, as heretofore changed, remains unchanged and in full force and effect .

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
[***]		[***]	
15B. CONTRACTOR/OFFEROR [***] *(Signature of person authorized to sign)*	15C. DATE SIGNED 3/23/2022	16B. UNITED STATES OF AMERICA [***] *(Signature of Contracting Officer)*	16C. DATE SIGNED 2022.03.23

NAME OF OFFEROR OR CONTRACTOR
MODERNATX, INC 1492235

ITEM NO. (A)	SUPPLIES/SERVICES (B)	QUANTITY (C)	UNIT (D)	UNIT PRICE (E)	AMOUNT (F)
	Period of Performance: 04/03/2020 to 08/31/2023 Add Item 4 as follows:				
4	CLIN 0004 - Additional scope for the Adolescent Study P203 (WBS 1.4.2.3), Pediatric Study P204 (WBS 1.4.2.4) and Phase 3 Pivotal Study P301 (WBS 1.4.3.1) Requisition No: OS290293, OS290310 Accounting Info: 2022.199C035.25103 Appr. Yr.: 2022 CAN: 199C035 Obj Class: 25103 Funded:$137,493,755.00 Accounting Info: 2022.199C092.25103 Appr. Yr.: 2022 CAN: 199C092 Obj Class: 25103 Funded: $171,001,696.00				308,495,451.00

The purpose of this modification is to:

1) Provide funding to support the additional scope of the Clinical Development Plan for the Adolescent Study P203 (WBS 1.4.2.3), Pediatric Study P204 (WBS 1.4.2.4) and Phase 3 Pivotal Study P301 (WBS 1.4.3.1) and
2) Update Section G.8 Negotiated Indirect Rates and Ceiling.

The chart below shows the budget increase to support the additional scope for the Adolescent Study P203 (WBS 1.4.2.3), Pediatric Study P204 (WBS 1.4.2.4) and Phase 3 Pivotal Study P301 (WBS 1.4.3.1) in the total amount of $[***]. BARDA will fund $308,495,451 and Moderna will contribute $[***].

Contract Modification Scope	Moderna % Share	BARDA % Share	Total	Total Budget Increase	Moderna Amount	BARDA Amount (NTE)
P203 Expansion	[***]%	[***]%	100%	$ [***]	$ [***]	$ -
P204 Expansion	[***]%	[***]%	100%	$ [***]	$ [***]	$ 137,493,755
P301 Boost	[***]%	[***]%	100%	$ [***]	$ [***]	$ 171,001,696
Total				**$ [***]**	**$ [***]**	**$ 308,495,451**

– BARDA's funding is a Not-To-Exceed (NTE) in the amount of $308,495,451 which is based on funding
  • **P203 – [***]%; P204 – [***]% and P301 – [***]%**

– Moderna's contributions are **solely and specifically for the increase in scope captured in Modification 12. Moderna will contribute $[***] based on the following percents.**
  • **P203 – [***]%; P204 – [***]% and P301 – [***]%**

Below is the CLIN Structure as a result of this request (Modification 12). CLIN 0004 will fund BARDA's portion of the additional scope for the Adolescent Study P203, Pediatric Study P204, and Phase 3 Pivotal Study P301.

CLIN WBS Description
0002 Clinical 1.4.2.3 P203 Adolescent Study age 12 years to < 18 years.
0002 Clinical 1.4.2.4 P204 Pediatrics children aged 6 months to < 12 years.
0002 Clinical 1.4.3.1 P301 Phase 3 Pivotal Study
****0004 Revised Scope Mod 12 Moderna/USG Contribution**

** CLIN 0004 was set up to fund the additional/revised scope of the Adolescent Study P203, Pediatric Study P204, and Phase 3 Pivotal Study P301. This modification was negotiated such that BARDA's funding will not exceed $308,495,451. Any costs incurred in excess of the agreed-upon Not-To-Exceed (NTE) amount of $308,495,451 would **not** be billable under this contract and will be borne by Moderna unless separately agreed by both parties.

Moderna will continue to invoice allowable cost against CLIN 0002 until the funding on CLIN 0002 is fully exhausted. At that time, Moderna will begin allocating costs to CLIN 0004, with BARDA contributions not to exceed $308,495,451.

CLIN 0004 will remain CPFF. Fee will not be applied to the additional scope. CLIN 0004 POP will commence upon the exhaustion of CLIN 0002 funding and end 8/31/2023.

The chart below summaries the modifications on this contract. As a result of this modification, the contract value increased from $1,398,105,892 to $1,706,601,343.

DATE	MOD NO.	TYPE/PURPOSE OF MODIFICATION	CONTRACT VALUE CHANGE	CUMULATIVE CONTRACT VALUE
4/16/2020	Basic	Basic Award	$430,298,520	$430,298,520
5/24/2020	P00001	Exercise Option 1 CLIN 0003	$53,000,000	$483,298,520
7/25/2020	P00003	Increased SOW	$471,596,459	$954,894,979
8/31/2020	P00004	Add DPAS Priority Language	$0	$954,894,979
9/14/2020	P00005	Realign SOW in CLIN 0002 $48M	$0	$954,894,979
2/16/2021	P00006	Transfer vials to CDC	$0	$954,894,979
3/12/2021	P00007	P201, P203 & Program Management	$62,705,357	$1,017,600,336
4/18/2021	P00008	P301	$236,364,615	$1,253,964,951
6/15/2021	P00009	P204 & Press Release Update	$144,140,941	$1,398,105,892
9/8/2021	P00010	Rescind DPAS & update Section H.3 Key Personnel	$0	$1,398,105,892
11/5/2021	P00011	52.223-99 Ensuring Adequate COVID-19 & Update FY 21 Indirect Rates	$0	$1,398,105,892
	P00012	**P203, P204, P301 & Indirect Rates**	**$308,495,451**	**$1,706,601,343**

