COVID-19 mRNA VACCINES

mRNA VACCINE COMPONENTS

STABILIZED SARS-CoV-2 SPIKE ANTIGEN
Stabilization of the spike antigen located on the outside of the SARS-CoV-2 virus induces a strong immune response in the body.

mRNA
Single stranded genetic molecule. Encodes “recipe” for the stabilized SARS-CoV-2 spike antigen.

LIPID NANOPARTICLE
“Bubbles of fat” used to transport mRNA molecules into human cells.

Once the mRNA vaccine is delivered, the body makes SARS-CoV-2 spike protein from the mRNA. The immune system remembers this foreign antigen and mounts a protective response when it encounters the SARS-CoV-2 virus.

mRNA VACCINE DEVELOPMENT TIMELINE

1995: First proof-of-concept study proposing mRNA vaccines.

1996-2005


2012: First demonstration of a protective response by an mRNA vaccine.

2013: Stabilization of a respiratory syncytial virus antigen demonstrated increased immunogenicity.

2015: Lipid nanoparticle formulations optimized for mRNA delivery.


2017: MERS-CoV vaccine designed using stabilized spike antigen.

Dec 2019: Novel coronavirus identified from patient in China.

Jan 2020: Genomic sequence of SARS-CoV-2 released.

Feb 2020: First clinical batch of Moderna mRNA vaccine completed.

Mar-Dec 2020: Clinical trials leading to the EUA of Moderna COVID-19 mRNA vaccine conducted.


FDA grants full approval for Pfizer-BioNTech (Aug 2021) and Moderna (Jan 2022) COVID-19 mRNA vaccines.

COVID-19 VACCINATION: BY THE NUMBERS

As of March 2022

577 MILLION vaccine doses administered

2.3 MILLION U.S. lives saved

17 MILLION hospitalizations prevented

$900 BILLION in health care costs averted

For more information, visit: www.niaid.nih.gov/diseases-conditions/coronavirus-vaccines-prevention

1https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total