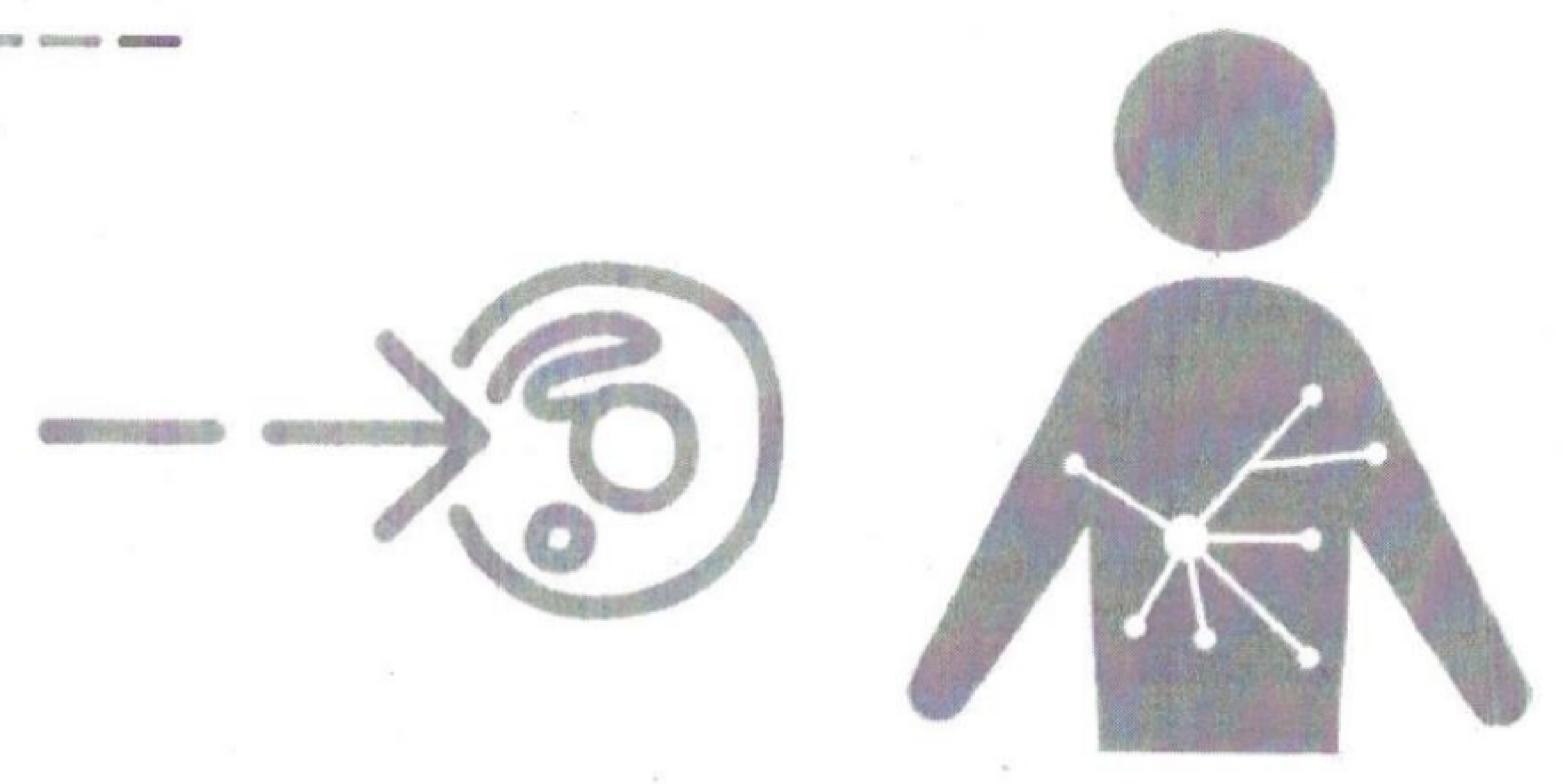
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#### Investor Presentation

May 2017

### Legal Notices

This presentation does not constitute an offer to sell to, or a solicitation of an offer to buy from, anyone in any state or in any other jurisdiction, whether under the Securities Act of 1933, as amended, or otherwise.

Various statements in this presentation concerning the future expectations of Moderna Therapeutics, Inc. (together with its affiliates, the "Company"), plans and prospects, including without limitation, the Company's views with respect to the potential for mRNA therapeutics, its expectations with respect to timing of regulatory filings and the reporting of initial data from any clinical trial(s), the potential therapeutic opportunities for mRNA, its expectations regarding its product strategies, and its plans regarding commercialization of mRNA therapeutics constitute forward-looking statements. Actual results may differ materially from those indicated by these forward-looking statements as a result of various important factors, including, without limitation, the Company's ability to discover and develop novel drug candidates and delivery approaches, successfully demonstrate the efficacy and safety of its drug candidates, the pre-clinical and clinical results for its product candidates, which may not support further development of product candidates, actions of regulatory agencies, which may affect the initiation, timing and progress of clinical trials, obtaining, maintaining and protecting intellectual property, the Company's ability to enforce its patents against infringers and defend its patent portfolio against challenges from third parties, obtaining regulatory approval for products, competition from others using technology similar to the Company's and others developing products for similar uses, the Company's ability to manage operating expenses, the Company's ability to obtain additional funding to support its business activities and establish and maintain strategic business alliances and new business initiatives, the Company's dependence on third parties for development, manufacture, marketing, sales and distribution of products, the outcome of litigation, and unexpected expenditures. In addition, any forward-looking statements represent the Company's views only as of today and should not be relied upon as representing its views as of any subsequent date. The Company explicitly disclaims any obligation to update any forward-looking statements.



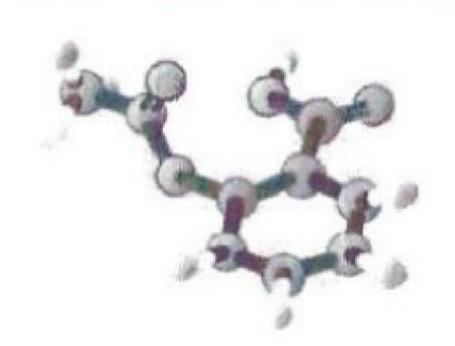
# Moderna as of May 2017... 6 Years into the Story

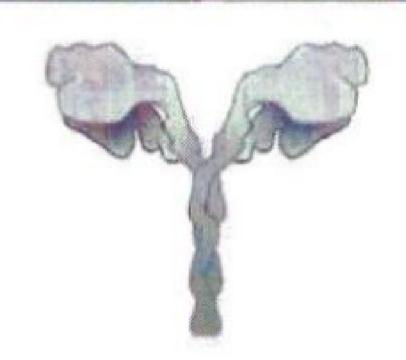
- Potentially disruptive drug technology mRNA is the software of life
- Development pipeline breadth 3 therapeutic areas ID, oncology, CV
- Development pipeline depth 12 programs
  - 5 medicines in the clinic
  - 2 additional INDs opened by FDA
  - 5 additional DCs nominated in pre-clinical development
- 4 industry-leading partners (AZ, Merck, Alexion, Vertex) and 3 government / not-for-profit partners (DARPA, Gates Foundation, BARDA)
  - 3 have asked to do more together
- Strong capital position
  - \$1.22bn cash @ end of March, plus >\$200mm of grants available
- Unrivaled talent 500 people



# Pharma/Biotech is Massive, with ~\$1 Trillion of Sales (2017E) for Small Molecules and Biologics

Small Molecule Drugs Biologics (Recombinant Proteins & Antibodies)





	Global R	Revenues
1994	\$165 bn	\$10 bn
2004	\$425 bn	\$55 bn
2014	\$600 bn	\$180 bn

#### Risky - Probability of success low

- Low risk targets are gone
- N=1. Each molecule is unique, so few learnings across drug programs

#### Slow/Unscalable

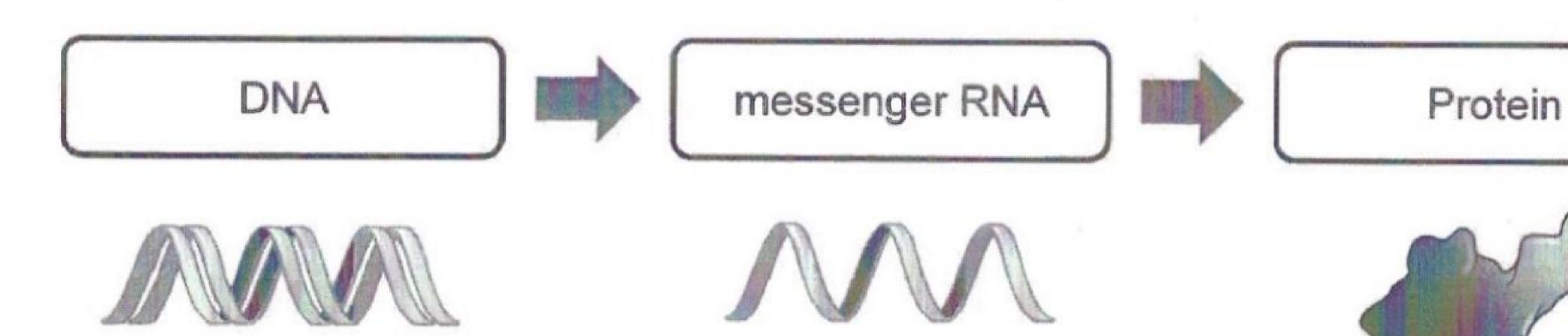
 Each molecule demands a unique manufacturing process for research and development

Source: Evaluate Ltd., 01-Nov-2016. Market sizes have been rounded



### What if mRNA Could be a Drug?

#### Central Dogma of Molecular Biology



Hard Drive

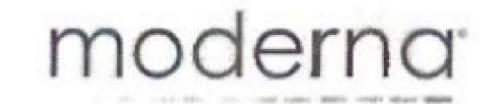
DNA stores our genetic information

Software

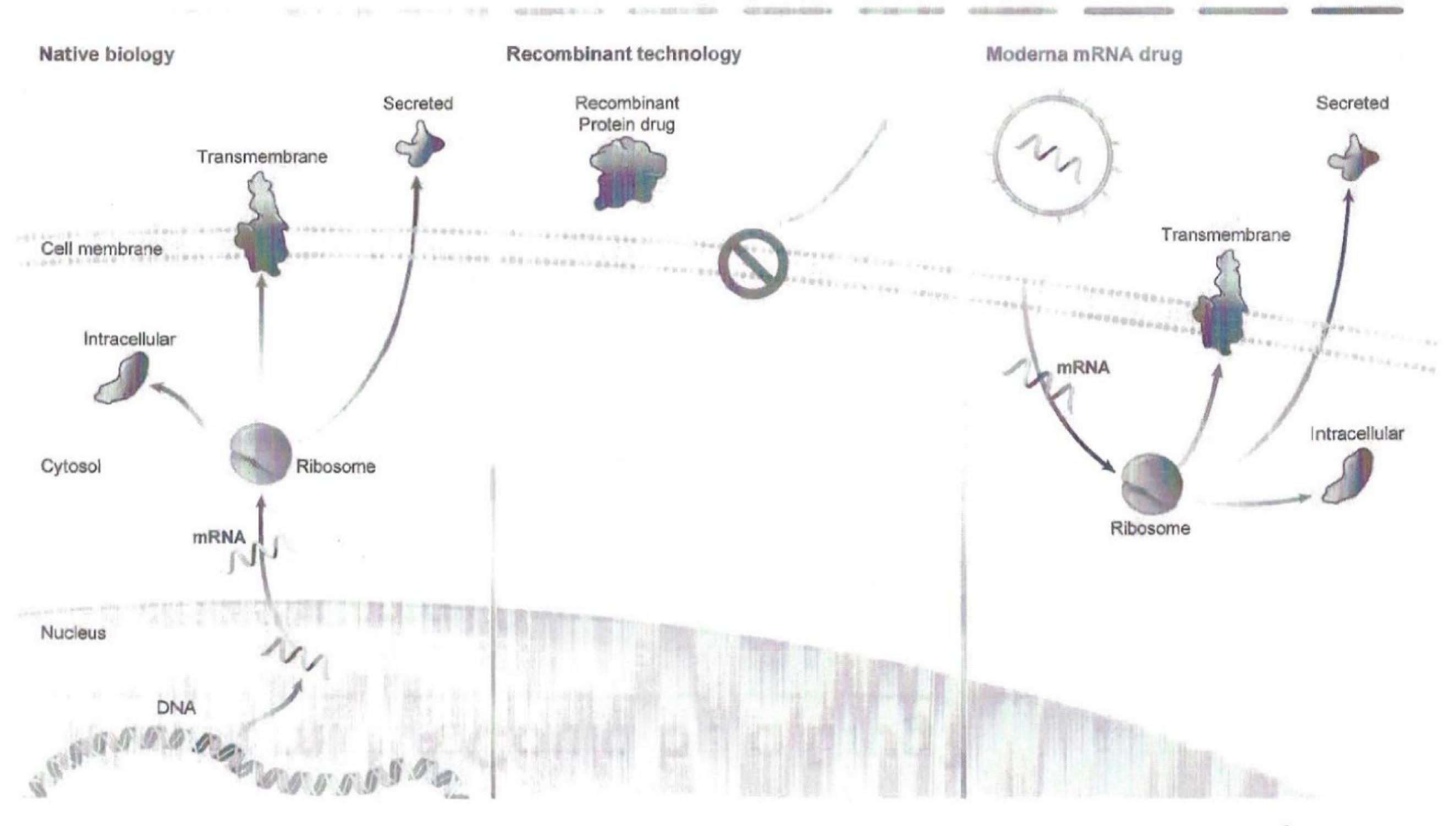
mRNA reads off the DNA and instructs cells to make protein



Proteins accomplish the work in the body – structure, signaling, metabolism, etc.