Section G.8 Negotiated Indirect Rates and Ceiling are revised as follows:

(a) Pending the establishment of final indirect cost rates, which shall be determined annually, based on audit of actual costs as provided in Subparts 31.201-6, 42.7 and 52.216-7(d) of the Federal Acquisition Regulation, the Contractor shall be reimbursed for allowable indirect costs at the approved agreed upon provisional billing rates. The Contractor's audited final indirect costs are allowable, to the extent that they do not lead the Contractor to exceed the established total contract cost or the Ceiling Rates established under this contract. If the Contractor's final indirect cost rates are less than the established ceiling rates, the Contractor shall issue a credit for the difference between the ceiling rates and the lower final rates and update billings within 60 days after settlement of final indirect cost rates. The Contractor is also directed to the requirement to provide the USG with notice, when that actual costs are expected to exceed the costs estimates, as required by FAR 52.232-20

(b) The contractor is responsible for tracking all costs during performance, including indirect costs, and providing all required notices.

The Chart Below Shows the Indirect Ceiling Rates

Indirect Cost Pool	Provisional Billing Rate / Allocation Base	2020 Rate Ceiling NTE
Fringe	[***]% of Total Labor Dollars	[***]%
Tech. Dev. Overhead	[***]% of Tech Dev Direct Labor Dollars and Allocated Fringe Dollars	[***]%
Research Overhead	[***]% of Research Direct Labor Dollars and Allocated Fringe Dollars	[***]%
Development Overhead	[***]% of Development Direct Labor Dollars and AllocatedFringe Dollars	[***]%
G&A	[***]% of Total Cost Input	[***]%

(c) The Government is not obligated to reimburse the Contractor for costs incurred in excess of the cost established in the contract.

C. Statement of Work

Updated with Modification P000012
The contractor shall furnish all necessary services, qualified professional, technical, and administrative personnel, material, equipment and facilities as needed to perform the tasks set forth below that are not otherwise provided by the Government under the terms of this contract.

mRNA-1273 Vaccine Development (WBS 1.0)
The Contractor, Moderna, Inc. ("Moderna") shall execute the preclinical, clinical, and chemistry, manufacturing and controls (CMC) activities required to license a vaccine against the SARS-CoV-2 virus (hereafter referred to as "mRNA-1273"). Building upon early clinical development already underway, this proposal will support the late stage development, including the demonstration of clinical efficacy and generation of a dataset supportive of licensure. Moderna will additionally evaluate the platform manufacturing capabilities relative to the needs for supply in response to a pandemic.

Program Management (WBS 1.1)
mRNA-1273 Program Management (WBS 1.1.1)
Moderna's mRNA-1273 program team is composed of a multidisciplinary, highly matrixed, group of functional leads with experience in, and responsibility for, integrating plans and operationalizing strategies across Research, Toxicology, CMC, Regulatory Affairs, Clinical Development, and Quality. Collectively, the team has advanced ten programs to first-in-human studies within five years. The group will be led by a program lead (PL) who will oversee and coordinate the activities necessary to meet the program objective of licensure. The PL will be the point of accountability for the development and deployment of mRNA-1273. The Principal Investigator will set the strategic objectives for the program and ensure that Moderna is prepared to license a vaccine as early as the end of 2020. The Sub Principal Investigator will be responsible for ensure sufficient manufacturing capacity and production of mRNA-1273. A program management office (PMO) will be responsible for managing the cost and schedule constraints of the contract via an integrated master schedule and corresponding budget, identifying and managing program risk, and ensuring contract compliance. With the input from the mRNA-1273 project team, the PMO will be responsible for coordinating the drafting of and management to an integrated development plan. Upon execution of the contract, weekly meetings with BARDA will be held to monitor program performance and monthly and annual reports will be will delivered to BARDA for the record.

Nonclinical Toxicology (WBS 1.2)
Development and Reproductive Toxicology of mRNA-1273 (WBS 1.2.2.1)
To assess the risk of administering the vaccine to pregnant women, a complete GLP rat developmental and reproductive toxicology (DART) study is planned. Female Sprague Dawley rats will be dosed at the highest anticipated clinical dose level and include a control arm of phosphate-buffered saline (PBS). As is typical for DART evaluations for vaccines, the animals will be immunized three times prior to mating and two times during gestation. Each group will have two cohorts (one group will undergo Cesarean section with examination of the uteri and embryos; the other group will have natural delivery and will be terminated at weaning).

Nonclinical (WBS 1.3)
For the purposes of this proposal it is assumed that the VRC continues to support nonclinical activities to develop murine and non-human primate efficacy studies, and animal models to assess the potential of vaccine-enhanced disease. The scope of work below will execute additional robustness experiments in these developed models.

Assess Disease Enhancement (WBS 1.3.3.1)
The CoV spike protein expressed by the mRNA-1273 vaccine is stabilized in the prefusion conformation which should be optimal for inducing high quality antibody responses with low binding antibody to neutralizing antibody ratios. mRNA delivery and induction of CD8 T cells and Th1 CD4 T cells will avoid Th2-biased responses. The SARS-CoV-2 S protein expressed by the mRNA-1273 vaccine is stabilized in the pre-fusion conformation which should be optimal for inducing high functional antibody responses with low binding antibody to neutralizing antibody ratios, as it has been seen in RSV DS-Cav1 clinical trials and 2P-stabilized CoV S animal studies. In addition, mRNA vaccines induce Th1 skewed response as has been evident in several pre-clinical and clinical vaccine programs at Moderna, including pandemic flu and CMV (PMID 28457665, 29456015). By expressing pre-fusion SARS-CoV-2 S delivered with mRNA we should induce CD8 T cells and Th1-biased CD4 T cell responses as shown in both human, NHP, and murine studies, thus avoiding a Th2-biased response.

