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OX40L/IL-23/IL-36γ (mRNA-2752)

Last program update: June 10, 2020

Modality	ID #	Program *Indication*	Preclinical development	Phase 1	Phase 2	Phase 3 and commercial	Moderna rights
Intratumoral immuno-oncology	mRNA-2416	OX40L *Solid tumors/lymphoma* *Advanced ovarian cancer* 	Solid tumors/ lymphoma	Ovarian			Worldwide
	mRNA-2752	OX40L/IL-23/IL-36γ (triplet) *Solid tumors/lymphoma* 					Worldwide
	MEDI1191	IL-12 *Solid tumors* 					50-50 U.S. profit sharing; AZ to pay royalties on ex-U.S. sales

Phase 1 ongoing; patients dosed in combination with durvalumab

OX40L/IL-23/IL-36γ (mRNA-2752) overview

- Moderna's technology enables novel combinations of targets
- Intratumoral delivery may enable delivery of targets locally that are too toxic systemically

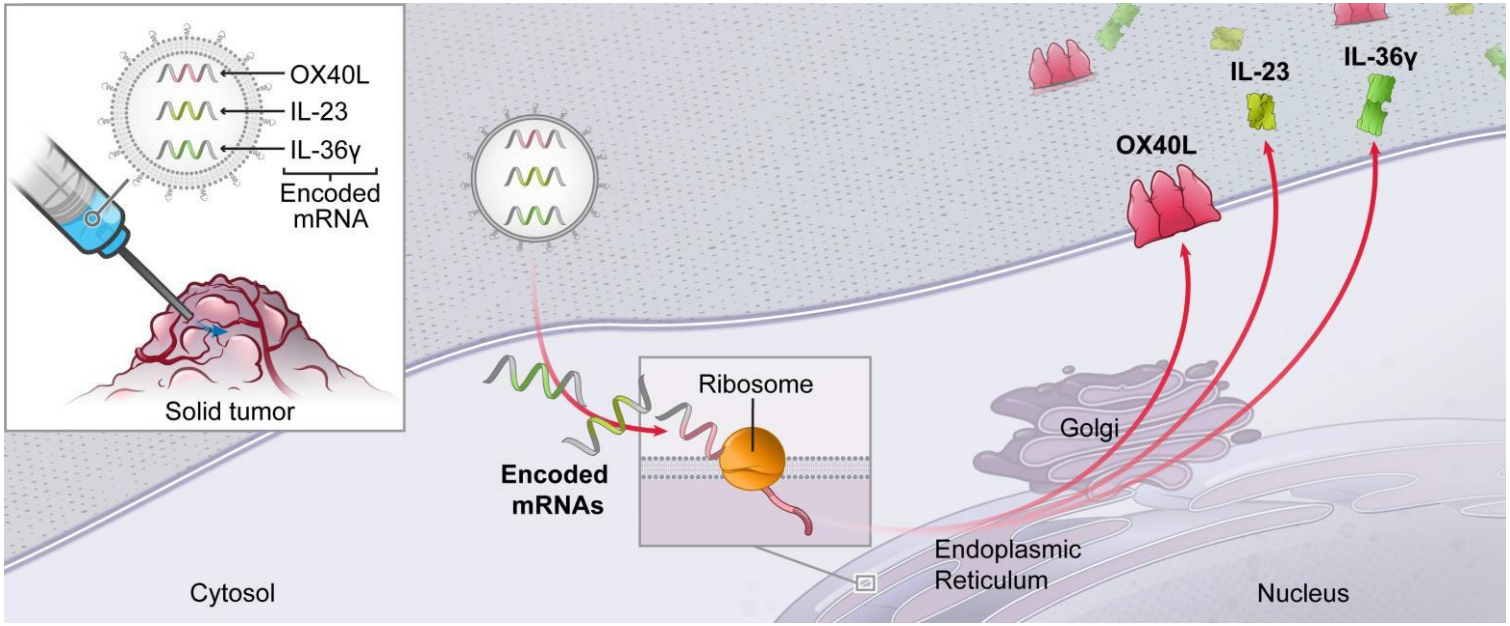
OX40L

- A **powerful co-stimulatory molecule** that enhances T cell expansion, function and memoryformation
- **Native physiological conformation** (homotrimer membrane protein)

