

16 MAR  
2020

# CHEM VS. COVID TIMELINE

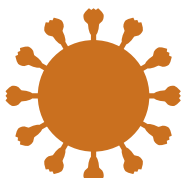
## First COVID-19 vaccine enters Phase 1 trials

### How did prior research help?

#### Work on other coronaviruses

**SARS (2003)**

Severe Acute Respiratory Syndrome



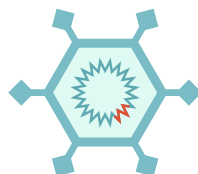
**MERS (2012)**

Middle East Respiratory Syndrome

Development of the COVID-19 vaccines was aided by previous work on SARS and MERS, which indicated vaccines based on the virus spike protein may be effective.

#### Innovations in vaccine technology

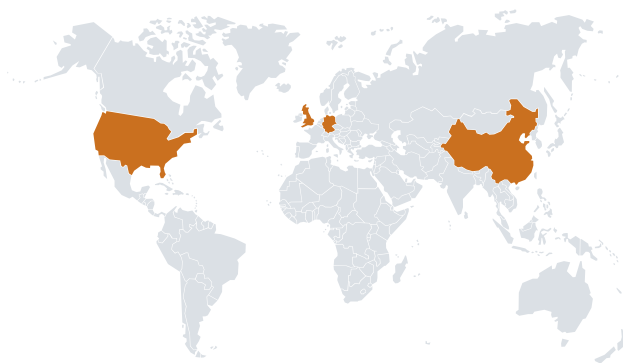
Methods to stabilise RNA and the lipid nanoparticles used to get it into our cells were developed over the past decade.



Scientists started creating viral vectors in the 1980s. Development of viral vector vaccines for other diseases (2000s) helped inform SARS-CoV-2 vaccine development.



**In March 2020, Moderna's mRNA vaccine entered Phase 1 clinical trials to assess vaccine safety. The Pfizer/BioNTech and Oxford vaccines followed afterwards.**



### How did it help?



#### Vaccine safety

The phase 1 trials helped to show that vaccines for COVID-19 are safe. They also allowed common side effects to be identified before wider trials on efficacy.



#### Adapting vaccines

Improved knowledge of the technology used to make these vaccines means we should be able to modify them easily to tackle different strains of the virus.

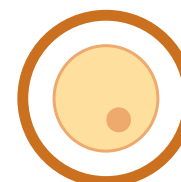


#### Other diseases

Proof that new vaccine technologies such as RNA vaccines are effective may help us develop vaccines for other diseases using similar approaches.

### Pre-clinical and Phase 1 trials

Preclinical trials check that vaccines are safe and produce an immune response.



#### *In vitro* testing

Tests carried out on cells or molecules outside of their usual biological surroundings.



#### *In vivo* testing

Testing in living organisms, allowing efficacy and side effects to be studied.

Phase 1 trials assess the vaccine in a small group of humans, to ensure that it is safe. The immune response to the vaccine can also be evaluated.



#### Who was involved?

Moderna's phase 1 trial included 45 healthy adults (18-55) who got 2 injections of the trial vaccines.



#### What was tested?

Moderna's phase 1 trial tested different doses of the vaccine to determine the optimum effective dose with minimal side effects.