We plan to perform studies in mouse and NHPs to assess the theoretical risk of vaccine induced disease enhancement triggered by CoV infection following vaccination with imRNA-1273. [***].

[***].

Ralph Baric is also developing a human ACE-2 transgenic mouse model, resulting in viremia and lung pathology upon wild- type SARS-CoV-2 infection. This model should facilitate evaluation of wild-type SARS-CoV-2 virus and will also be used to evaluation protection from mRNA-1273 vaccination. This model is however still under development and data are unlikely to become available before June/July 2020.

Finally, Vincent Munster (NIH/NIAID) has developed a Rhesus macaque model of SARS-CoV infection. After challenge animals get sick but infection is not lethal. Decreased respiration and irregular breathing, weight loss, fever spike at day 1 and evidence of pneumonia are all observed. In addition, hematological evidence of disease is seen, as well as viremia and shedding in nose, throat, and rectum up to day 10. Unlike what is observed clinically a high challenge dose of virus is required, and animals recover without intervention. Animals will be immunized with limiting doses of mRNA-1273 to allow breakthrough infection and endpoints relevant for disease enhancement will be collected. Results from these challenge studies may become available by end of June 2020.

Establish a Surrogate of Protection (WBS 1.3.3.2)
The primary endpoint for accelerated approval of a SARS-CoV-2 vaccine would be a neutralization assay. This endpoint must be supported with a body of pre-clinical work that demonstrates a correlation between neutralizing titers and efficacy and that quantifies a protective serologic threshold titer using the same neutralization assay. Murine and NHP efficacy models are being developed in parallel to the Phase 1 clinical study. Building on data from these preliminary models and studies, Moderna will conduct NHP efficacy and murine passive transfer studies to confirm and refine the surrogate of protection.

Clinical (WBS 1.4)
A Phase 1 study of mRNA-1273 in 120 healthy subjects 18-55 years of age will evaluate the safety and immunogenicity of two injections (28 days apart) at four dose levels (25, 50, 100 and 250 µg). The proposed Phase 2 study will enroll n=600 healthy subjects (>18 years) to receive two injections, 28 days apart, of placebo or 50 or 100 µg mRNA-1273, at 1:1:1, age stratified (18-55 yrs; >55 yrs).

The total safety database from the mRNA-1273 Phase 1 and Phase 2 studies will be approximately 445 adult participants exposed and approximately 245 adult participants at the highest dose level. The proposed Phase 2 study (synopsis included below) is intended to support entry to subsequent Phase 3 study(ies). [***].

Phase 2 Safety and Immunogenicity Study (WBS 1.4.2.1)
Immediately following dose selection in the initial Phase 1 study the program will initiate a Phase 2 clinical study. The P201 study will confirm the safety and immunogenicity results from the open-label Phase 1, again testing a two-dose administration series 28d apart. Its assumed that 600 participants, randomized 1:1:1 active: placebo, testing a two dose levels of mRNA-1273. Enrollment will be age-stratified participants 18 year of age and above into two age cohorts. Primary objectives will include standard clinical safety evaluation with conventional safety and SARS-CoV-2-specific IgG endpoints though a neutralizing antibody assay would be preferred if available. Secondary objectives will evaluate of the specific humoral response against SARS-CoV-2 by binding and neutralizing antibody (nAb) response. Safety will be followed through 6 months post-last vaccination and primary immunogenicity endpoint will be measured at D57. The study will enroll in the US under IND. The study will assess COVID-19 as exploratory endpoint which may extend the duration of follow-up accordingly. Clinical trial assessments will include measurement of SARS-CoV-2 S-specific binding antibody and neutralizing activity in sera. This will provide an indication of vaccine-induced antibody quality and relative potency. Historically, immune-complex mediated lung pathology has been associated with a high ratio of binding to functional antibody activity. In addition, vaccine-induced T cell responses will be evaluated by peptide pool stimulation to define the pattern of cytokine production. [***]. To support the EUA, an interim clinical study synopsis will be drafted based on D57 safety and immunogenicity data.

Adolescent Study (WBS 1.4.2.3) – Updated with Mod P00012 – P203

Moderna will conduct an initial pediatric study plan (PSP) under Pediatric Research Equity Act requirements during the IND phase. A deferral will be requested for children less than 6 months of age at the time of initial BLA approval. Having demonstrated the mRNA-1273 is safe, tolerated, and effective in adults, Moderna will test the safety and immunogenicity of mRNA-1273 in a pediatric population with an aged-based step-down design.

The P203 study is a Phase 2/3, randomized, observer-blind, placebo controlled, study to evaluate the safety, reactogenicity, and effectiveness of mRNA-1273 SARS-CoV-2 vaccine in ~~3000~~ 3,740 healthy adolescents 12 to < 18 years of age. Participants will be randomly assigned to receive injections of either 100 µg of mRNA-1273 vaccine or a placebo control in a 2:1 randomization ratio. The goal of the study is to seek an indication for use of mRNA 1273 (100 µg IM, given as 2 injections, 28 days apart) in the 12 to < 18 year age group. The basis for demonstrating vaccine effectiveness is proposed to be met by serum antibody (Ab) response measured in this adolescent age group. The approach to inferring vaccine effectiveness will depend on whether or not an accepted serum Ab threshold conferring protection against COVID-19 has been established. If an Ab threshold of protection has been established, effectiveness will be inferred based on the proportion of adolescent study participants with serum Ab levels (on study Day 57) meeting or exceeding the Ab threshold. If an Ab threshold of protection has not been established, effectiveness will be inferred based on demonstrating non-inferiority of the geometric mean value of serum nAb from adolescent participants compared to the geometric mean value of serum nAb from adults enrolled in the ongoing clinical endpoint efficacy trial (Study P301).