### If mRNA Could be a Drug... it Would Enable New Intra-cellular and Membrane-bound Proteins





# If mRNA Could be a Drug... it Would be a Platform It would act like software; only the coding region varies from mRNA drug to mRNA drug

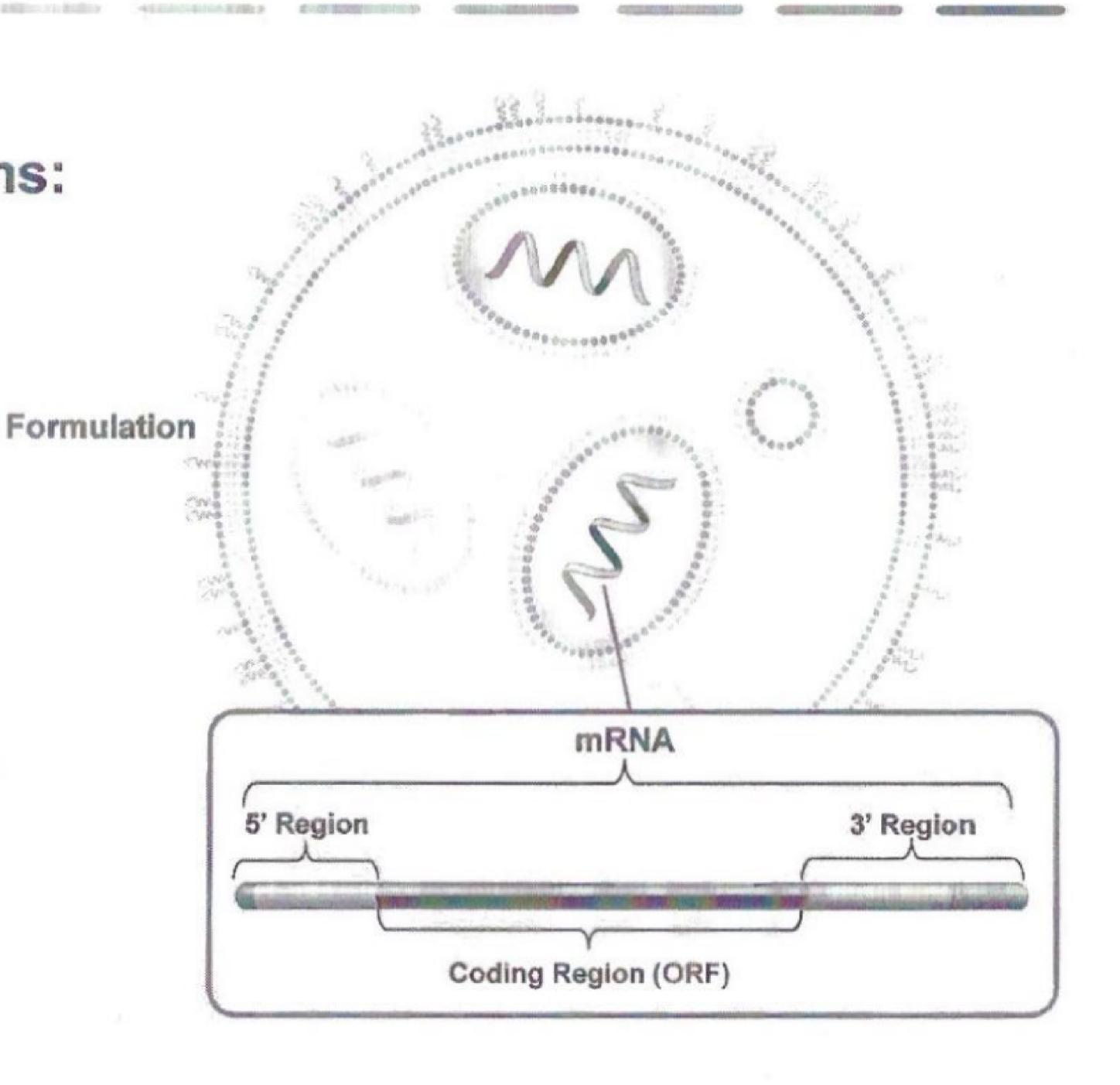
#### Within a given set of applications:

- Formulation = identical
- 5' Region = identical
- · 3' Region = identical

#### Coding Region (ORF)

Varies to encode for specific protein

If mRNA works once, it should work many times





# If mRNA Could be a Drug...3 Value Drivers Combine to Present a Unique Opportunity

#### Product abundance:

- Take your pick of protein to encode
- Opportunity to hit hundreds of previously undruggable targets
- Rational drug design (and ability to combine mRNAs)

#### · Speed:

- Enable faster research to turn ideas into reality
- Enable faster development to generate clinical data

#### Reduced cost versus traditional pharma/biotech companies:

- Run faster R&D with less attrition (platform de-risking)
- De-risked capital expenditures manufacturing infrastructure serves all drugs in the pipeline
- Lower COGS than biologics possible due to cell-free process

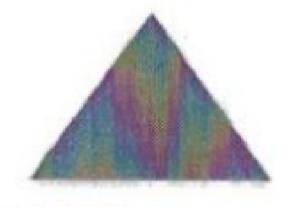


### Our Platform Takes an Integrated Approach to mRNA Drug Design

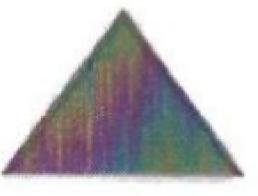
#### **Key Platform Components**











Chemistry

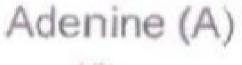
Process

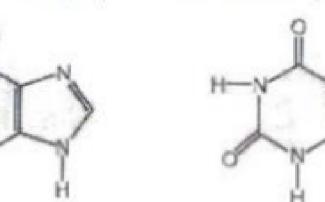
Bioinformatics

mRNA Engineering

Formulation



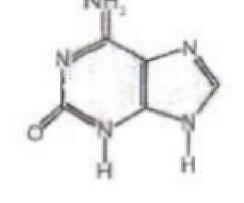


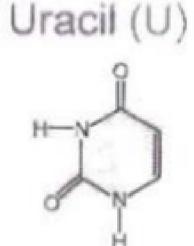


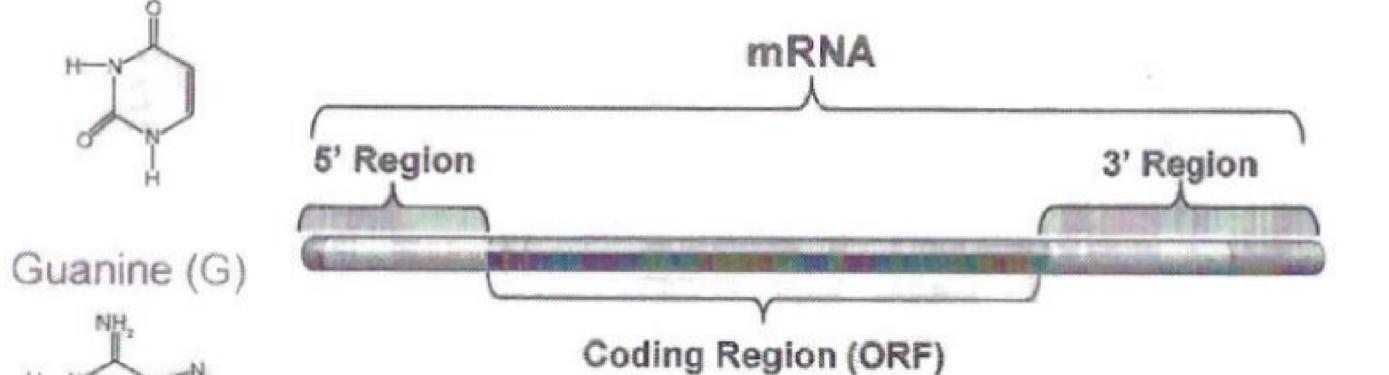


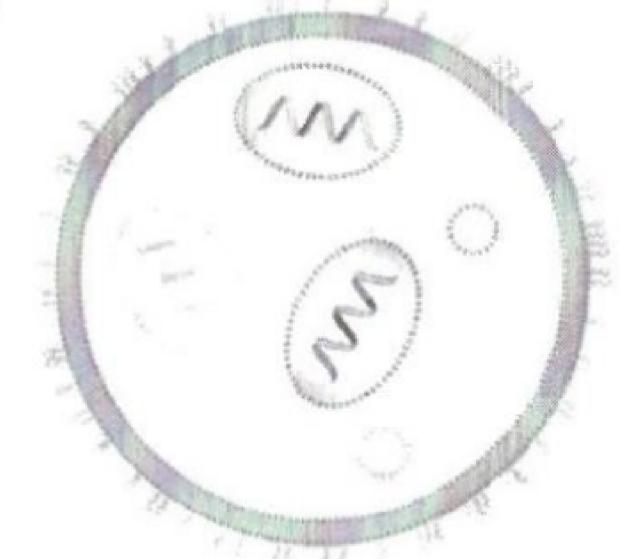






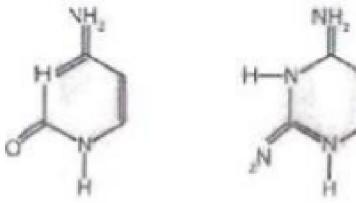






Cytosine (C)

111-1-9





# Modalities are Toolkits Created from Different Platform Components

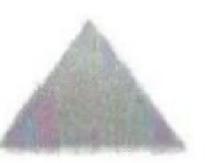
mRNA Technology Platform



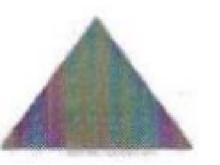
Formulation



Process



**Bioinformatics** 

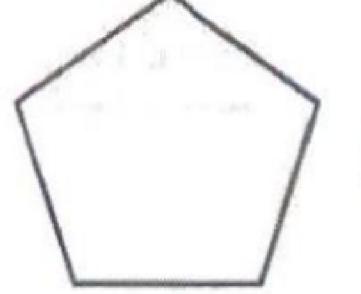


mRNA Engineering

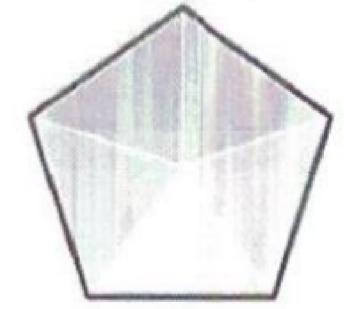


Chemistry

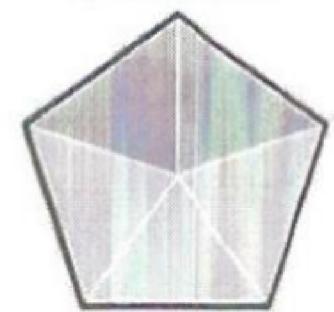




Prophylactic Vaccines (IM)



Therapeutic Vaccines (IM)



