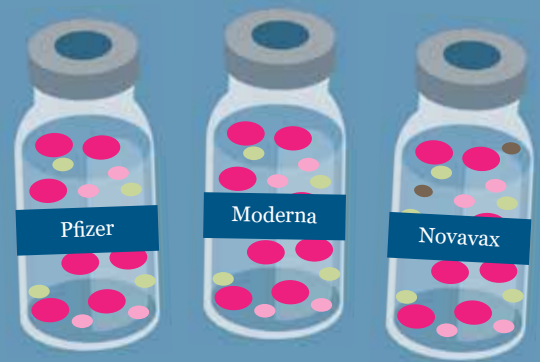


# COVID-19 VACCINES: WHAT'S IN THE VIAL?



## 5 typical components of vaccines:

- Antigens** ●
- Adjuvants** ●
- Stabilizers** ●
- Preservatives** ●
- Residual byproducts** ●

### mRNA vaccines (Pfizer, Moderna)

### Protein vaccine (Novavax)

## ANTIGENS

The active ingredient of the vaccine to which we make an immune response

### messenger RNA (mRNA)

A blueprint that cells use to make proteins; vaccine mRNA is the blueprint for SARS-CoV-2 spike protein

mRNA is processed to make many proteins in cells daily. The cells do not distinguish vaccine mRNA from other mRNA, so it is processed the same way.

### Single protein

SARS-CoV-2 spike protein

This vaccine is made like the vaccines for hepatitis B, HPV and shingles.

## ADJUVANTS

Like morning coffee helps us get a better start on the day, adjuvants help our immune system get a better start against the vaccine.



None

Made from extracts of the soapbark tree (*Quillaja saponaria*)

This is the same adjuvant used in the shingles vaccine.

## STABILIZERS

Like buildings need fortifiers to remain stable over time, so do vaccines.



To protect mRNA:  
Fat-based molecules (called lipids), such as cholesterol

To keep lipids from forming globs with each other: sugar (like we eat)

To maintain safe pH for cells: salts (including table salt), amines and acetic acid (like in vinegar)

To keep the protein stable:  
polysorbate 80 (an emulsifier; also found in ice cream) and cholesterol

To maintain safe pH for cells:  
salts and hydrochloric acid (also made in our bodies and found in some foods)

## PRESERVATIVES

Like gates keep out those who shouldn't enter, preservatives keep pathogens out of vaccines.

None

None

## RESIDUAL BYPRODUCTS

Like a bit of the beach always finds its way home, a small amount of the ingredients used to make the vaccine can end up in the vial, depending on how the antigen is made.



None

Small amounts of ingredients used to produce the vaccine protein, including nutrients and proteins and DNA from the virus and cells in which protein was produced (not human)

## NOT IN COVID-19 VACCINES

- Aluminum
- Animal products
- Antibiotics
- Blood products
- Egg proteins
- Fetal cells
- Gluten
- Human DNA
- Latex
- Microchips
- Pork products
- Soy
- Thimerosal

Find out more:



or  
[vaccine.chop.edu/parents](https://vaccine.chop.edu/parents)  
(Check "Parents PACK Newsletter" June 2023 issue)



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