This adolescent study will monitor all participants for a total of 12 months following the second dose of vaccine or placebo. Safety assessments will include solicited ARs (7 days post each injection), unsolicited AEs (28 days post each injection), medically attended adverse events (MAAEs), serious adverse events (SAEs), and adverse event of special interest (AESI) (pediatric MIS C) throughout the study period. Upon authorization of a vaccine in this age group, participants will be invited to cross over into an Open-Label Part B at which time they will be informed of their vaccination status and participants originally randomized to placebo will be offered mRNA-1273.

Pediatrics (WBS 1.4.2.4) – Updated with Mod P00012 – P204

mRNA-1273-P204 is a Phase 2/3, 2-part, open-label, dose-escalation, age de-escalation, randomized, observer-blind, placebo- controlled, expansion study intended to infer the effectiveness of mRNA-1273 in children aged 6 months to < 12 years. The study population will be divided into 3 age groups (6 to < 12 years, 2 to < 6 years, and 6 months to < 2 years) and up to 3 dose levels (25, 50, and 100 µg) of mRNA-1273 will be evaluated.

The study will be conducted in 2 parts. Part 1 of the study will be open label and consist of dose-escalation, age de-escalation in 1,275 participants (see Table below for the number of participants in each age group) to select the dose for each age group. Part 2 of the study will be placebo-controlled, observer-blind evaluation of the selected dose in up to 12,000 participants (up to 4,000 participants in each age group). No participants in Part 1 will participate in Part 2 of the study.

The study will begin with the oldest age group (6 to < 12 year) and age de-escalate. Each age group will begin with Part 1 and advance to Part 2. The mRNA-1273 investigational vaccine or placebo will be administered as 2 intramuscular (IM) injections, approximately 28 days apart.

The mRNA-1273 dose levels that will be evaluated in each age group in Part 1 and Part 2 of the study are given in the Table below. The 6-month to < 2 yr and the 2 to <6 year old age groups will receive the 25 µg dose level.

Age Group	Part 1			Part 2	
	mRNA-1273 25 µg	mRNA-1273 50 µg	mRNA-1273 100 µg	Selected Dose Level of mRNA-1273 From Part 1	Placebo
6 to < 12years		Study Arm 1(n=375)	Study Arm 2(n=375)	Study Arm 8 (n= 3,000)50 µg	Study Arm 9(n= 1,000)
2 to < 6 years	Study Arm 7(Optional) (n=75)	Study Arm 3(n=75) Study Arm 4(n=75)		Study Arm 10 (n= up to 3,000) 25 µg	Study Arm 11(n=up to 1,000)
6 months to < 2 years	Study Arm 5(n=150)	Study Arm 6(n=150)		Study Arm 12 (n= up to 3,000) 25 µg	Study Arm 13(n=up to 1,000)

The study will enroll in the US and Canada.

Phase 3 Pivotal Study (WBS 1.4.3.1) – Updated with Mod P00012 – P301

Phase 3 Pivotal Study (WBS 1.4.3.1). The Phase 3 mRNA-1273-P301 study will confirm the trends observed during the Phase 1 and 2 trials, evaluating safety and efficacy in a larger number of subjects aged 18 and above. Approximately 30,000 subjects will be enrolled according to 1:1 randomization (active: placebo). Primary objectives will be 1) to demonstrate the efficacy of mRNA-1273 to prevent COVID-19 and 2) to evaluate the safety and reactogenicity of 2 injections of the mRNA-1273 vaccine given 28 days apart. Secondary objectives will evaluate: the efficacy of mRNA-1273 to prevent severe COVID-19; the efficacy of mRNA-1273 to prevent virologically confirmed SARS-CoV-2 infection or COVID-19 regardless of symptomatology or severity; VE against a broad definition of COVID-19 disease; VE to prevent death due to COVID-19 disease; VE against all- cause mortality; the efficacy of mRNA-1273 to prevent COVID-19 after the first dose of investigational product (IP); the efficacy of mRNA-1273 to prevent COVID-19 in all study participants, regardless of evidence of prior SARS-CoV-2 infection; the efficacy of mRNA-1273 to prevent asymptomatic SARS-CoV-2 infection.

The sample size of this Phase 3 is driven by the total number of cases to demonstrate VE (mRNA-1273 vs. placebo) to prevent COVID-19. [***].

[***].

On issuance of the EUA, in agreement with the FDA and OWS, the P301 study will offer vaccine to participants that were randomized to receive placebo and the study will transition to an open label study. All 30K participants will return for a Participant Decision Visit. Participants will complete an updated ICF, a sera and NP swab sample will be collected to test for asymptomatic infection, and participants randomized to the placebo arm will be offered vaccine. After unblinding the sponsor will continue to leverage the clinical trial infrastructure. Doubling the exposed population will reduce the incidence of rare events potentially detectable with high confidence in the trial to approximately 1/10,000 or 0.01%.

In anticipation of FDA authorization of booster vaccination in September 2021, Moderna offered a booster dose of 50 µg mRNA-1273 (in Part C of the trial) to the approximately 25,000 participants in P301. Part C will facilitate the retention of study participants and is being conducted with minimal disruption to the original study. Safety and immunogenicity of the booster as well as the impact of the booster on the incidence rates of COVID-19 in the mRNA 1273 and Placebo-mRNA 1273 groups will be evaluated.