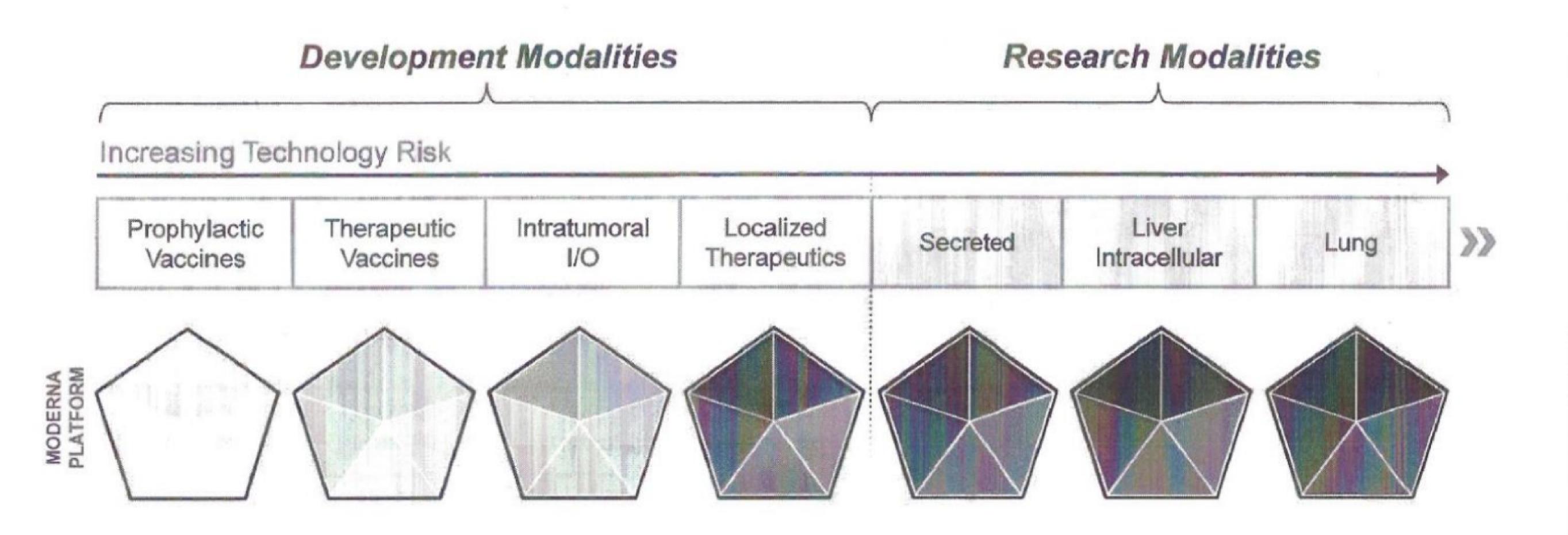
Intratumoral I/O



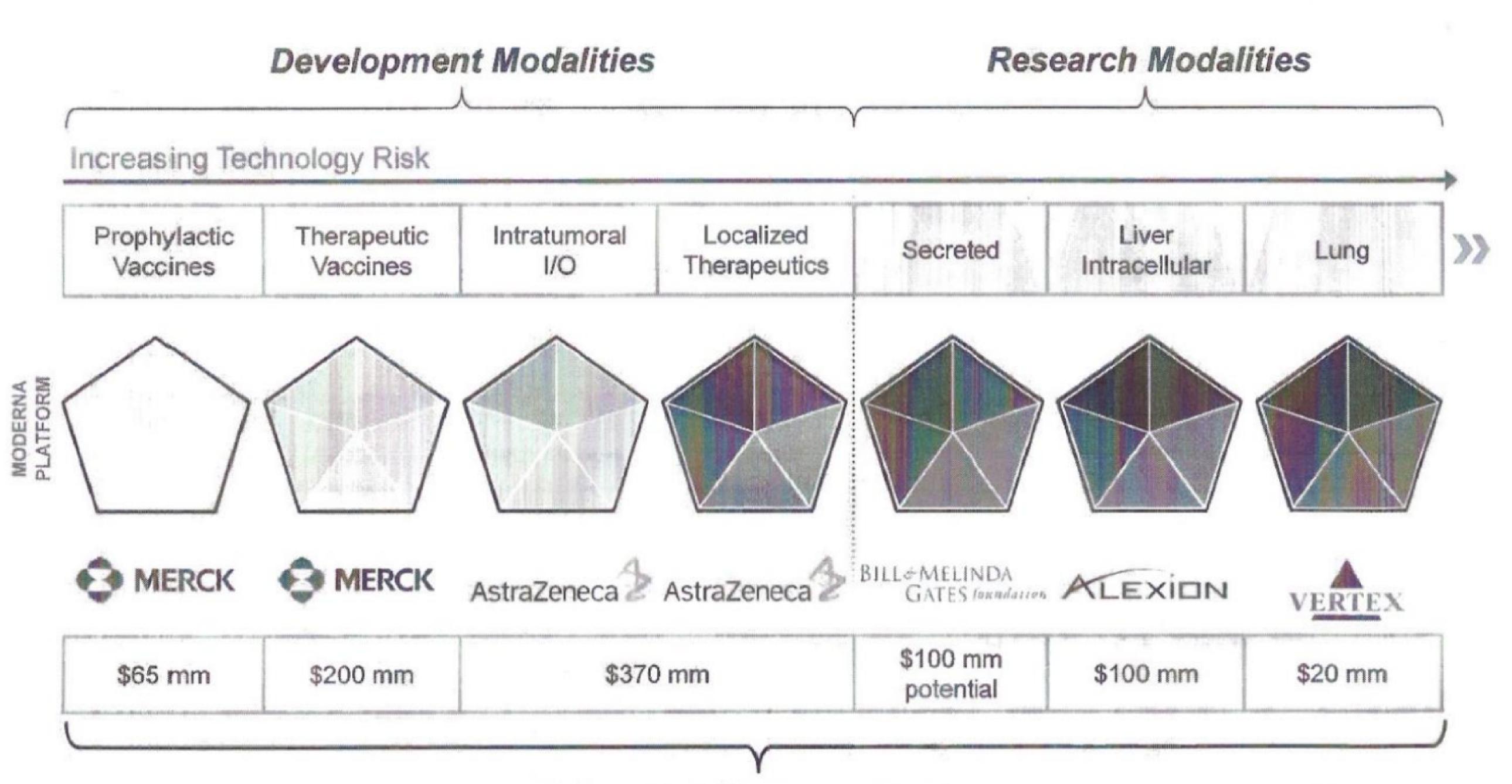
Localized Therapeutics



### Our Platform is Enabling Many Modalities to Prevent and Treat Disease



# Partnerships Provide Leverage to Continue Building the Platform and New Modalities



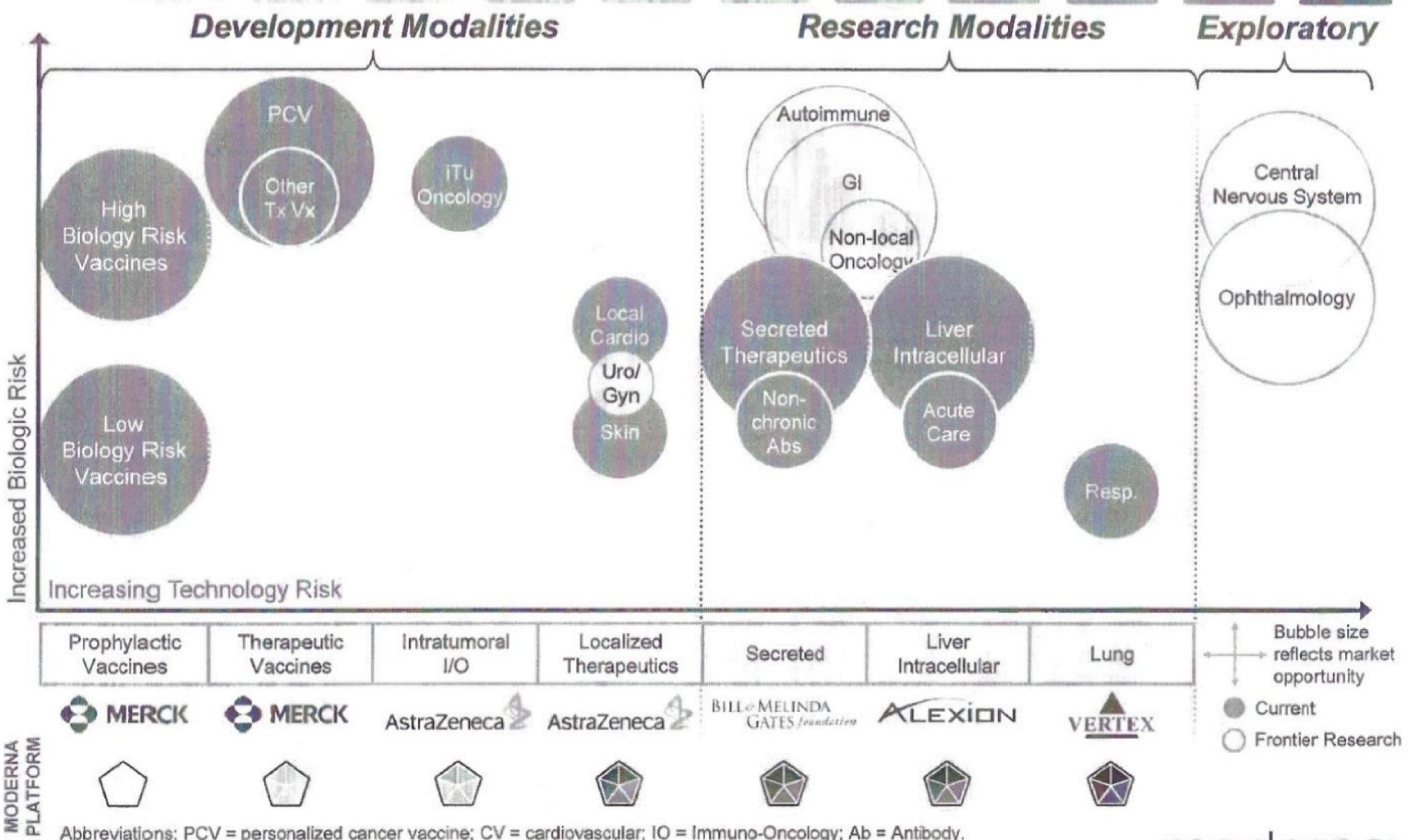
**Upfront + Milestones So Far** 

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>>> Exploratory



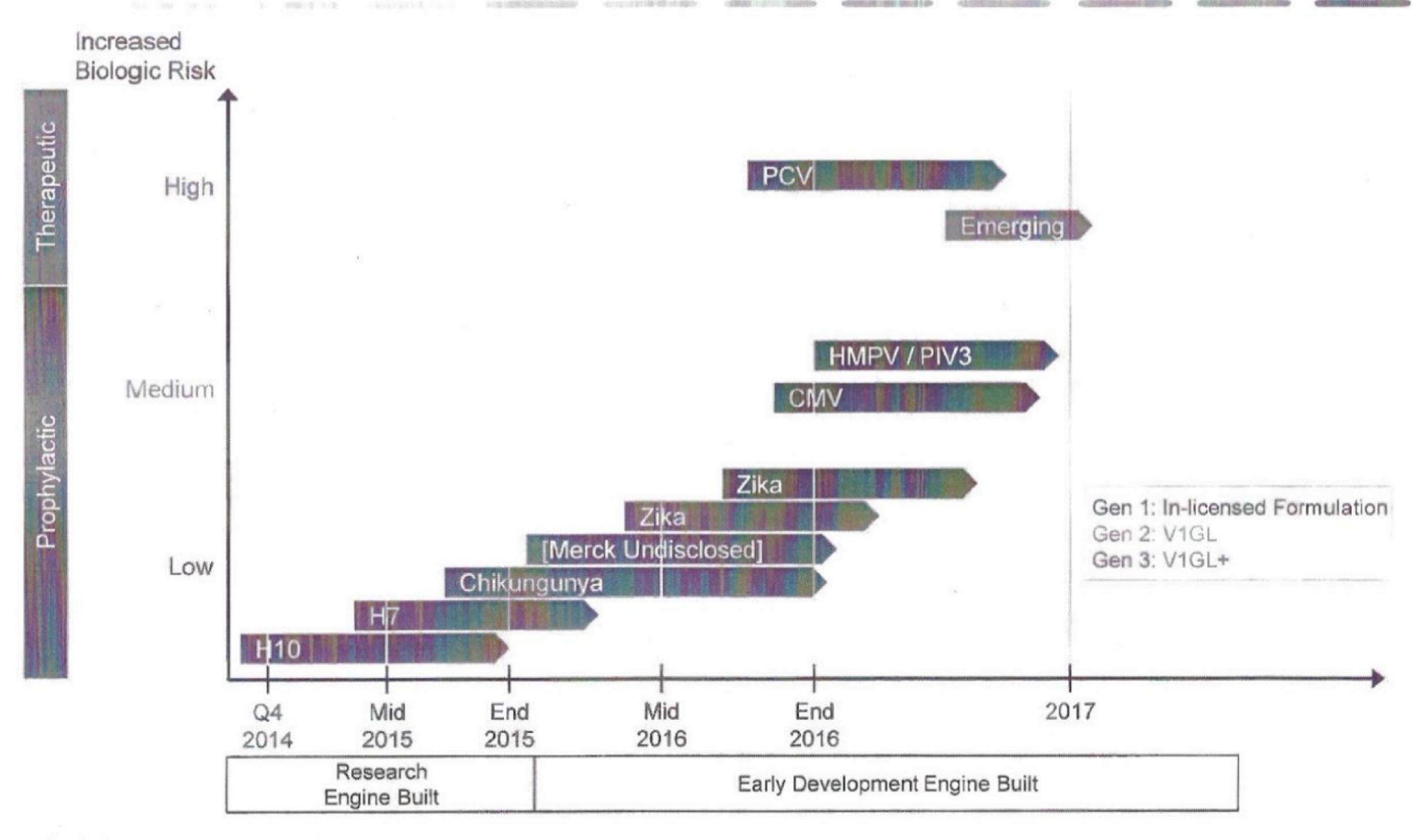
### As with Vaccines, Other Modalities' Target Space Will Expand as the Biology is De-risked



Abbreviations: PCV = personalized cancer vaccine; CV = cardiovascular; IO = Immuno-Oncology; Ab = Antibody.

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# Our Growing Vaccine Modality Exemplifies a Biology-Driven Approach to Value Creation...