+

IL-23 & IL-36γ

- Have **established roles in mediating immune responses** and have been implicated in driving various inflammatory diseases
  - IL-23 is a member of the IL-12 family
  - IL-36γ is a member of the IL-1 family



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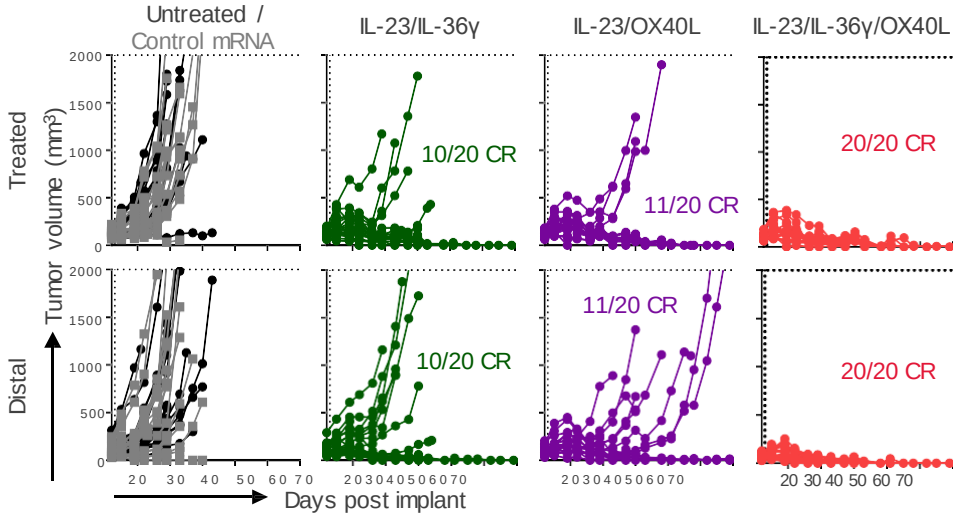
Preclinical data – combination demonstrates synergistic effects

Species: Mouse



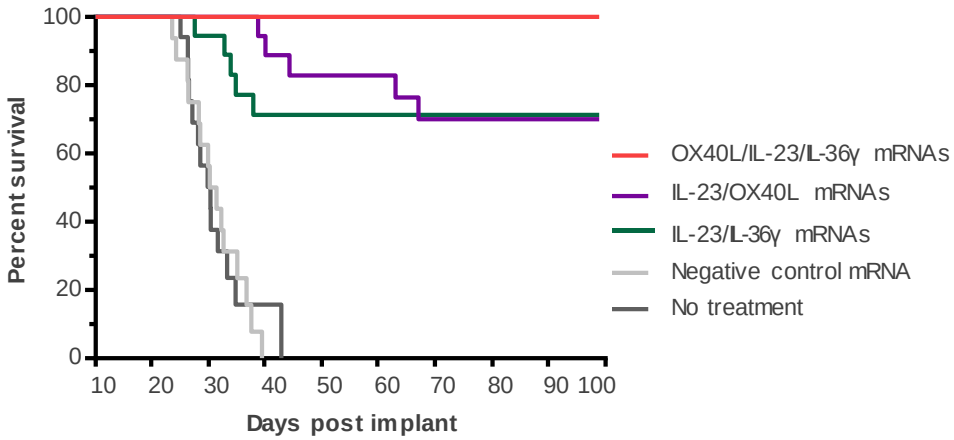
SCIENCE TRANSLATIONAL MEDICINE | RESEARCH ARTICLE

CANCER

Durable anticancer immunity from intratumoral administration of IL-23, IL-36γ, and OX40L mRNAs

Tumor volumes of both the treated and untreated tumors. Mice carrying bilateral MC38-S tumors received mRNA injected into the right flank tumor only.

