

# What's in the COVID-19 vaccine?

A full list of ingredients with explanation

## Oxford/AstraZeneca

### ChAdOx1-S recombinant

This is the active part of the vaccine

### L-histidine, L-histidine hydrochloride monohydrate

One of the building blocks of proteins

### Polysorbate 80

An emulsifier

### Ethanol

0.002g in 0.5ml - this is less alcohol than the amount in a slice of bread or a banana

### Sucrose

A sugar

### Sodium chloride, magnesium chloride hexahydrate

Common salts

### Disodium edetate dihydrate (EDTA)

Used in medicine to remove heavy metals, as an anticoagulant and a preservative

### Water

## Pfizer-BioNTech

### BNT162b2 RNA

This is the active part of the vaccine

### ALC-0315

A lipid (fat-like molecule) that acts as a container for the RNA and helps regulate its release

### ALC-0159

A lipid (fat-like molecule) that increases the storage stability

### 1,2-Distearoyl-sn-glycero-3-phosphocholine

A lipid that helps form a stable structure

### Cholesterol

Supports the structure of the fat droplet

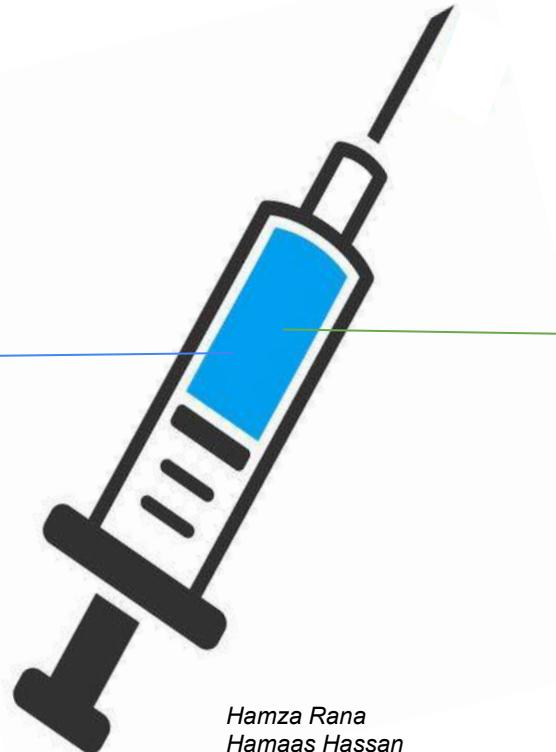
### Potassium chloride, potassium dihydrogen phosphate, sodium chloride, disodium hydrogen phosphate dihydrate

Common salts often used in medicines and food processing

### Sucrose

A sugar

### Water



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## HOW DO VACCINES WORK NORMALLY?

- When we are infected by a virus, our immune system fights against it
- The next time we are exposed to the same virus, memory cells from the immune system act quickly to destroy it
- Similarly, vaccines expose us to a weakened version of the virus or parts of it so we can become immune, but the benefit is that we don't get sick in the first place

### How does the Oxford/AstraZeneca vaccine work?

- The vaccine uses a weakened version of a virus that causes a common cold in chimpanzees
- This has been changed so it cannot make humans ill
- The genes for a part of the coronavirus spike protein are then transferred into the chimpanzee virus
- The body's immune system learns to recognise the spike protein and creates antibodies, which then bind to the actual coronavirus and destroy it

### How does Pfizer-BioNTech vaccine work?

- The vaccine contains mRNA, a molecule the body naturally produces to make proteins
- The body uses this mRNA to produce the coronavirus spike protein, which leads to the formation of antibodies
- mRNA **does not** act on your body's DNA

## HOW WERE THE VACCINES PRODUCED SO QUICKLY?

### 1) Technologies used to create the vaccine were already being developed before the pandemic

- After the Ebola outbreak, Oxford scientists created a 'plug and play' vaccine, which involved taking a virus that infected chimpanzees and altering it so it could be used to fight against almost any other disease
- This type of vaccine had already been used this on 330 people to treat diseases such as the flu, Zika virus, and prostate cancer
- mRNA vaccines like the Pfizer one have been studied for 10-15 years and have been previously used in clinical trials as a treatment for cancer

### 2) Clinical trials were completed rapidly and efficiently

- Usually, there is a long waiting period between each phase of a trial which involves applications, negotiations and recruiting volunteers. These waiting periods can last years
- The desperate need to produce a vaccine meant these waiting periods were considerably shortened and phases of the trials were overlapped
- Also, an unprecedented amount of money was invested to provide the resources needed to complete these trials

### 3) Safety was not compromised

- Both vaccines have been through all three phases of a normal clinical trial
- They had over 30,000 volunteers across many countries and age groups in the phase three trial, which is many times more than a typical trial
- All coronavirus vaccines are safe

## ARE THE VACCINES EFFECTIVE?

### Oxford/AstraZeneca trials

- Data shows that the vaccine provides 70% protection
- Over 20,000 volunteers in the UK and Brazil took part

### Pfizer-BioNTech trials

- The vaccine is roughly 52% effective after the first dose
- After two doses, the vaccine is 95% effective
- Over 43,000 volunteers took part

### For further information

- [Covid: What is the Oxford-AstraZeneca vaccine?](#)
- [Covid vaccine: Pfizer says '94% effective in over-65s'](#)
- [About the Oxford COVID-19 vaccine | Research | University of Oxford](#)
- [Oxford vaccine: How did they make it so quickly? The lightning-fast quest for COVID vaccines — and what it means for other diseases](#)