Abbreviations: PCV = personalized cancer vaccine;

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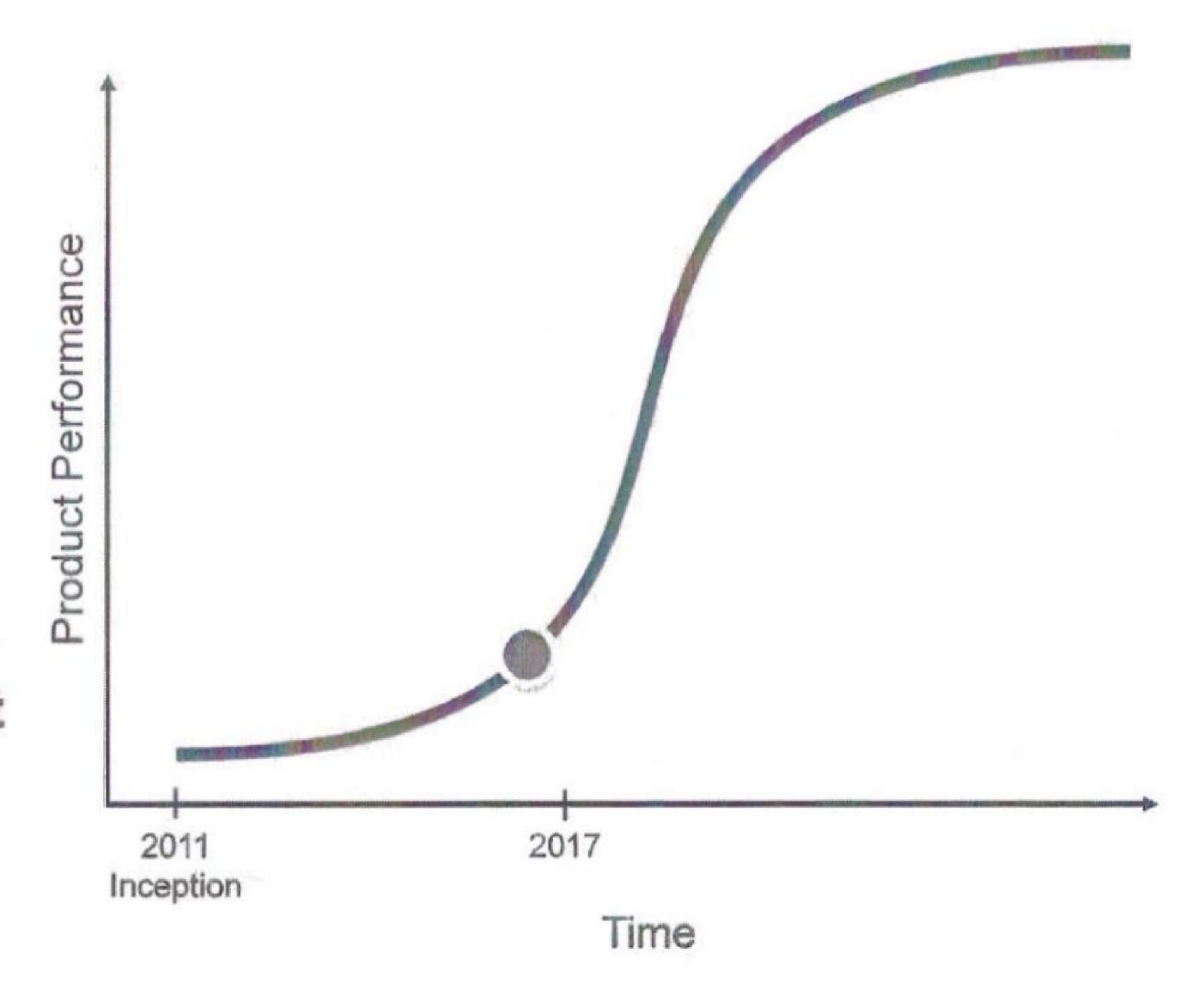
In addition to advancing our pipeline, Moderna has made critical investments in:

- mRNA technology platform
- Research engine
- Early development engine

### Moderna's mRNA Technology Platform

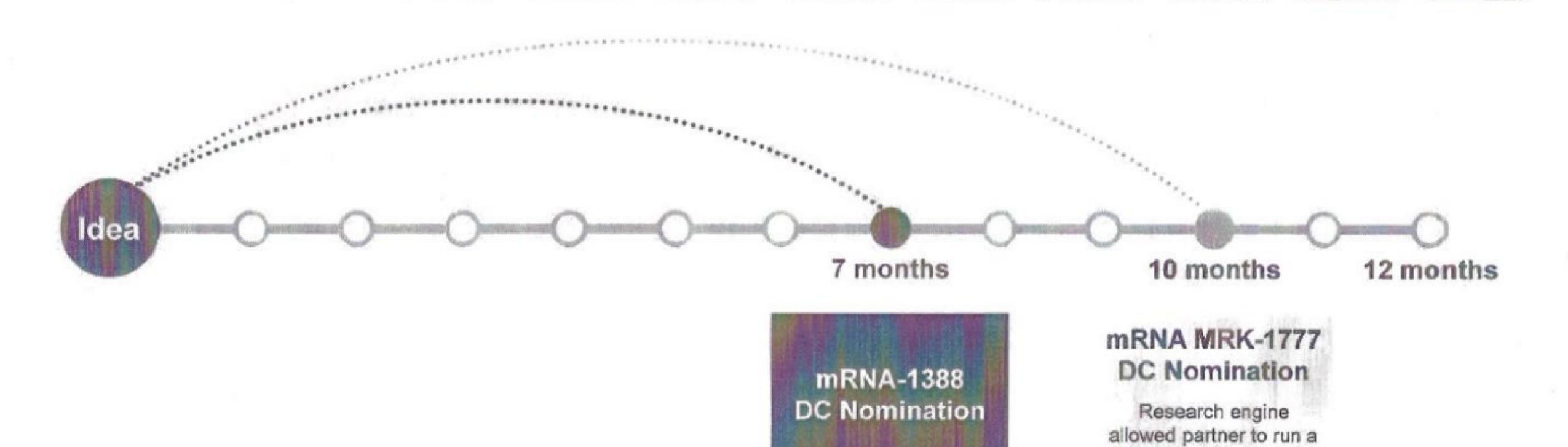
Over 300 scientists and engineers dedicated to mRNA platform research across chemistry, biology, formulation, and technical operations

\$100mm annual investment in the mRNA platform



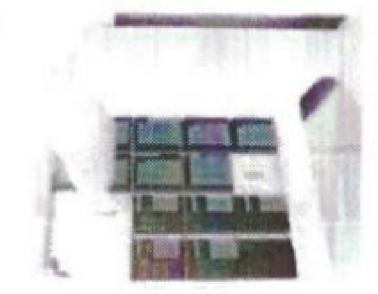
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### Moderna's Research Engine









Automated preclinical production systems that support more than 1,000 novel mRNA deliveries per month

16 arm trial in parallel

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### Moderna's Early Development Engine

Focusing on: Quality » Scalability » Speed » Cost

**GLP Toxicology** 



Moderna Program DC Nomination

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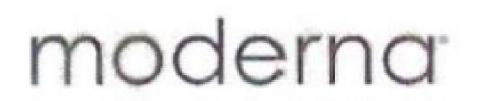
Clinical Trials



**GMP Manufacturing** 

Moderna





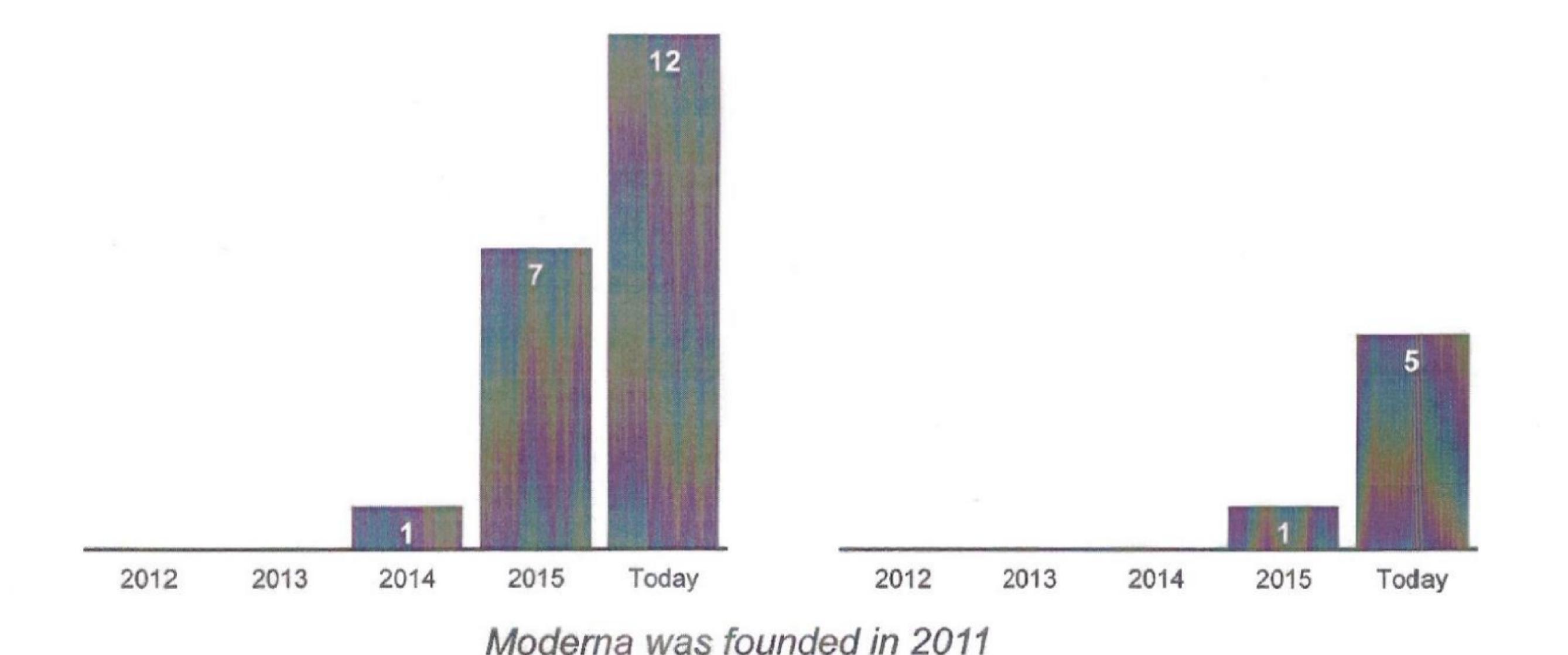
### We are Continuing to Gain Momentum 12 development candidates nominated and 5 in the clinic

# of mRNA Development Candidates at Year End

SHEL-TH

# of mRNA Drugs in Clinical Trials

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### Our Pipeline Today

#### 4 vaccines & 1 therapeutic in the clinic, 12 DCs total

	Development Candidate (DC)	Lead	Indication / Target	Formulation	GLP Toxicology	IND/CTA Filed	Phl	Ph 2	Funding
	mRNA-1440	Moderna	Influenza H10	In Licensed	1	4	Started Dec '15		
	mRNA-1851	Moderna	Influenza H7	In Licensed	1	1	Started: May 16		
	mRNA MRK-1777	Merck	Undisclosed	In Licensed	1	1	Started: Nov 16		
Viral	mRNA-1388	Moderna	Chikungunya	In Licensed	1	1	Safe to Proceed to Clinic		DARPA
Vaccines	mRNA-1325	Moderna	Zika	In Licensed	4	1	Started: Dec '16		DARPA, BARDA
	mRNA-1706	Moderna	Zika	V1GL	Ongoing				
	mRNA-1647	Moderna	CMV	V1GL	Ongoing				
	mRNA-1653	Moderna	HMPV/PIV3	V1GL	Ongoing				
Immuno- Oncology	mRNA-4157	Moderna Merck	Personalized Cancer Vaccine	V1GL	1	1			
	mRNA-2416	Moderna	OX40L	N1GL	1	1	Safe to Proceed to Clinic		
	mRNA-2905	AstraZeneca Moderna	IL-12	N1GL	Ongoing				
CV	mRNA AZD-8601	AstraZeneca	VEGF-A	Citrate / Saline	1	1	Started: Jan 17		

Abbreviations: GLP = good laboratory practice: IND = investigational new drug; CTA = clinical trial authorization; CMV = cytomegalovirus; CV = cardiovascular; HMPV = human metapneumovirus; PIV3 = parainfluenza virus 3; IL-12 = interleukin-12; VEGF-A = vascular endotnelial growth factor A.

a de



### Our Pipeline - Pandemic FlumRNA-1440 & mRNA-1851

	Development Candidate (DC)	Lead	Indication / Target	Formulation	GLP Toxicology	IND/CTA Filed	PhI	Ph 2	Funding
	mRNA-1440	Moderna	Influenza H10	In Licensed	4	1	Started: Dec '15		
	mRNA-1851	Moderna	Influenza H7	In Licensed	4	1	Started May '16		
	<b>一种人类</b>								
Viral	The state of the s	Vig the Line	A Michigan Ships	By Licenses			Sash in it a seed		
Vaccines	miliani ispo	More than	WZika Ni	7 Jitemed	4.3	1			rater t
			37kg						

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### mRNA-1440 (H10 flu) – First Published Clinical Vaccine Data Show Safety & Protective Titers for 100% of Subjects

- In a naïve patient population, a 100µg dose of our H10N8 influenza vaccine elicited protective titers in 100% of test subjects
- · 0% of volunteers receiving placebo saw an effect
- · Safety signals were promising; AEs in line with other approved vaccines

2	Doses (day 1 and	22)
	(prime + boost)	

Stud	У
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1 1 1

100 µg

Hemagglutinin Inhibition (HAI), day	y 43
Seroprotection % Achieved HAI Titer ≥ 1:40, (n)	100% (23/23)
Microneutralization (MN), day 43	
Seroprotection % Achieved MN Titer ≥ 1:20, (n)	87.0% (20/23)

#### Molecular Therapy

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Preclinical and Clinical Demonstration of Immunogenicity by mRNA Vaccines against H10N8 and H7N9 Influenza Viruses