Species: Mouse



100% (n=20) complete responders with mouse OX40L/IL-23/IL-36γ in MC38 dual flank syngeneic mouse model study

Regression of distal, untreated tumors following local treatment; 100% survival observed in pre-clinical studies

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Durable anticancer immunity from intratumoral administration of IL-12, IL-36γ and OX40L mRNA's; Science Translation Medicine; Hewitt et al., 2019

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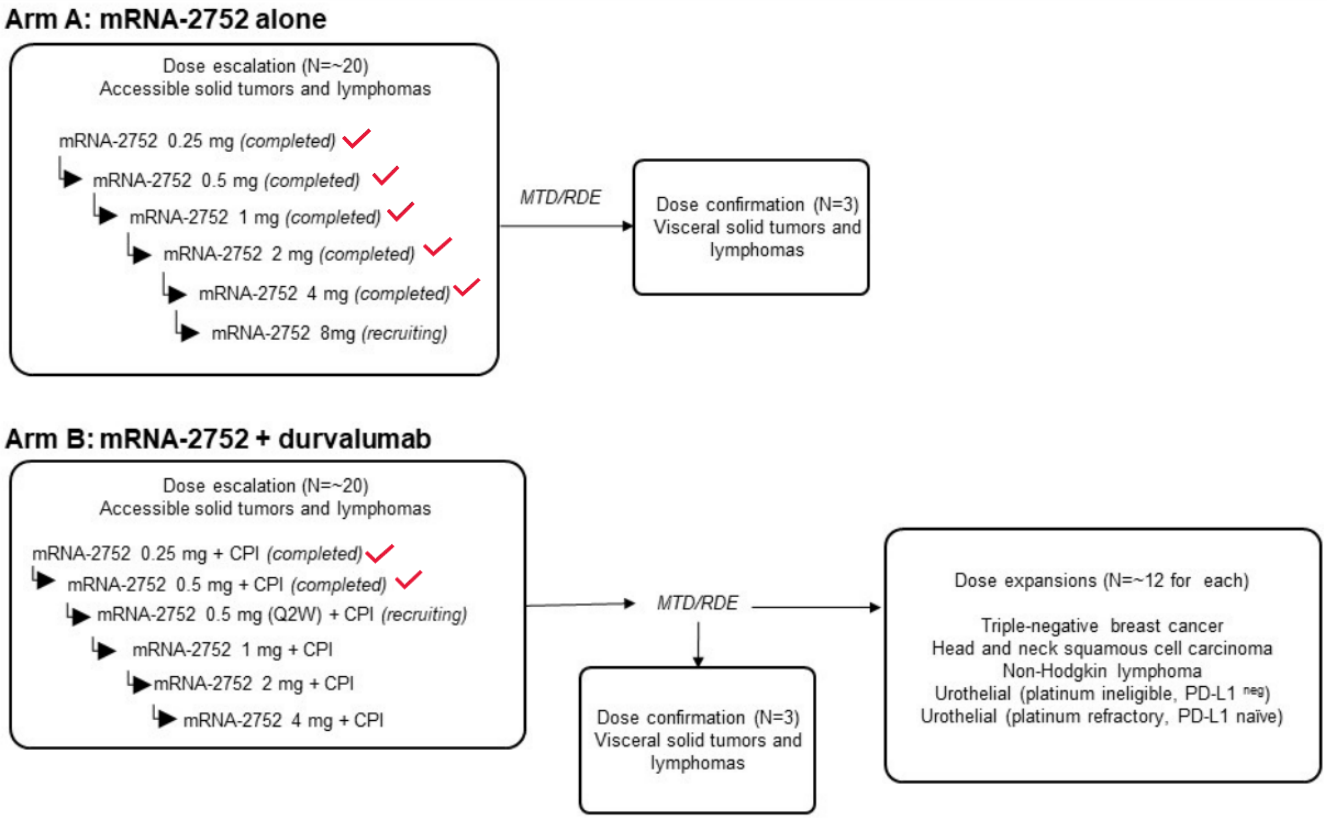
OX40L/IL-23/IL-36γ (Triplet) (mRNA-2752)

Phase 1 ongoing; patients dosed in combination with durvalumab

Key Objectives

- Evaluate safety and tolerability of mRNA-2752 administered alone and in combination with PD-L1 inhibitor
- Define maximum tolerated dose (MTD) and recommended dose for expansion for mRNA-2752 alone and in combination with durvalumab
- Intended to assess: (1) Anti-tumor activity, (2) Protein expression in tumors and (3) Pharmacokinetics



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OX40L/IL-23/IL-36γ (Triplet) (mRNA-2752)

Data presented at ASCO 2020

- At ASCO 2020, we present findings from a first-in-human study of iTu mRNA-2752 in solid tumor patients as monotherapy or in combination with durvalumab. As of April 8, 2020, 29 patients were evaluable for safety and 23 patients evaluable for efficacy.