Part C Visit 1 will include an optional NP swab. Post-dosing safety calls will include passive solicitation for myocarditis and pericarditis, and myocarditis and pericarditis adjudication committee (AC) will be included. Covid-19 surveillance and case reporting/AC will continue for all. Original SOA Safety Calls post M13 (V5) to drop from monthly to every 2 months.

An interim database lock to support an sBLA will occur based on data generated from Protocol Amendment 9 that cover the addition of boosting and associated data for all eligible subjects.

Lot to Lot Consistency (WBS 1.4.3.2)

Based on FDA feedback received on 27 Aug 2020 this study is no longer required for licensure.

Regulatory (WBS 1.5)
IND Preparation and Filing (WBS 1.5.1.1)
Moderna's Regulatory Affairs group, in close collaboration with BARDA, will work to draft a comprehensive regulatory master plan to guide the preclinical, CMC and clinical development of mRNA-1273 within the first 90 days of the contract. An original investigational new drug application (IND) will be filed with the United States Food and Drug Administration (FDA) to support the clinical development of the Moderna product from Phase 2 onwards.

IND Maintenance (WBS 1.5.1.2)
The Moderna-owned IND will be maintained to support the desired clinical development plan. As needed, meetings will be conducted to receive feedback and gain concurrence on the specifics of the development activities with the FDA. Moderna will file for Emergency Use Authorization, following the FDA guidance of EUA for COVID-19 vaccines. A product-specific VRBPAC will be held.

BLA Submission (WBS 1.5.2.1)
Moderna will submit a Biologics License Application (BLA) and seek approval for the mRNA-1273 vaccine.

CMC (WBS 1.6)
CTM Manufacture for Phase 2 (WBS 1.6.3.2)
Clinical trial materials for the P201 study will be supplied using the AMP process. The target yield of each lot is approximately [***] vials; consequently, manufacture of up to five drug product (DP) lots is expected to deliver [***] total vials. The DP will be a frozen liquid stored at [***]. The DP vials will be labeled and packaged by Moderna to support clinical testing in the US.

Process Development for Late Stage Clinical Supply (WBS 1.6.3.3) mRNA Process Development
Technical Development will confirm and optimize the process parameters for mRNA manufacture. [***].

[***].

BLA Readiness (WBS 1.6.3.8)
In support of the Biologics License Application (BLA) due to the nature of the proposed timeline, it is likely that Moderna will need to complete some of process validation activities, primarily process characterization, after the completion of process performance qualification and before BLA filing. Moderna intends to rapidly develop a robust process for clinical manufacturing and PPQ, and then fully describe the acceptable design space for the process prior to BLA filing. Other activities to support this BLA filing, such as completing raw material qualification activities; if not included in the BLA

submission, will require a supplement to the initial BLA. In the initial BLA filing Moderna will describe its control strategy to cover the gap between initial BLA filing and the BLA supplement.

Process Development for Full Commercial Scale (WBS 1.6.4.1)
The following section outlines the process development activities [***]. The goal of this work is to demonstrate the capability to produce mRNA-1273 at a scale that can support clinical demand.

[***].

Controls (Analytical and Validation) (WBS 1.6.5)

Potency Assay Development and Implementation (WBS 1.6.5.1)
[***].

Analytical Method Development and Validation (WBS 1.6.5.2)
Moderna has established a set of analytical methods that are applied to the release and stability testing of intermediates and DP. These methods are sufficient to assure the identity, strength, quality, purity and potency of the final product, and will have been qualified for use for mRNA-1273 as part of the Phase 2 CTM campaign. Robustness of product release and stability methods, structural characterization and identification of impurities to further support product specifications, product comparability assessment will continue to support Phase 3 development and licensure.

Characterization Assay Development and Implementation (WBS 1.6.5.3)
A heightened characterization panel of analytical techniques will be used to assess any process modifications and to confirm process reproducibility for both drug substance and drug product during process development and scale up. As the applicability of the methods used in the heightened panel to elucidate quality attributes of drug substance and drug product is determined, these methods may be elevated to the respective release panel.

Stability Studies (WBS 1.6.5.4)
Throughout the program, many studies will be undertaken [***]. This includes studies using development bench scale material, engineering lot material, and GMP material. This body of data will be used to apply interim and long-term shelf life to the drug product and process intermediates.

Exhibit 10.5

Certain confidential portions of this exhibit have been omitted and replaced with "[***]." Such identified information has been excluded from this exhibit because it (i) is not material and (ii) is the type of information that the registrant treats as private or confidential.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 5

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
P00022	28-Mar-2022	SEE SCHEDULE	

6. ISSUED BY	CODE	7. ADMINISTERED BY (If other than item 6)	CODE
ACC-APG - COVID RESPONSE - W58P05 6472 INTEGRITY COURT (BUILDING 4401) ABERDEEN PROVING GROUND MD 21005-3013	W58P05	DCMA BOSTON 495 SUMMER STREET BOSTON MA 02210-2138	S2206A

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
MODERNA US, INC. [***] 200 TECHNOLOGY SQ CAMBRIDGE MA 02139-3578		9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MOD. OF CONTRACT/ORDER NO. W911QY20C0100
CODE 8PTM0 FACILITY CODE	X	10B. DATED (SEE ITEM 13) 09-Aug-2020

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer is extended, is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods:
(a) By completing Items 8 and 15, and returning copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN
REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
See Schedule

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT S/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

X	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. FAR 52.243-1 Changes--Fixed Price
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor X is not, is required to sign this document and return copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
Modification Control Number: [***]
See Block 14 Continuation Page

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)
	[***] TEL: [***] EMAIL: [***]

15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		BY [***] (Signature of Contracting Officer)	28-Mar-2022

EXCEPTION TO SF 30
APPROVED BY OIRM 11-84

30-105-04

STANDARD FORM 30 (Rev. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text: P00022

OBLIGATION AMOUNT: $26,000,000

a. The purpose of this modification (P00022) is to:

(1) Issue an Unpriced Change Order (UCO) for the alignment of Product C Seasonal Boost/Pediatric Primary Series to support use for the age group of 6 months to <6 years (6m-<6y). Final revisions to the Statement of Work, Terms and Conditions, and Price will be established through the definitization process.