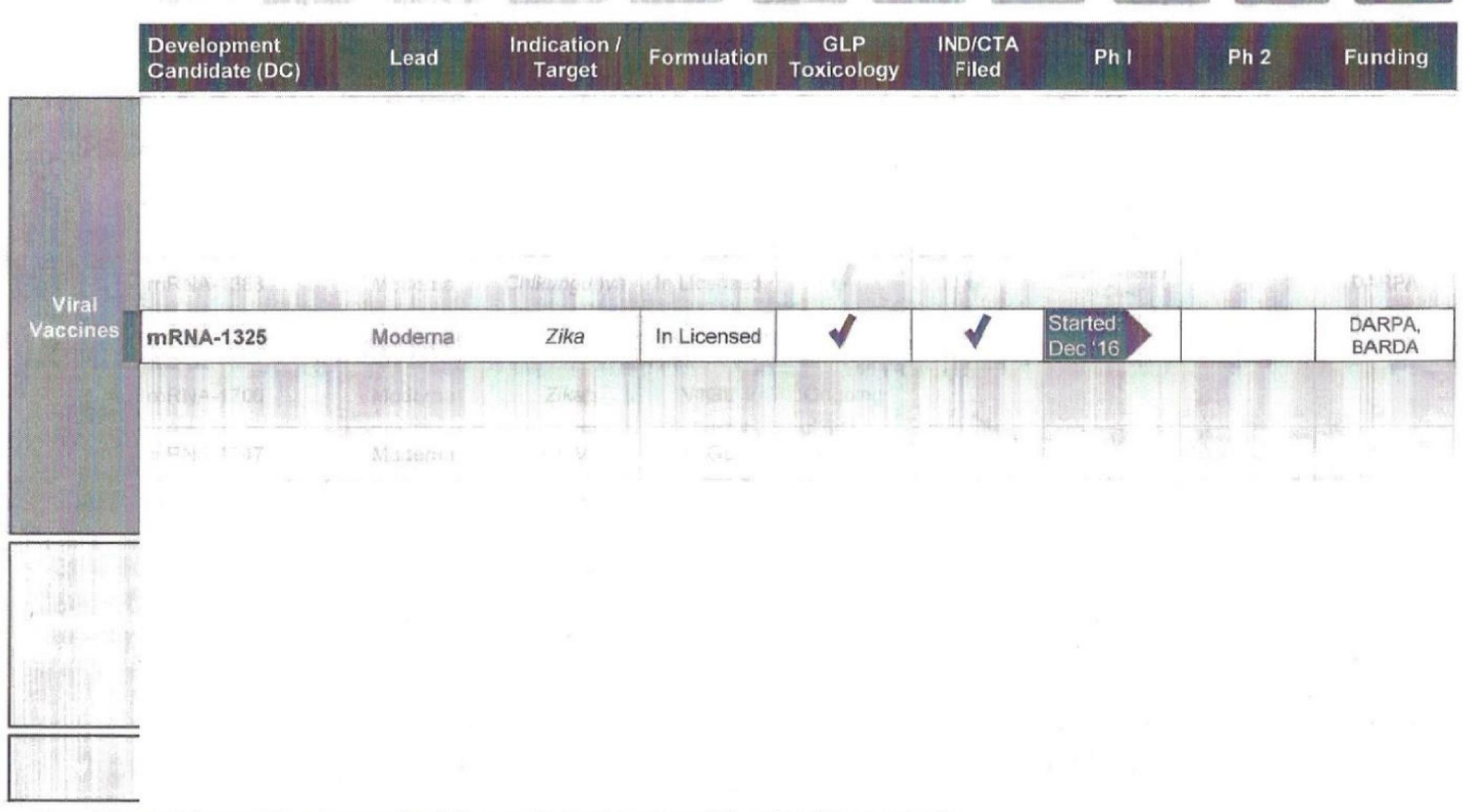
Kapil Balil. foe I. Senn. Olga Yuzhakov, Alex Bulychev. Luis A. Brito, Kimberly I. Hassett. Michael E. Laska, Mike Smith. On Almarsson. James Thompson, Amilear (Mick) Ribeiro. Mike Watson. Tal Zaks. and Giuseppe Ciaramella.

Videra A Moderns Venuero 500 Exhading Square, Cambridge, MA 02126, USA, "Moderns Therapeutics, 200 Technology Square, Constrology, NA 02136, USA



#### Our Pipeline - Zika mRNA-1325

JEB 21



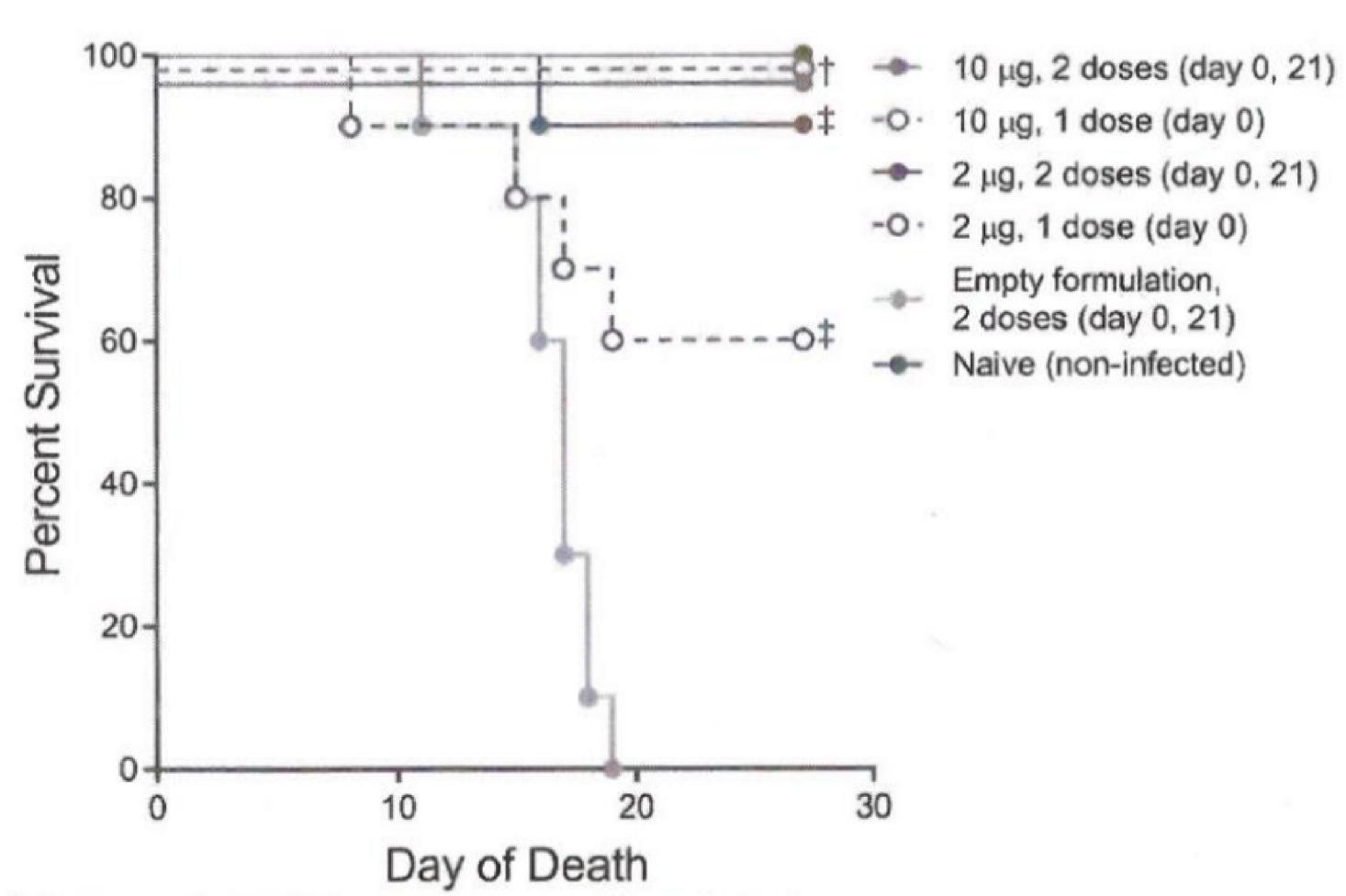
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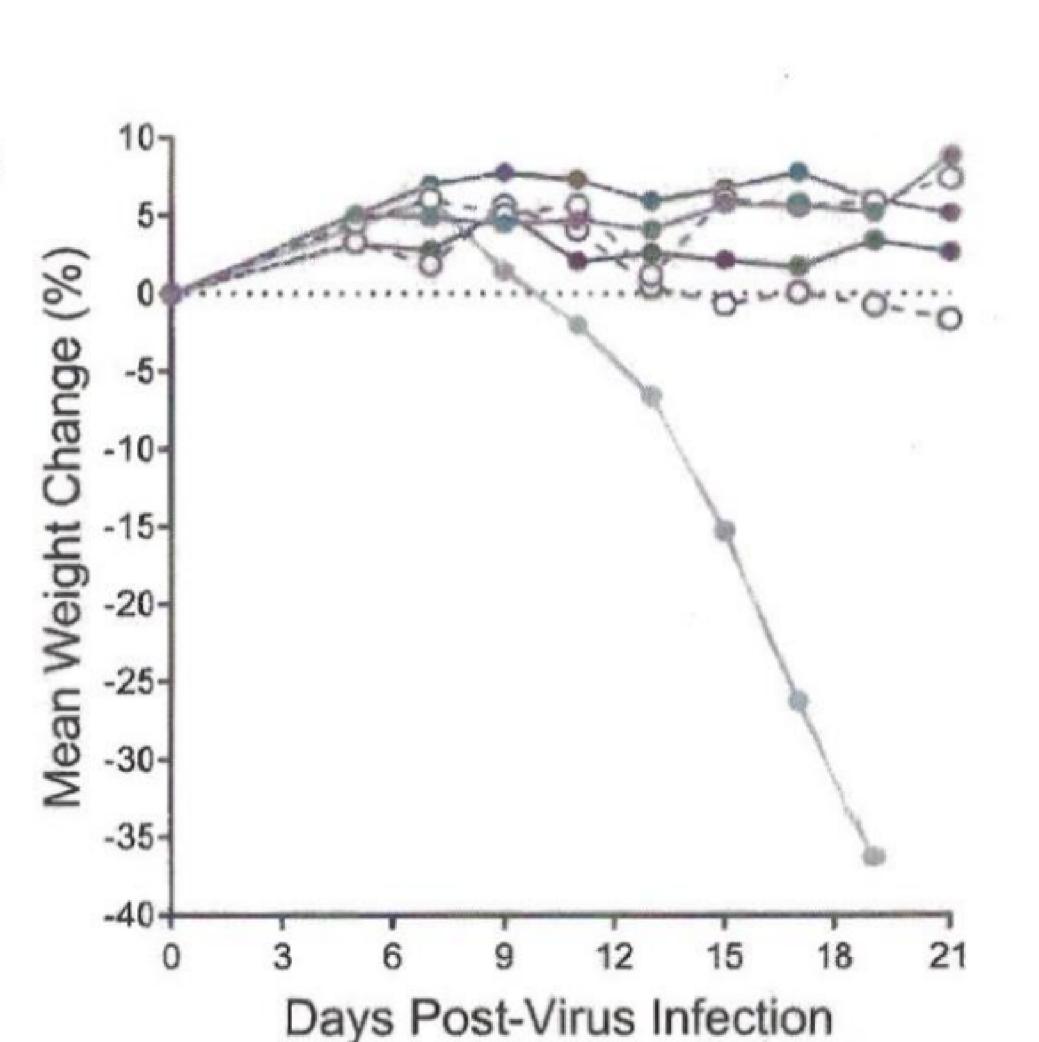


#### Viral Vaccines – mRNA-1325 Up to 100% protection in mice from Zika lethal challenge

#### Study Design:

- AG129 mice dosed with mRNA-1325 (n=10 animals/group)
- Prime (day 0) or prime-boost (days 0, 21)
- Challenged with 100pfu of Malaysian strain at day 42





†10 µg provided 100% protection, even with a single dose.

A 12 -

Publication: Richner J, Himansu S, Dowd KA, Butler SL, Salazar V, Fox JM, Julander JG, Tang WW, Shresta S, Pierson TC, Ciaramella G and Diamond MS. Modified mRNA vaccines protect against Zika virus infection. Cell: February 17, 2017. http://www.cell.com/cell/fulltext/S0092-8674(17)30195-2



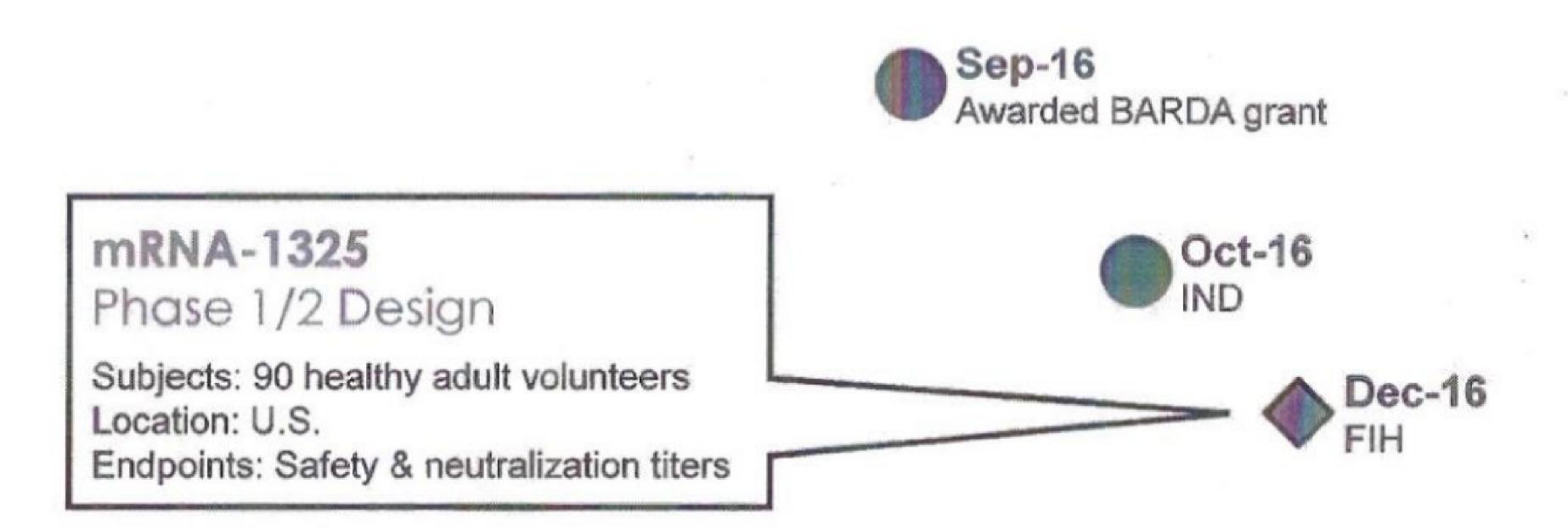
<sup>‡2</sup> μg provided 90% protection; 1 dose provided 60%.