Related Adverse Events*				
	Arm A		Arm B	
	Grade 1-2	Grade 3	Grade 1-2	Grade 3
Injection site erythema	6	-	3	-
Injection site pain	6	-	2	-
Pyrexia	5	1**		
Chills	3	1**		
Fatigue	3	1**		
Alanine aminotransferase increased	2	-		
Aspartate aminotransferase increased	2	-		
Back pain	2	-		
Rash maculo-popular	2	-		
Injection site reaction	-	1**		
Malaise	-	1**		

*Treatment-related AEs reported once per patient. **All Gr 3 events observed in 1 patient @ 4mg dose
AEs: ≥ 2 patients (grade 1-2), ≥ 1 patient (grade 3), No Gr 4 or 5 AEs were reported

Responses in evaluable patients per RECIST 1.1		
Best Overall Response	Arm A (n=15)	Arm B (N=8)
Partial Response	-	1
Stable Disease (SD)	5	4
Progressive Disease (PD)	10	3

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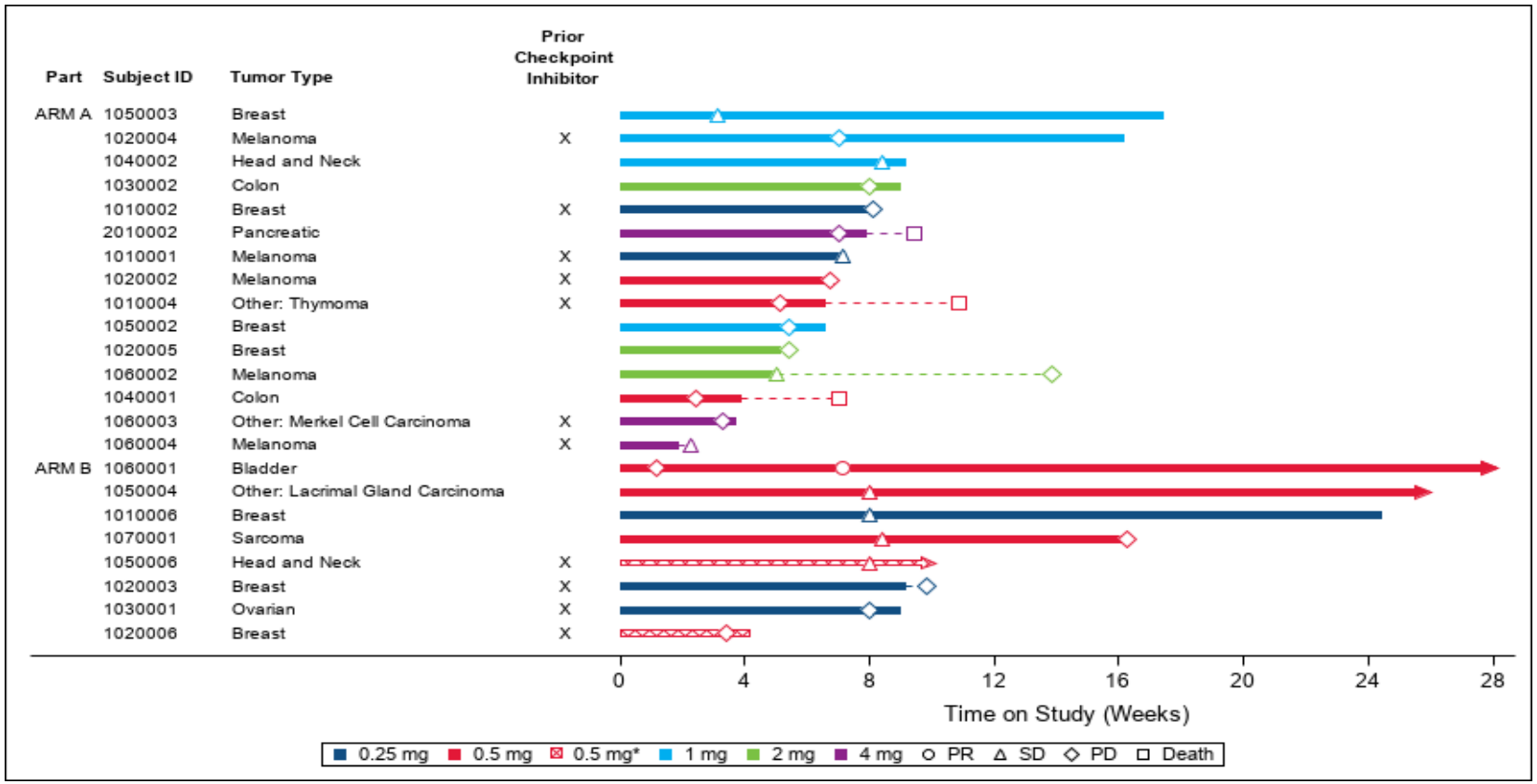
Data presented at ASCO 2020