(2) Upon execution of this modification, Contractor is directed to take necessary steps to deliver at least [***] doses of Product C, as defined in H.19, that are labeled for use in pediatric primary series for the age group of 6 months to <6 years.

(3) Creates CLIN 5000 for the alignment of Product C from Seasonal Boost to Pediatric Primary Series for the age group of 6 months to <6 years (6m-<6y) per section H.19.

(4) Funds CLIN 5000 for $26,000,000, 50% of the not-to-exceed (NTE) price of $52,000,000, in accordance with DFARS 243.204-70-4.

(5) Add FAR Clause 52.216-24, Limitation of Government Liability; See clause in full text for additional details.

(6) Add DFARS Clause 252.217-7027, Contract Definitization; See clause in full text for additional details.

b. This modification was requested by the program office to meet the Government's COVID-19 National Response Strategy.

c. The total value contract has increased by $52,000,000 from $8,145,794,804.60 to $8,197,794,804.60. The total funded amount has increased by $26,000,000 from $8,145,794,804.60 to $8,171,794,804.60

All other terms and conditions remain unchanged.

SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by $52,000,000.00 from $8,145,794,804.60 to $8,197,794,804.60.

SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 5000 is added as follows:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
5000		1	Each	$52,000,000.00	$52,000,000.00 NTE

Product C Realignment to Pediatric 6m<6y
FFP
Receipt of this UCO constitutes your Notice to Proceed. The Not-to-Exceed (NTE) Ceiling Price for the UCO is $52,000,00 which $26,000,000 is obligated at the time of modification. Moderna is not authorized to expend any funds in excess of the above obligation limits. A Firm Fixed Price contract modification is contemplated. See Section I for the Definitization Schedule IAW DFARS CLAUSE 252.217-7027.
FOB: Destination
PSC CD: 6505

NET AMT $52,000,000.00

SUBCLIN 500001 is added as follows:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
500001					$0.00

50% of NTE Amount FFP
PURCHASE REQUEST NUMBER: 0011770238

NET AMT $0.00

ACRN AQ
CIN: GFEBS001177023800001

$26,000,000.00

SECTION E - INSPECTION AND ACCEPTANCE

The following Acceptance/Inspection Schedule was added for CLIN 5000:

INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
Destination	Government	Destination	Government

The following Acceptance/Inspection Schedule was added for SUBCLIN 500001:

INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
N/A	N/A	N/A	N/A

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation Summary for the

Payment Office

As a result of this modification, the total funded amount for this document was increased by $26,000,000.00 from $8,145,794,804.60 to $8,171,794,804.60.

SUBCLIN 500001:

Funding on SUBCLIN 500001 is initiated as follows: ACRN: AQ

CIN: GFEBS001177023800001

Acctng Data: 021202220232040000066565426O S.0074658.7.3.8 6100.0152021001

Increase: $26,000,000.00 Total:

$26,000,000.00

Cost Code: A5XAH

SECTION I - CONTRACT CLAUSES

The following have been added by full text:

52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding $8,197,794,804.60 dollars.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is $8,197,794,804.60 dollars.

(End of clause)

252.217-7027 CONTRACT DEFINITIZATION (DEC 2012)

(a) A Unprice Change Order (UCO) is contemplated. The Contractor agrees to begin promptly negotiating with the Contracting Officer the terms of a definitive contract that will include (1) all clauses required by the Federal Acquisition Regulation (FAR) on the date of execution of the undefinitized contract action, (2) all clauses required by law on the date of execution of the definitive contract action, and (3) any other mutually agreeable clauses, terms, and conditions. The Contractor agrees to submit fixed-price proposal and pricing data supporting its proposal.

(b) The schedule for definitizing this contract is as follows (insert target date for definitization of the contract action and dates for submission of proposal, beginning of negotiations, and, if appropriate, submission of the make-or-buy and subcontracting plans and certified cost or pricing data).

UCA Issued: 28 March 2022

Receipt of Qualifying Proposal: 1 April 2022
Beginning of Negotiations: 15 April 2022
Complete Negotiations: 29 April 2022
Definitization of UCO: 13 May 2022

(c) If agreement on a definitive contract action to supersede this undefinitized contract action is not reached by the target date in paragraph (b) of this clause, or within any extension of it granted by the Contracting Officer, the Contracting Officer may, with the approval of the head of the contracting activity, determine a reasonable price or fee in accordance with subpart 15.4 and part 31 of the FAR, subject to Contractor appeal as provided in the Disputes clause. In any event, the Contractor shall proceed with completion of the contract, subject only to the Limitation of Government Liability clause.

(1) After the Contracting Officer's determination of price or fee, the contract shall be governed by--

(i) All clauses required by the FAR on the date of execution of this undefinitized contract action for either fixed- price or cost-reimbursement contracts, as determined by the Contracting Officer under this paragraph (c);

(ii) All clauses required by law as of the date of the Contracting Officer's determination; and

(iii) Any other clauses, terms, and conditions mutually agreed upon.