# Our mRNA Approach Allowed us to Move mRNA-1325 to First-in-Human in Less than 1 Year

Q4 '15 Q1 '16 Q2 '16 Q3 '16 Q4 '16

Dec-15
First construct ordered

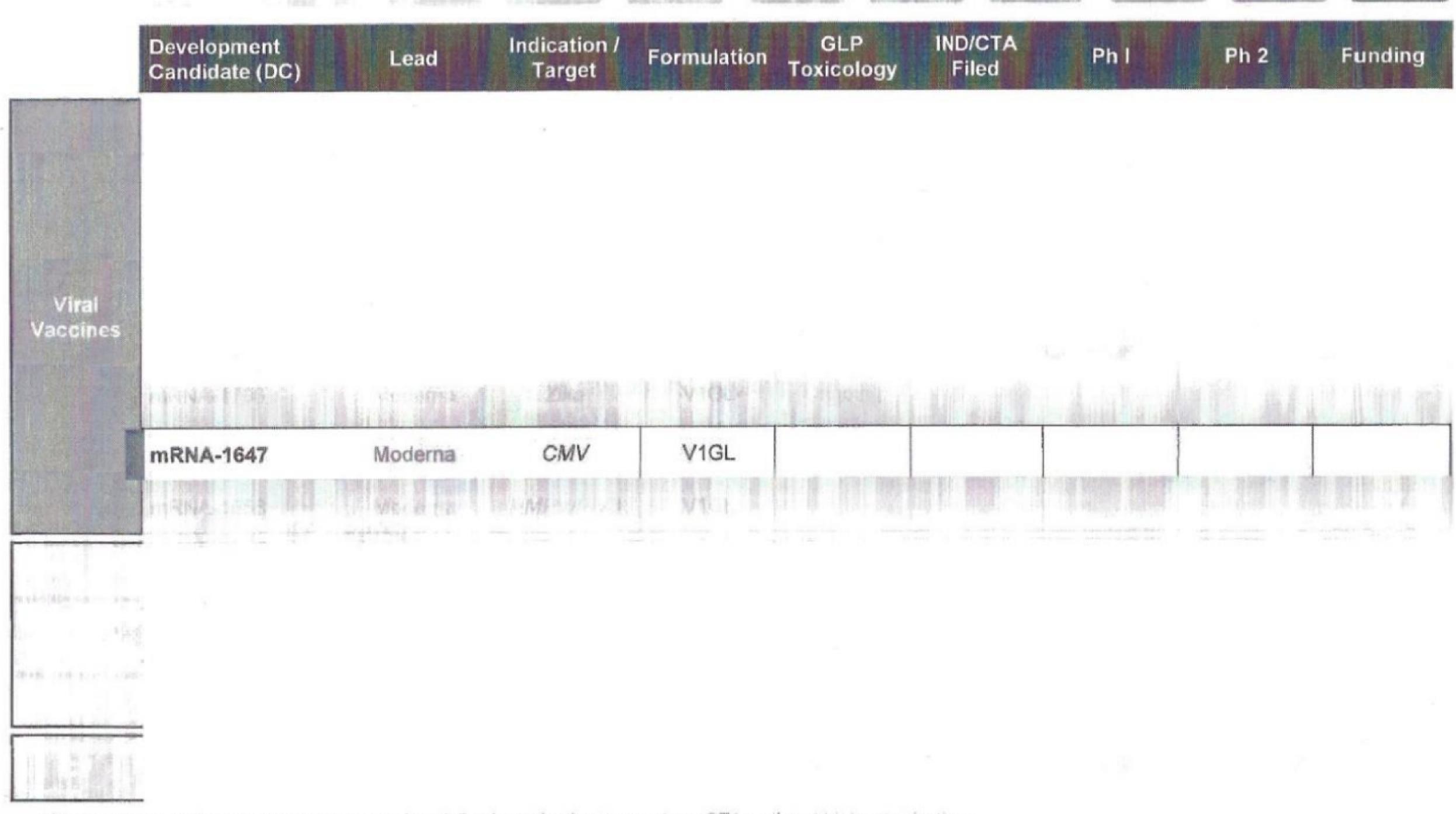
Mar-16
First animal experiment



Abbreviations. GLP = good laboratory practice; IND = investigational new drug; FIH = first-in-human.



### Our Pipeline – Cytomegalovirus (CMV) mRNA-1647

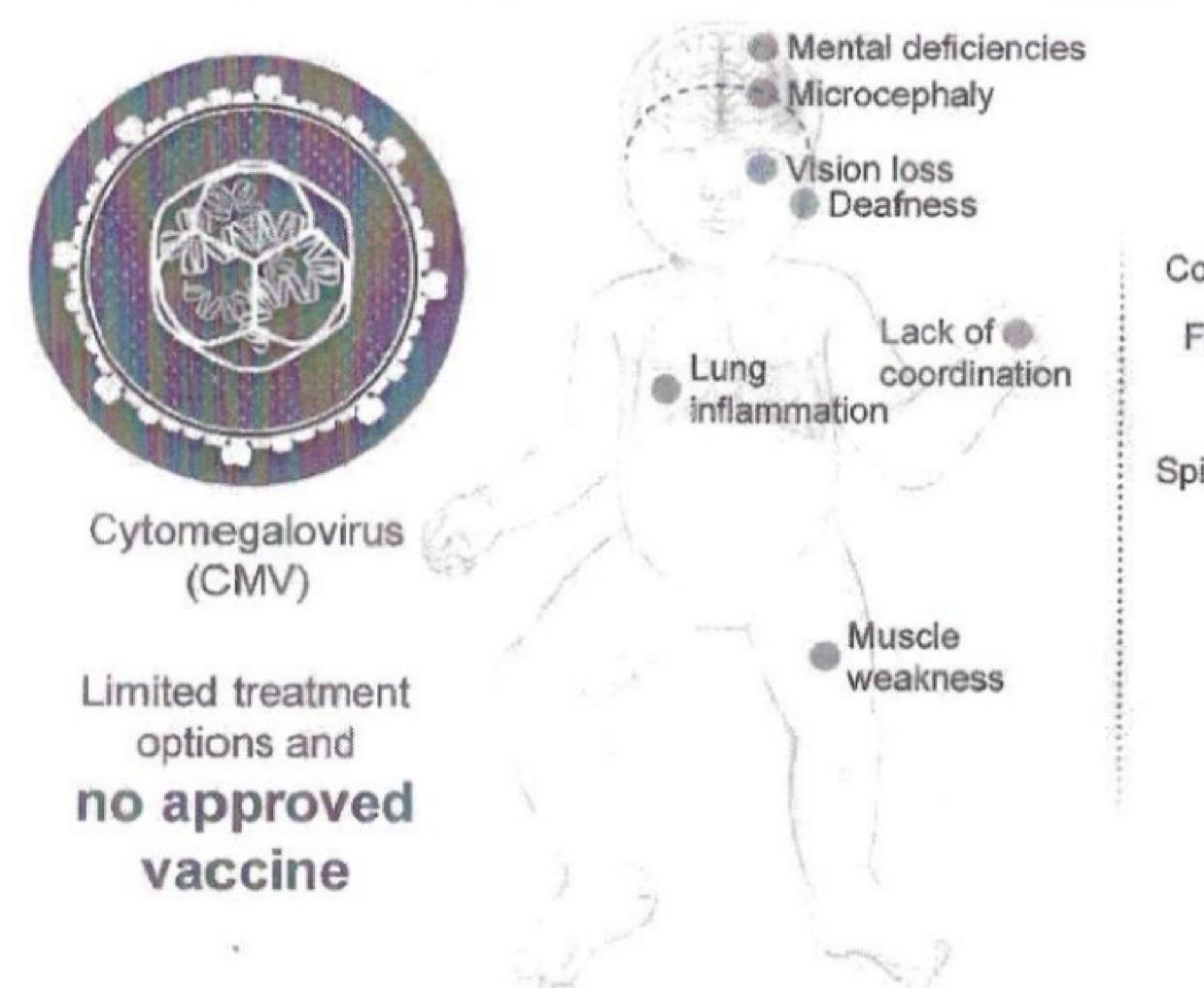


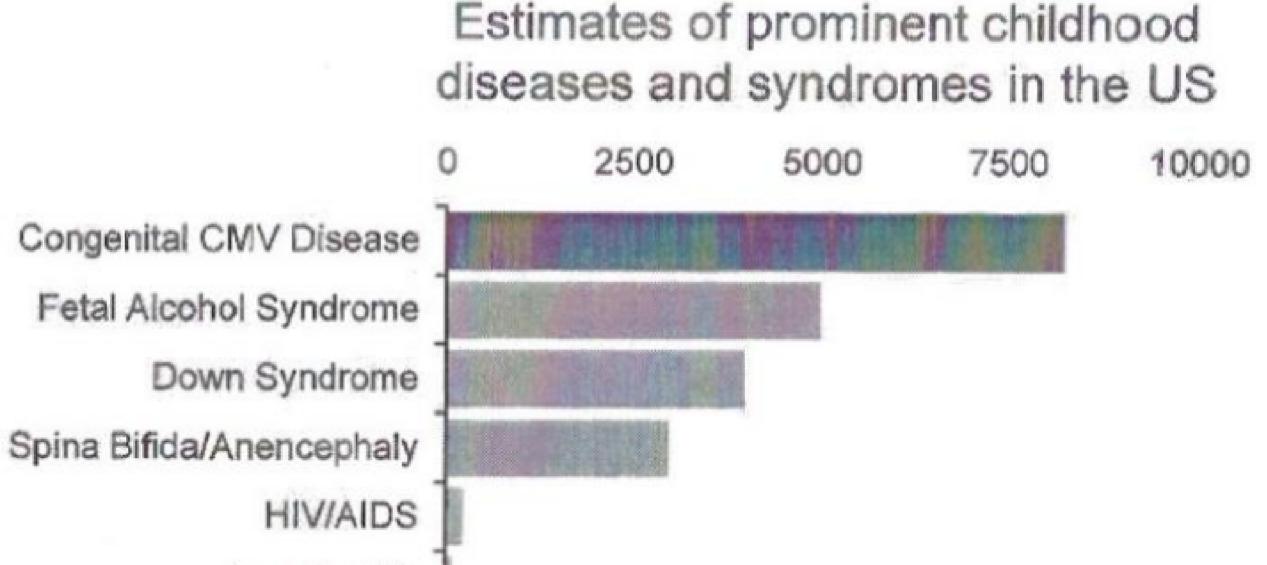
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### Cytomegalovirus Overview (CMV) CMV has high unmet need (congenital and transplant)

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Number of children with long-term sequelae

- Member of the herpes virus family
- Causes severe disease in two key immunocompromised populations:
  - Newborns: most common cause of newborn disability
  - Transplant patients: most frequent viral disease in transplant recipients

 Annual cost \$2 billion in US (Cannon, et al, BMC, 2005)