mRNA-2752-P101 swimmer plot: per RECIST 1.1



17 patients on Arm A with duration on study up to 16 weeks. 12 patients on Arm B up to 28 weeks on study and continuing at time of data cutoff.

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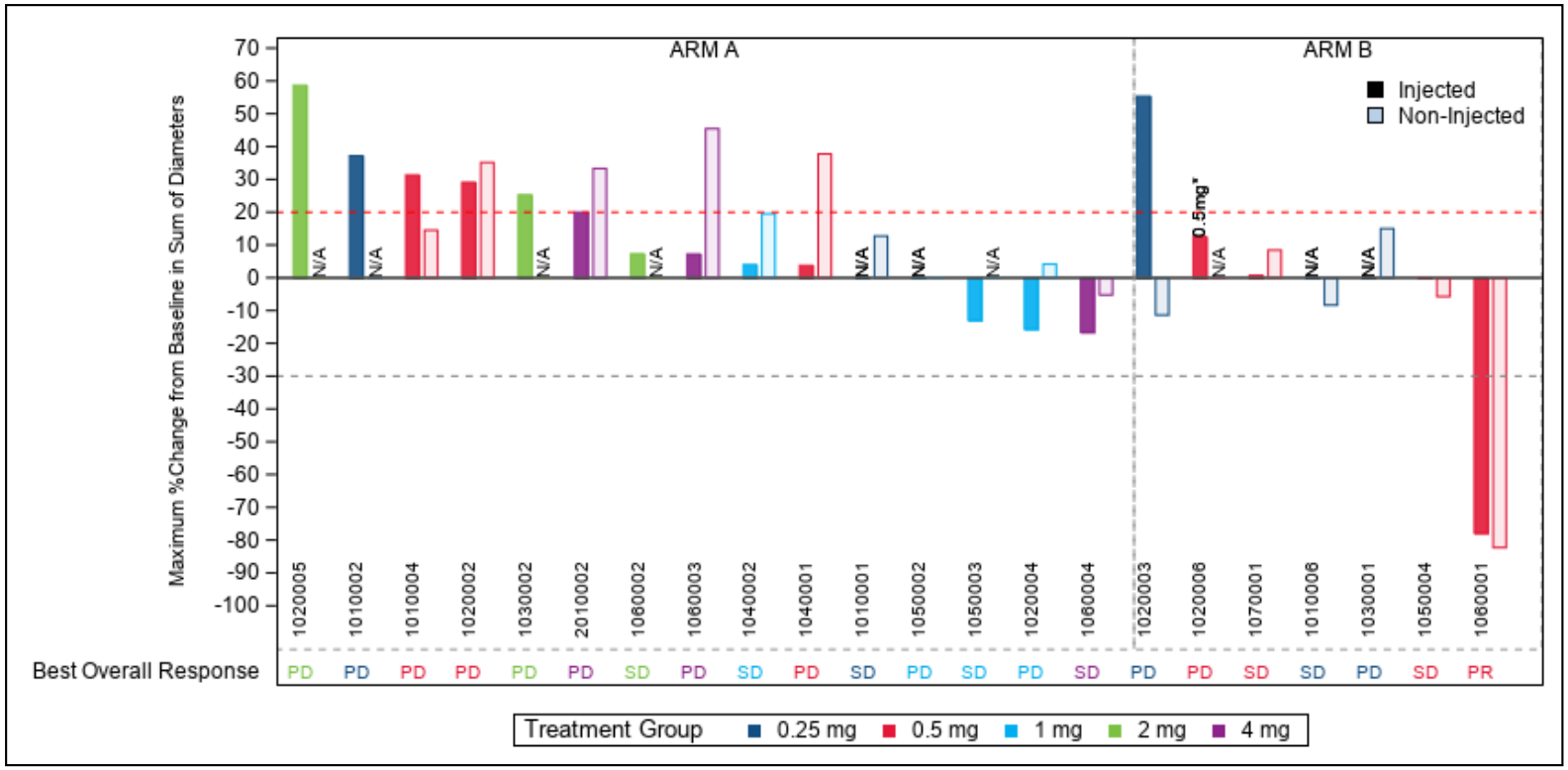
Data presented at ASCO 2020