(2) To the extent consistent with paragraph (c)(1) of this clause, all clauses, terms, and conditions included in this undefinitized contract action shall continue in effect, except those that by their nature apply only to an undefinitized contract action.

(d) The definitive contract resulting from this undefinitized contract action will include a negotiated firm-fixed price in no event to exceed $8,197,794,804.60.

(End of clause)

(End of Summary of Changes)

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 6

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO.(If applicable)
P00023	14-Apr-2022	SEE SCHEDULE	

6. ISSUED BY CODE	W58P05	7. ADMINISTERED BY (If other than item 6) CODE	S2206A
ACC-APG - COVID RESPONSE - W58P05 6472 INTEGRITY COURT (BUILDING 4401) ABERDEEN PROVING GROUND MD 21005-3013		DCMA BOSTON 495 SUMMER STREET BOSTON MA 02210-2138	

8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)		
MODERNA US, INC. [***] 200 TECHNOLOGY SQ CAMBRIDGE MA 02139-3578		9A. AMENDMENT OF SOLICITATION NO.
		9B. DATED (SEE ITEM 11)
	X	10A. MOD. OF CONTRACT/ORDER NO. W911QY20C0100
	X	10B. DATED (SEE ITEM 13) 09-Aug-2020

CODE 8PTM0 FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer is extended, is not extended.

Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods:
(a) By completing Items 8 and 15, and returning copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN
REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (If required)
See Schedule

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT S/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

X	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A. FAR 52.243-1 Changes--Fixed Price
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER (Specify type of modification and authority)

E. IMPORTANT: Contractor X is not, is required to sign this document and return copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)
Modification Control Number: [***]
See Block 14 Continuation Page

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) [***] TEL: [***] EMAIL: [***]	
15B. CONTRACTOR/OFFEROR (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY [***] (Signature of Contracting Officer)	16C. DATE SIGNED 14-Apr-2022

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

SECTION SF 30 - BLOCK 14 CONTINUATION PAGE

The following have been added by full text: P00023

OBLIGATION AMOUNT: $10,500,000

a. The purpose of this modification (P00023) is amend the scope of work under contract modification W911QY-20- C-0100-P00022 issued as an Unpriced Change Order (UCO) on 22 March 2022:

From Previous P00022:

(1) Issue an Unpriced Change Order (UCO) for the alignment of Product C Seasonal Boost/Pediatric Primary Series to support use for the age group of 6 months to <6 years (6m-<6y). Final revisions to the Statement of Work, Terms and Conditions, and Price will be established through the definitization process.
(2) Upon execution of this modification, Contractor is directed to take necessary steps to deliver at least [***] doses of Product C, as defined in H.19, that are labeled for use in pediatric primary series for the age group of 6 months to <6 years.
(3) Creates CLIN 5000 for the alignment of Product C from Seasonal Boost to Pediatric Primary Series for the age group of 6 months to <6 years (6m-<6y) per section H.19.
(4) Funds CLIN 5000 for $26,000,000, 50% of the not-to-exceed (NTE) price of $52,000,000, in accordance with DFARS 243.204-70-4.
(5) Add FAR Clause 52.216-24, Limitation of Government Liability; See clause in full text for additional details.
(6) Add DFARS Clause 252.217-7027, Contract Definitization; See clause in full text for additional details.

Amended to (P00023):

(1) Issue an Unpriced Change Order (UCO) for the alignment of [***] doses of Product C Seasonal Boost/Pediatric Primary Series to support use for the age group of 6 months to <6 years (6m-<6y) and shift [***] doses of Product A, Adult Primary, to Product C, Pediatric Primary Series (6m-<6y). Final revisions to the Statement of Work, Terms and Conditions, and Price will be established through the definitization process.
(2) Upon execution of this modification, Contractor is directed to take necessary steps to deliver at least [***] doses of Product C, as defined in H.19, that are labeled for use in pediatric primary series for the age group of 6 months to <6 years.
(3) Update CLIN 5000 to reflect the alignment of Pediatric Primary Series for the age group of 6 months to <6 years (6m-<6y) per section H.19.
(4) Fund CLIN 5000 for an additional $10,500,000 on this modification (previously funded for $26,000,000; for the revised total of $36,500,000 obligated funding) which is 50% of the not-to-exceed (NTE) for the price of $73,000,000 ($52,000,000 on the previous modification P00022 and $21,000,000 for the increase level of effort) in accordance with DFARS 243.204-70-4.
(5) FAR Clause 52.216-24, Limitation of Government Liability; Revised see clause in full text for additional details.
(6) DFARS Clause 252.217-7027, Contract Definitization; Revised see clause in full text for additional details.

b. This modification was requested by the program office to meet the Government’s COVID-19 National Response Strategy.

c. The total value contract has increased by $21,000,000 from $8,197,794,804.60 to $8,218,794,804.60. The total funded amount has increased by $10,500,000 from $8,171,794,804.60 to $8,182,294,804.60

All other terms and conditions remain unchanged.

SECTION A - SOLICITATION/CONTRACT FORM

The total cost of this contract was increased by $21,000,000.00 from $8,197,794,804.60 to $8,218,794,804.60.

SECTION B - SUPPLIES OR SERVICES AND PRICES

CLIN 5000

The CLIN description has changed from Product C Realignment to Pediatric 6m<6y to Realignment to Pediatric 6m<6y.
The CLIN extended description has changed from:

Receipt of this UCO constitutes your Notice to Proceed. The Not-to-Exceed (NTE) Ceiling Price for the UCO is $52,000,00 which $26,000,000 is obligated at the time of modification. Moderna is not authorized to expend any funds in excess of the above obligation limits. A Firm Fixed Price contract modification is contemplated. See Section I for the Definitization Schedule IAW DFARS CLAUSE 252.217-7027.