Invasive Hb

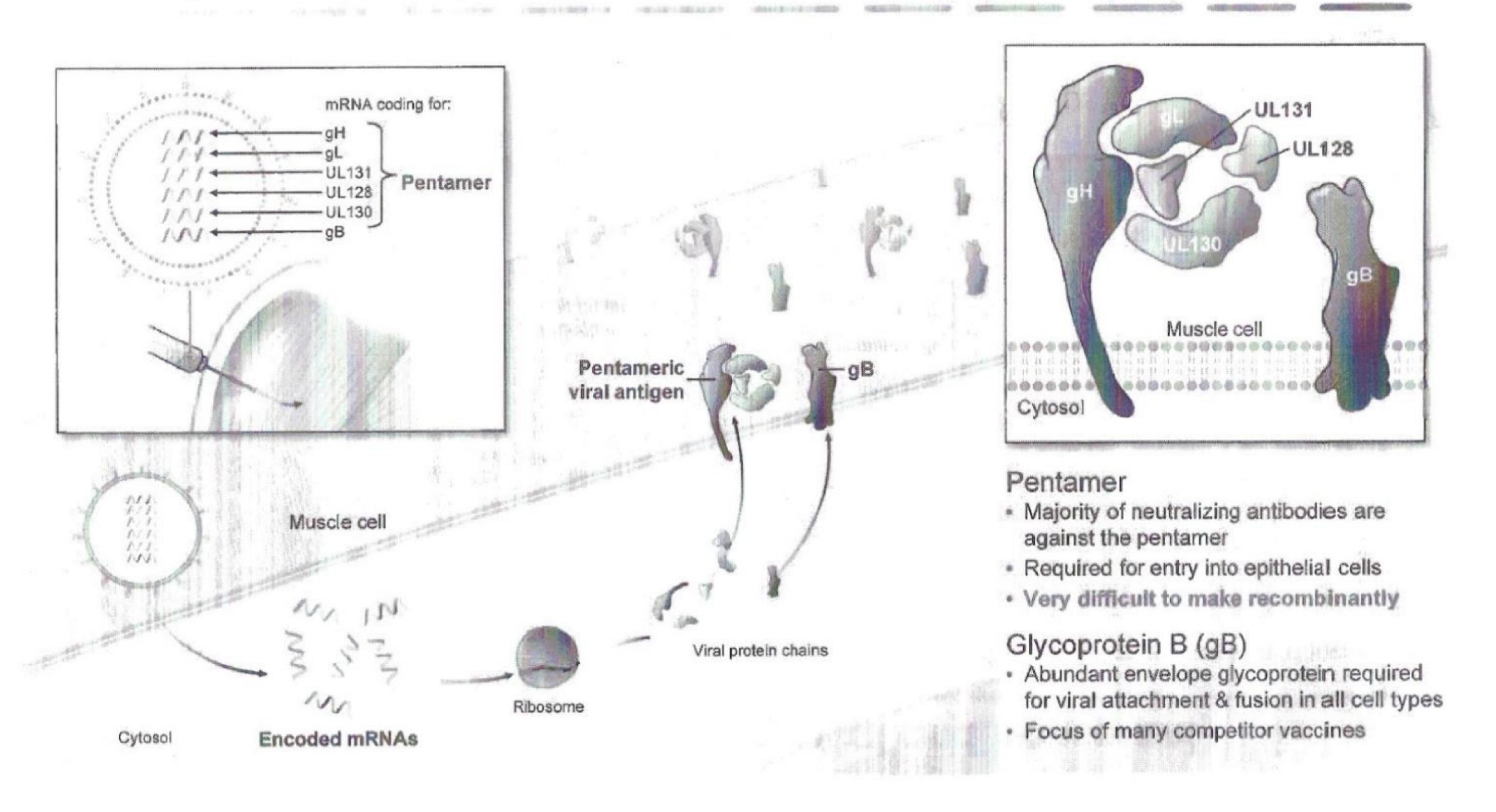
CRS

 US National Academy of Sciences highest priority for vaccine



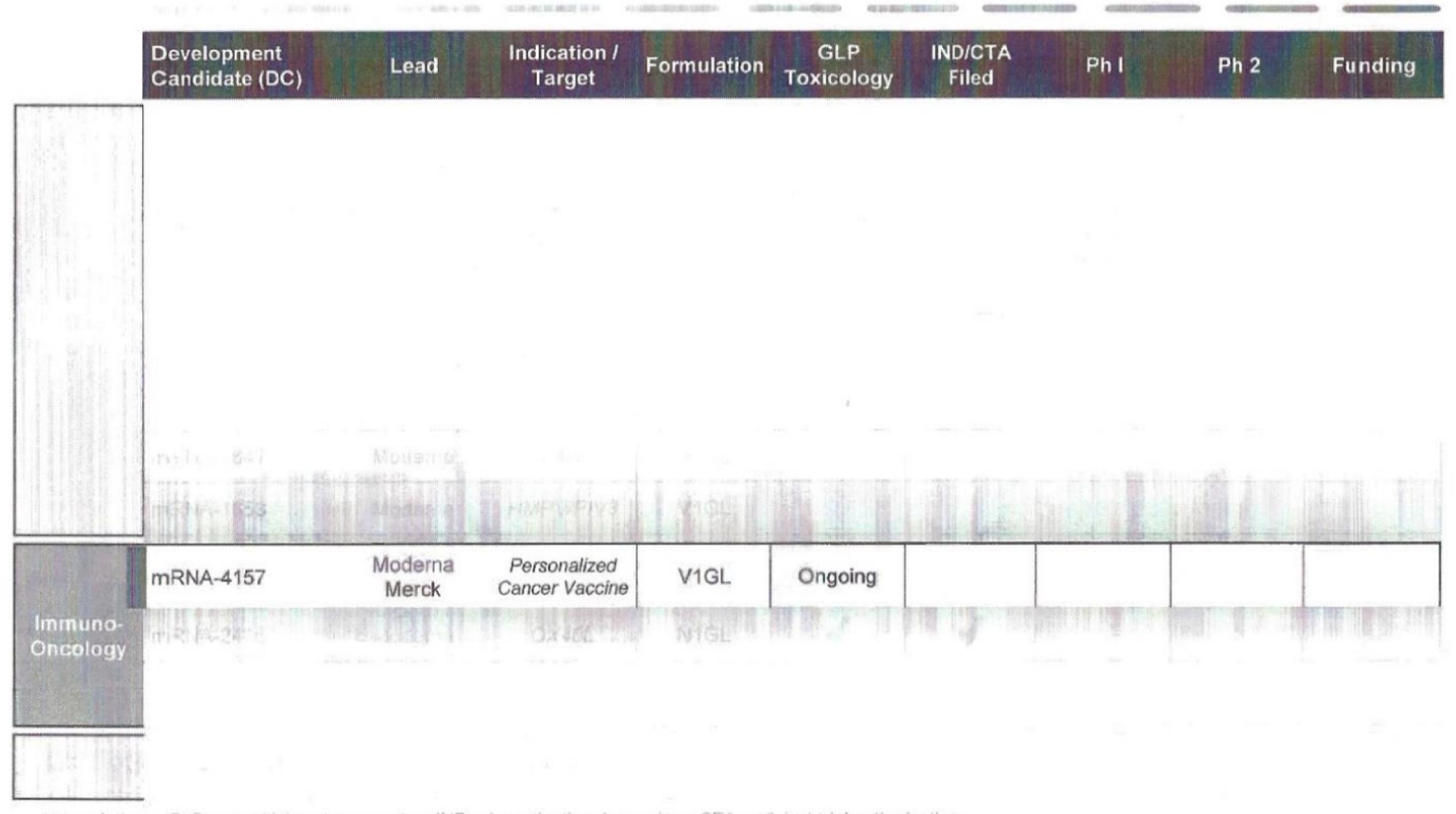
# mRNA-1647 Vaccine for CMV We are combining 6 mRNAs to express a CMV pentamer + gB for infection prophylaxis

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### Our Pipeline - Personalized Cancer Vaccine mRNA-4157

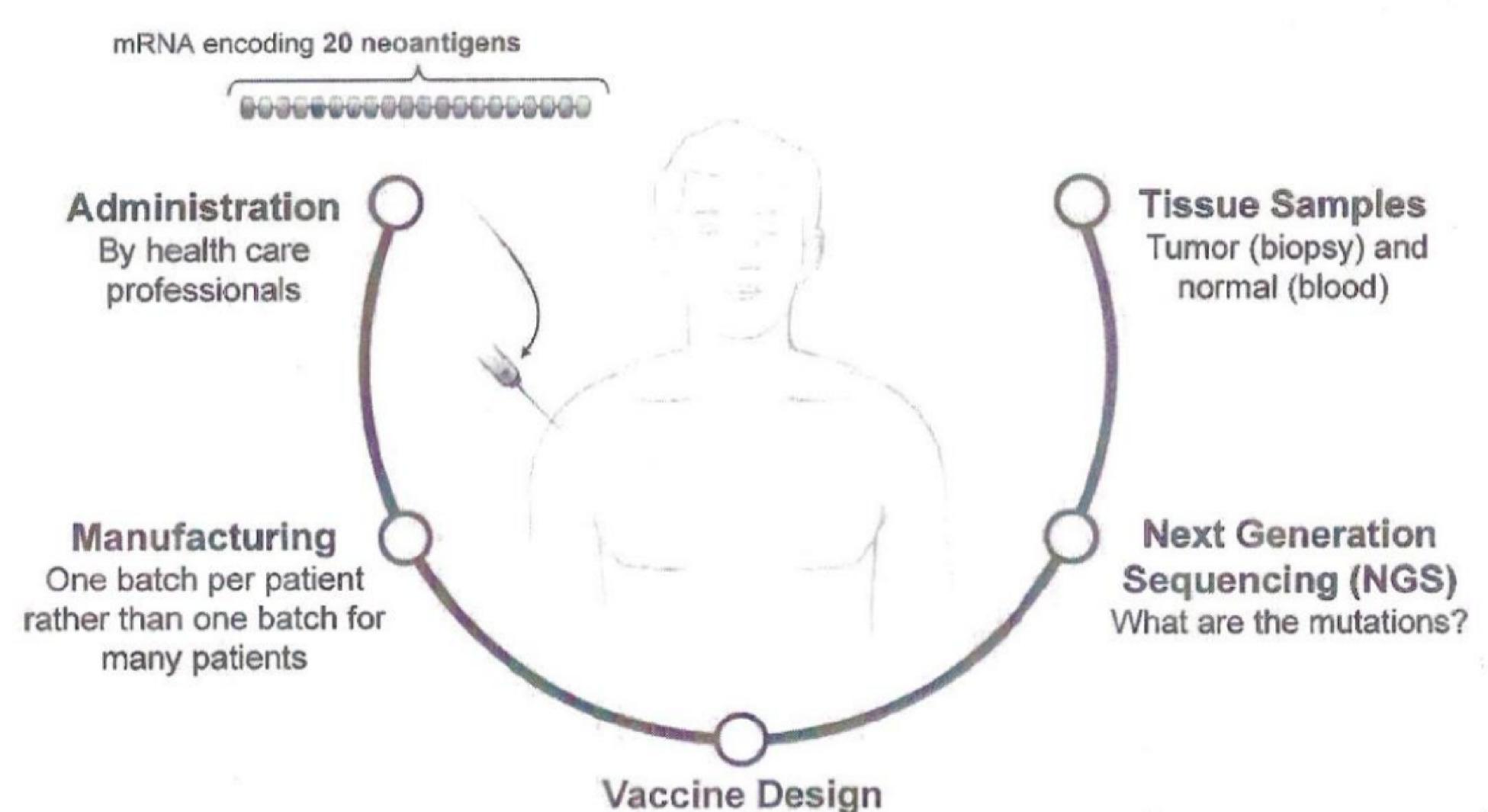


Abbreviations: GLP = good laboratory practice: IND = investigational new drug; CTA = clinical trial authorization; CMV = cytomegalovirus; CV = cardiovascular; HMPV = human metapneumovirus; PIV3 = parainfluenza virus 3; IL-12 = interleukin-12; VEGF-A = vascular endothelial growth factor A.



#### Making a Personal Cancer Vaccine (PCV)

A cancer drug designed to target an individual patient's unique tumor mutations



Which mutations are predicted to be the most immunogenic?
What is the best design for a drug to present these mutations to the immune system?

Target Chain of Custody and Identity
Turn Around Time (TAT) < 30 d



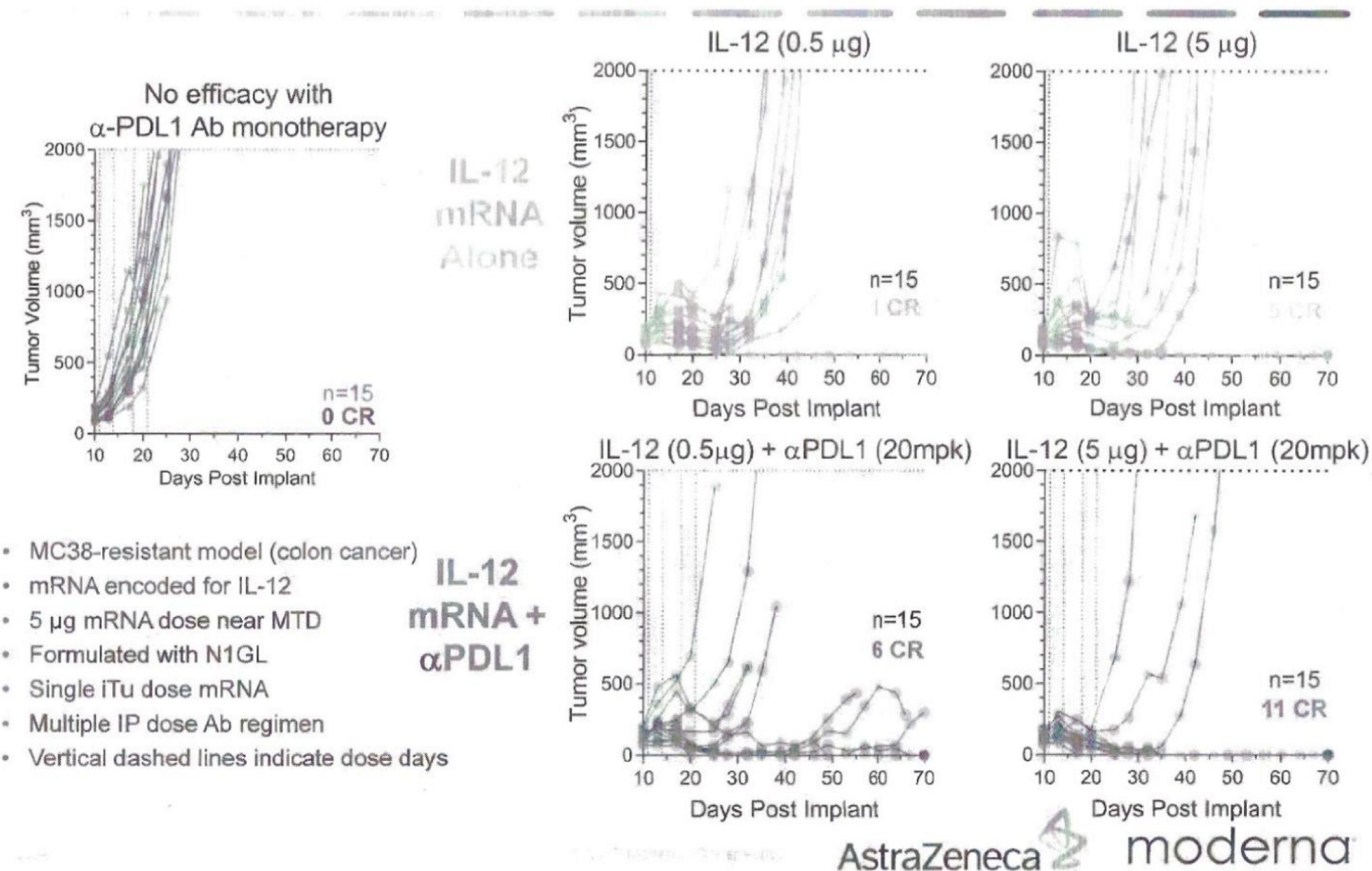
### Our Pipeline – Intratumoral Immuno-Oncology mRNA-2905



Abbreviations: GLP = good laboratory practice, IND = investigational new drug; CTA = clinical trial authorization; CMV = cytomegalovirus, CV = cardiovascular, HMPV = human metapneumovirus; PIV3 = parainfluenza virus 3; IL-12 = interleukin-12; VEGF-A = vascular endothelial growth factor A.