mRNA-2752-P101 Waterfall Plot of Maximum %Change from Baseline in Sum of Diameters of Target Lesions Based on Investigator Assessment per RECIST 1.1



Tumor shrinkage in both injected and un-injected target lesions in both monotherapy and in combination with the partial response and greatest reduction being noted in a patient in the combination arm.

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Conclusions from ASCO 2020 presentation

- iTu mRNA-2752 given as monotherapy and in combination with durvalumab is tolerable at all dose levels studied with no DLTs reported and the majority of related AE's being grade 1 or 2
- Administration of iTu mRNA-2752 is associated with tumor shrinkage in both injected and non-injected lesions in both monotherapy and in combination, with 1 PR in a PD-L1 low squamous-cell bladder patient
- **Increased IL-23 and IL-36γ protein expression after 6-24 hours in tumor and/or plasma, and increased levels of downstream cytokines IL-22 and IL-6, respectively, were observed**
- Analyses of tumor and plasma biomarkers suggest a sustained immunomodulatory effect of treatment that includes elevated IFN-γ, TNF-α, and PD-L1 levels
- All post-treatment plasma cytokine levels evaluated (including IL-6, TNF-α, IFN-γ, IL-8, IL-2, IL-10) were well below what has been suggested as clinically toxic levels for these cytokines in cytokine release syndrome (Yiu et al., 2012)
- These data support the ongoing testing of the mRNA-2752/durvalumab combination in Arm B of the study

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Forward-looking statements

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995, as amended including, but not limited to, statements concerning potential development candidate applications, development candid ate activities, preclinical and clinical studies, regulatory submissions and approvals, risk management and estimates and forward -looking projections with respect to Moderna or its anticipated future performance or events. In some cases, forward -looking statements can be identified by terminology such as “may,” “should,” “expects,” “intends,” “plans,” “aims,” “anticipates,” “believes,” “estimat es,” “predicts,” “potential,” “continue,” or the negative of these terms or other comparable terminology, although not all forward -looking statements contain these words. The forward-looking statements in this presentation are neither promises nor guarantees, and you should not place undue reliance on these forward-looking statements because they involve known and unknown risks, uncertainties and other factors, many of which are beyond Moderna’s control and which could cause actual results to differ materially from those expressed or implied by these forward -looking statements. These risks, uncertainties and other factors include, among others: preclinical and clinical development is lengthy and uncertain, especially for a new category of medicines such as mRNA, and therefore Moderna’s preclinical programs or development candidates may be delayed, terminated, or may never advance to or in the clinic; no mRNA drug has been approved in this new p otential category of medicines, and may never be approved; mRNA drug development has substantial clinical development and regulatory r isks due to the novel and unprecedented nature of this new category of medicines; and those described in Moderna’s most recent Annual Report on Form 10-K filed with the U.S. Securities and Exchange Commission (SEC) and in subsequent filings made by Moderna with SEC, which are available on the SEC's website at www.sec.gov. Except as required by law, Moderna disclaims any intention or responsibility for updating or revising any forward-looking statements in this presentation in the event of new information, future developments or otherwise. These forward-looking statements are based on Moderna’s current expectations and speak only as of the date hereof.

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