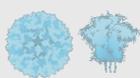


# Flu vaccine program (mRNA-1010, mRNA-1020 & mRNA-1030)

Last program update: January 11, 2021

Modality	ID #	Program		Preclinical development	Phase 1	Phase 2	Phase 3	Commercial	Moderna rights
 <b>Prophylactic vaccines</b>	mRNA-1273	COVID-19 vaccine							Worldwide BARDA funded
	mRNA-1647	Cytomegalovirus (CMV) vaccine							Worldwide
	mRNA-1653	hMPV/PIV3 vaccine							Worldwide
	mRNA-1893	Zika vaccine							Worldwide BARDA funded
	mRNA-1345	Respiratory syncytial virus (RSV) vaccine							Worldwide
	mRNA-1189	Epstein-Barr virus (EBV) vaccine							Worldwide
	<b>mRNA-1010</b> <b>mRNA-1020</b> <b>mRNA-1030</b>	Flu vaccine							Worldwide
	mRNA-1215	Nipah vaccine							Worldwide NIH funded
	mRNA-1644 mRNA-1574	HIV vaccine							Worldwide IAVI/BMGF/NIH funded
	mRNA-1851	Influenza H7N9 vaccine							Worldwide Advancing subject to funding

# mRNA vaccines – Key characteristics and differentiation

## 1. Large product opportunity

- ✓ Ability to do complex antigens
- ✓ Ability to do combination vaccines

## 2. Higher probability of technical success

- ✓ Vaccine mechanism of action (MOA)
- ✓ T-cell response

## 3. Accelerated research and development timelines

- ✓ Time to clinical study/market
- ✓ Uniform process allows for fast scale up

## 4. Greater capital efficiency over time vs. recombinant technology

- ✓ Lower capex
- ✓ Greater flexibility

**Moderna is entering the seasonal flu business**

# Seasonal influenza (flu) overview

- Seasonal flu (type A and type B) epidemics occur seasonally and vary in severity each year, causing respiratory illnesses and placing substantial burden on healthcare systems
- **Disease burden:**
  - Global: The WHO estimates globally about 3,000,000-5,000,000 severe cases of flu each year, and 290,000-650,000 flu-related respiratory deaths<sup>1</sup>
  - US: About 8% of the US population experiences symptoms from flu each year in the US, with 140,000-810,000 hospitalizations and 12,000-61,000 deaths per year<sup>2</sup>
  - Peak flu activity is seen in temperate climates during fall to winter and is reflected in increases in outpatient visits, urgent care visits, and hospitalizations
  - **In the US, the estimated average economic burden of flu is ~\$11 billion per year<sup>3</sup>**
  - Strain mismatch in egg-based vaccine platforms can result in significant loss of vaccine efficacy
- **Unmet need: Currently approved vaccines are ~40-60% effective and face significant challenges from strain mismatch<sup>4</sup>**; high-risk groups would benefit from higher efficacy

Flu symptoms & complications	
<b>Symptoms</b>	Fever Cough Sore throat Nasal congestion Fatigue Vomiting/diarrhea (more common in children)
<b>Complications</b>	Pneumonia (viral and/or bacterial) Ear infections Sinus infections Exacerbation of chronic conditions (e.g. asthma, heart failure)

1. World Health Organization. Influenza (Seasonal). WHO. 2018. [https://www.who.int/news-room/fact-sheets/detail/influenza-\(seasonal\)](https://www.who.int/news-room/fact-sheets/detail/influenza-(seasonal)). Accessed 09 Sep 2020.

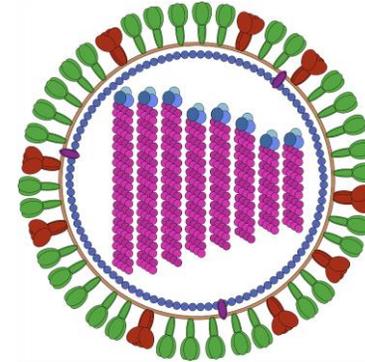
2. Centers for Disease Control and Prevention. Disease burden of influenza. Available at: <https://www.cdc.gov/flu/about/burden/index.html>. Accessed 09 Sep 2020.

3. Putri W et al. Economic burden of seasonal influenza in the United States. *Vaccine* 2018; 36(27):3960-3966.

4. Centers for Disease Control and Prevention. Vaccine Effectiveness: How Well Do the Flu Vaccines Work? Available at: <https://www.cdc.gov/flu/vaccines-work/vaccineeffect.htm>. Accessed 09 Sep 2020.

# Accelerated development of seasonal flu vaccine

- **Target population** Adults
- **Potential for best-in-class product**
- **Moderna concept:** Multivalent vaccine for the prevention of influenza illness caused by influenza
  - First generation flu vaccine will cover the 4 seasonal viruses recommended by the World Health Organization (WHO)<sup>1</sup>
- **Nominating three development candidates (DCs):** Plan to start Phase 1 in 2021 and take one DC into Phase 3
  - mRNA-1010
  - mRNA-1020
  - mRNA-1030



Influenza A H1N1  
Influenza A H3N2  
Influenza B Yamagata lineage  
Influenza B Victoria lineage<sup>2</sup>

1. World Health Organization. Influenza (vaccines). <https://www.who.int/influenza/vaccines/en/>  
2. Nachbagauer R et al. Is a Universal Influenza Virus Vaccine Possible? *Annual Review of Medicine*. Vol. 71:315-327 (Volume publication date January 2020)

# Forward-looking statements

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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 candidate 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,” “estimates,” “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 potential category of medicines, and may never be approved; mRNA drug development has substantial clinical development and regulatory risks 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](http://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.