#### Immuno-Oncology iTu – mRNA-2905 Synergistic efficacy with IL-12 mRNA and anti-PDL1 antibody therapy in mice



# Our Pipeline - Cardiovascular mRNA AZD-8601



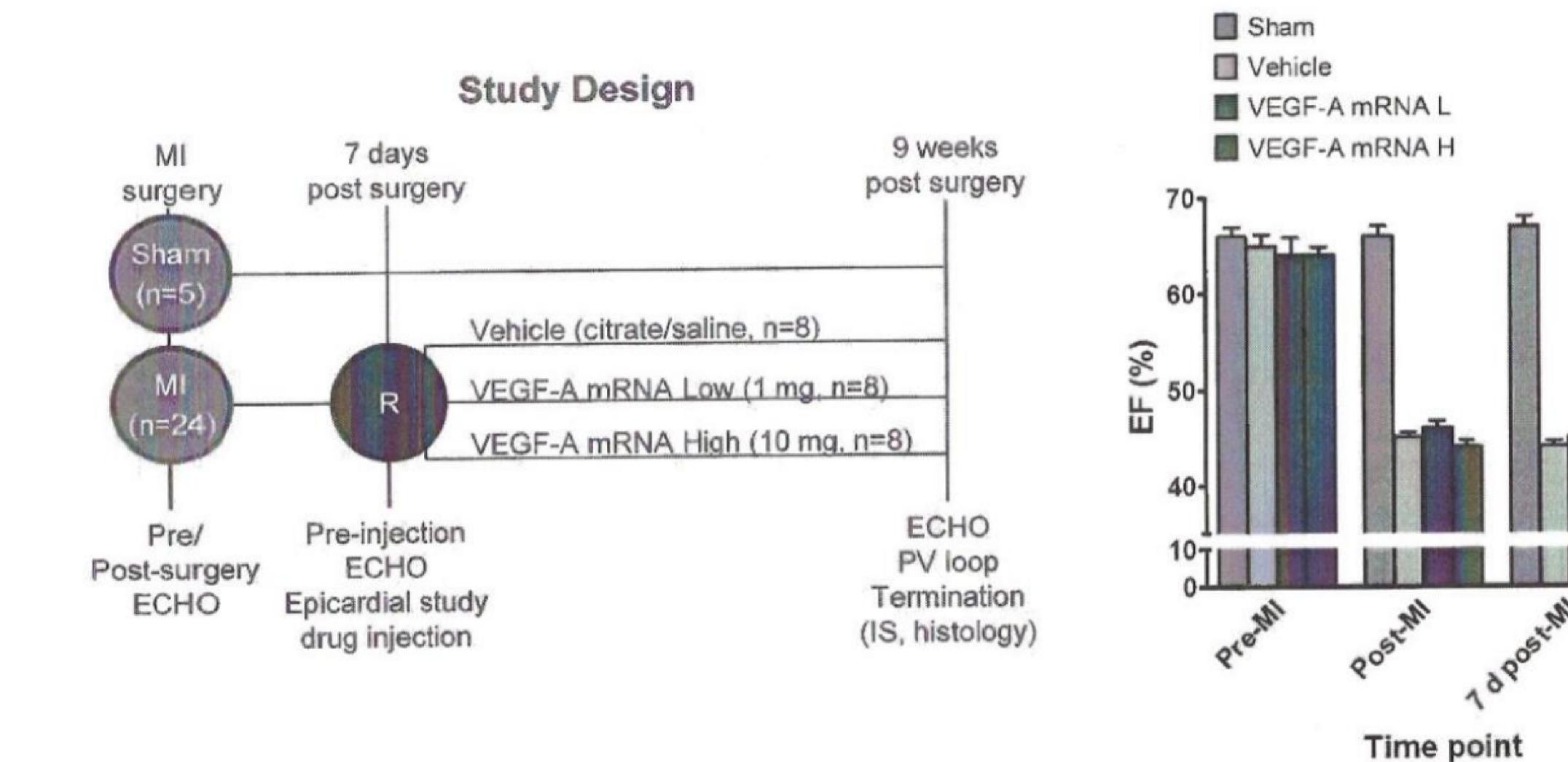
Abbreviations: GLP = good laboratory practice; IND = investigational new drug: CTA = clinical trial authorization; CMV = cytomegalovirus; CV = cardiovascular, HMPV = human metapneumovirus; PIV3 = parainfluenza virus 3, IL-12 = interleukin-12; VEGF-A = vascular endothelial growth factor A.



#### mRNA-8601

elole.

### VEGF-A mRNA partially reverses global cardiac dysfunction when intracardially injected 1 week post-MI in Pigs



Note: EF= ejection fraction (measure of cardiac function). \*p<0.05, \*\*p<0.01, \*\*\*\* p<0.0001 Presented by AstraZeneca at AHA, November 2016.



moderna Financials

### Multiple Financing Sources...

\$ in millions	Founding - 2012	2013	2014	2015	2016	Total
Partnership Upfronts & Technical Milestones	-	\$240	\$100	\$110	\$290	\$740
Reimbursement & Product Milestones	_	\$2	\$6	\$12	\$36	\$56
Equity Issuance	\$39	\$110	\$471	\$56	\$474	\$1,150
Total Sources of Cash	\$39	\$352	\$577	\$178	\$800	\$1,946
Potential Total Grant (yr. awarded)	-	\$22			\$225	\$247
Grand Total Potential Sources of Cash	\$39	\$374	\$577	\$178	\$1,025	\$2,193
Year End Cash	\$22	\$330	\$796	\$802	\$1,307	

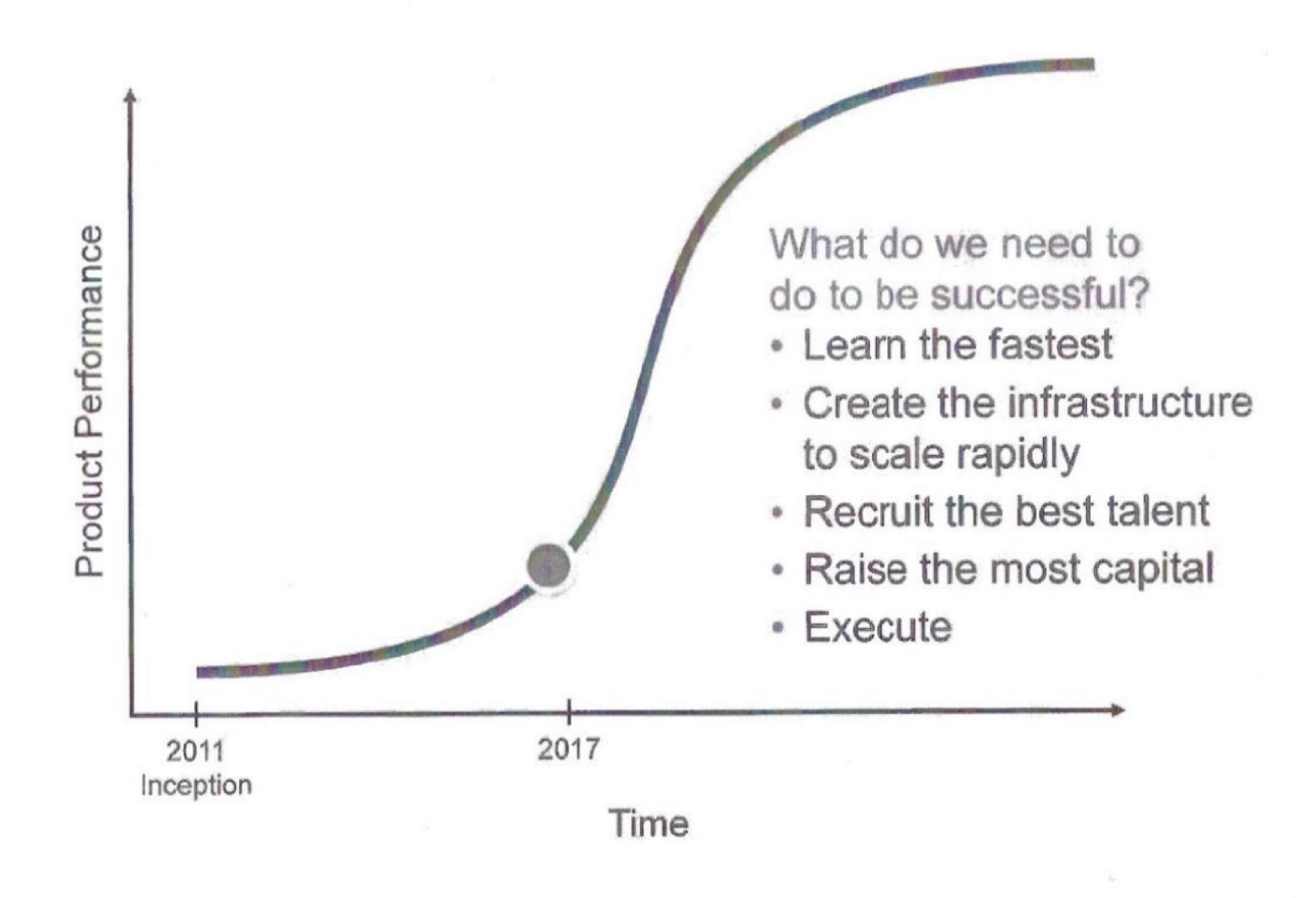
### And a Strong Balance Sheet Positions Moderna for Success

\$ in millions	Founding - 2012	2013	2014	2015	2016E	2017E Budget
Inflows - Reimbursement & Product Milestones		\$2	\$6	\$12	\$36	
Outflows						
Research & Development	\$(8)	\$(24)	\$(61)	\$(124)	\$(225)	
General & Administrative	\$(7)	\$(13)	\$(18)	\$(20)	\$(32)	
Capital Expenditures	\$(2)	\$(4)	\$(17)	\$(28)	\$(39)	
Gross Outflows for OpEx + CapEx	\$(17)	\$(41)	\$(96)	\$(172)	\$(296)	
Net Outflows for OpEx + CapEx	\$(17)	\$(39)	\$(90)	\$(160)	\$(260)	>(\$300)
Year End Cash	\$22	\$330	\$796	\$802	\$1,307	~\$1,000

Note: Cash-based financial information reflected above. Financial statements have been audited through 2015.



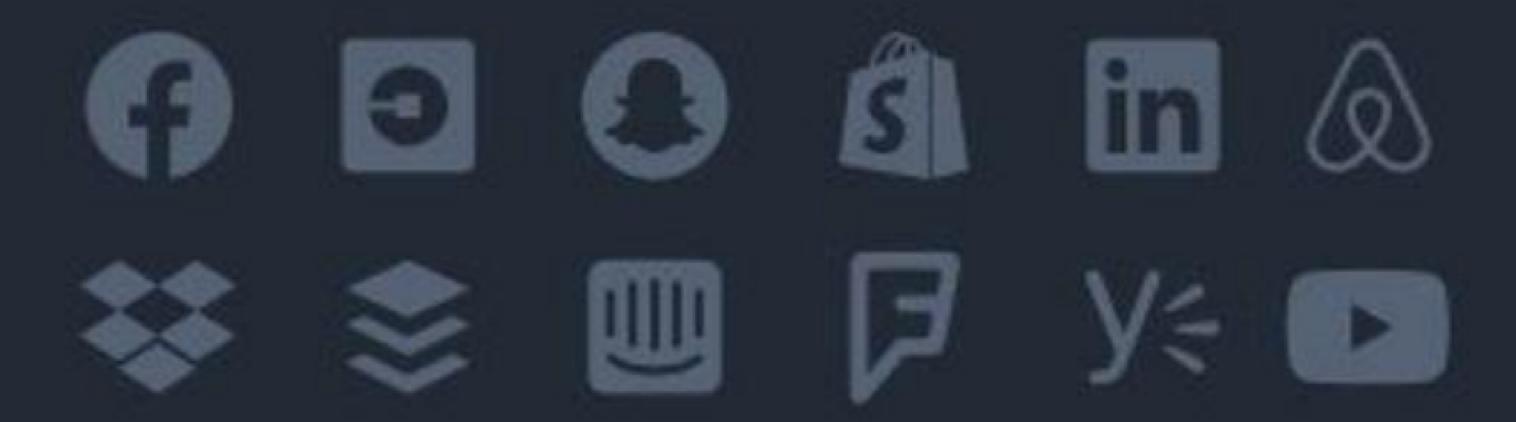
### 2016-2017: Moderna at an Inflection Point We are at the Beginning of a 20 Year mRNA Innovation Cycle





### moderna

Our Mission:
Deliver on the pror
mRNA science to a
generation of trans
medicines for patie



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