To:

Receipt of this UCO constitutes your Notice to Proceed. The Not-to-Exceed (NTE) Ceiling Price for the UCO is $73,000,00 which $36,500,000 is obligated thought modification P00022 & P00023. Moderna is not authorized to expend any funds in excess of the above obligation limits. A Firm Fixed Price contract modification is contemplated. See Section I for the Definitization Schedule IAW DFARS CLAUSE 252.217-7027.

The unit price amount has increased by $21,000,000.00 from $52,000,000.00 to $73,000,000.00.
The total cost of this line item has increased by $21,000,000.00 from $52,000,000.00 to $73,000,000.00.

SUBCLIN 500001

The CLIN description has changed from 50% of NTE Amount to NTE Amount.

SUBCLIN 500002 is added as follows:

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
500002					$0.00

NTE Amount FFP
PURCHASE REQUEST NUMBER: 0011776492-0002

NET AMT $0.00

$10,500,000.00

ACRN AR
CIN: GFEBS001177649200001

SECTION E - INSPECTION AND ACCEPTANCE

The following Acceptance/Inspection Schedule was added for SUBCLIN 500002:

INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
N/A	N/A	N/A	N/A

SECTION G - CONTRACT ADMINISTRATION DATA

Accounting and Appropriation Summary for the Payment

Office

As a result of this modification, the total funded amount for this document was increased by $10,500,000.00 from $8,171,794,804.60 to $8,182,294,804.60.

SUBCLIN 500002:

Funding on SUBCLIN 500002 is initiated as follows: ACRN: AR

CIN: GFEBS001177649200001

Acctng Data: 021202220232040000066565426O S.0074658.7.3.8 6100.0153021001

Increase: $10,500,000.00 Total:

$10,500,000.00

Cost Code: A5XAH

SECTION I - CONTRACT CLAUSES

The following have been modified:

52.216-24 LIMITATION OF GOVERNMENT LIABILITY (APR 1984)

(a) In performing this contract, the Contractor is not authorized to make expenditures or incur obligations exceeding $8,218,794,804.60 dollars.

(b) The maximum amount for which the Government shall be liable if this contract is terminated is

$8,218,794,804.60 dollars. (End of clause)

252.217-7027 CONTRACT DEFINITIZATION (DEC 2012)

(a) A Unprice Change Order (UCO) is contemplated. The Contractor agrees to begin promptly negotiating with the Contracting Officer the terms of a definitive contract that will include (1) all clauses required by the Federal Acquisition Regulation (FAR) on the date of execution of the undefinitized contract action, (2) all clauses required by law on the date of execution of the definitive contract action, and (3) any other mutually agreeable clauses, terms, and conditions. The Contractor agrees to submit fixed-price proposal and pricing data supporting its proposal.

(b) The schedule for definitizing this contract is as follows (insert target date for definitization of the contract action and dates for submission of proposal, beginning of negotiations, and, if appropriate, submission of the make-or-buy and subcontracting plans and certified cost or pricing data).

UCO Issued: 28 March 2022
UCO Amendment Issued 15 April 2022
Receipt of Qualifying Proposal: 18 April 2022
Beginning of Negotiations: 2 May 2022
Complete Negotiations: 16 May 2022
Definitization of UCO: 30 May 2022

(c) If agreement on a definitive contract action to supersede this undefinitized contract action is not reached by the target date in paragraph (b) of this clause, or within any extension of it granted by the Contracting Officer, the Contracting Officer may, with the approval of the head of the contracting activity, determine a reasonable price or fee in accordance with subpart 15.4 and part 31 of the FAR, subject to Contractor appeal as provided in the Disputes clause. In any event, the Contractor shall proceed with completion of the contract, subject only to the Limitation of Government Liability clause.

(1) After the Contracting Officer's determination of price or fee, the contract shall be governed by--

(i) All clauses required by the FAR on the date of execution of this undefinitized contract action for either fixed- price or cost-reimbursement contracts, as determined by the Contracting Officer under this paragraph (c);

(ii) All clauses required by law as of the date of the Contracting Officer's determination; and

(iii) Any other clauses, terms, and conditions mutually agreed upon.

(2) To the extent consistent with paragraph (c)(1) of this clause, all clauses, terms, and conditions included in this undefinitized contract action shall continue in effect, except those that by their nature apply only to an undefinitized contract action.

(d) The definitive contract resulting from this undefinitized contract action will include a negotiated firm-fixed price in no event to exceed $8,218,794,804.60.

(End of clause)

(End of Summary of Changes)

Exhibit 31.1

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

CERTIFICATIONS

I, Stéphane Bancel, certify that:

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

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

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

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

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

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

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

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

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

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

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

Date: May 4, 2022

By: /s/ Stéphane Bancel

Stéphane Bancel
Chief Executive Officer
(Principal Executive Officer)

Exhibit 31.2

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

CERTIFICATIONS

I, David W. Meline, certify that:

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

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

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

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

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

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

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

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

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

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

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

Date: May 4, 2022

By: /s/ David W. Meline

David W. Meline
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 on Form 10-Q of Moderna, Inc. (the "Company") for the period ended March 31, 2022 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we, Stéphane Bancel, Chief Executive Officer of the Company, and David W. Meline, Chief Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of our 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 results of operations of the Company.

Date: May 4, 2022

By: /s/ Stéphane Bancel
Stéphane Bancel
Chief Executive Officer
(Principal Executive Officer)

Date: May 4, 2022

By: /s/ David W. Meline
David W. Meline
Chief Financial Officer
(Principal Financial Officer)