

A General View on COVID-19 Vaccine and its Types

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About The Study

A 'COVID-19' vaccine is a vaccine developed to provide acquired immunity against the virus that causes coronavirus disease, the Severe Acute Respiratory Syndrome Coronavirus 2. Prior to the 'COVID-19' pandemic, there was a well-established body of information about the structure and function of coronaviruses that cause diseases like SARS and Middle East respiratory syndrome. Middle East Respiratory Syndrome-related coronavirus causes MERS, a viral respiratory ailment (MERS-CoV). Symptoms can be minor, moderate, or severe. Fever, cough, diarrhoea, and shortness of breath are common symptoms. Those who have other health issues are more likely to develop the condition. The development of multiple vaccine platforms was hastened as a result of this knowledge in early 2020. SARS-CoV-2 vaccinations were developed with the goal of preventing symptomatic, frequently severe sickness. The genetic sequence data for SARS-CoV-2 was provided through GISAID on January 10, 2020, and the global pharmaceutical sector declared a substantial commitment to address 'COVID-19' on March 19, 2020.

The 'COVID-19' vaccinations have been extensively credited with lowering the severity and death rates associated with 'COVID-19'. Many countries have designed staggered distribution programmes that prioritise persons who are most vulnerable to problems, such as the elderly, as well as those who are most at danger of exposure and transmission.

At least nine alternative technology platforms are being researched and developed in order to build an effective 'COVID-19' vaccine. Because the coronavirus spike protein (S protein) and its variations generate significant B-cell and T-cell immune responses, most vaccine candidates in clinical trials target the S protein as the major antigen of 'COVID-19' infection. Other coronavirus proteins, such as the nucleocapsid, are also being studied for vaccine development since they generate a strong T-cell response and their genes are more conserved and recombine less frequently. Future generations of COVID-19 vaccines, which may target more and conserved genetic areas, will also serve as a safeguard against catastrophic

situations involving the emergence of SARS-CoV-2 or any other Coronavirus epidemic/pandemic.

Nucleic acid technologies, non-replicating viral vectors, peptides, recombinant proteins, live attenuated viruses, and inactivated viruses were among the platforms created in 2020.

Many of the 'COVID-19' vaccine technologies being researched are not like the influenza vaccines already in use, but rather use "next-generation" tactics for precision targeting of 'COVID-19' infection processes. A 2P mutation is used in several synthetic vaccines to lock the spike protein into its prefusion shape, which stimulates an adaptive immune response to the virus before it binds to a human cell.

In-development vaccine platforms may improve antigen manipulation flexibility and effectiveness in targeting 'COVID-19' infection processes in vulnerable population subgroups such as healthcare workers, the elderly, children, pregnant women, and those with weaker immune systems.

mRNA vaccines

RNA has been used to stimulate an immune response in several 'COVID-19' vaccines, including the Pfizer-BioNTech and Moderna vaccines. The vaccine comprises either self-replicating RNA or Messenger RNA (mRNA), both of which cause cells to express the SARS-CoV-2 spike protein when injected into human tissue.

This educates the body how to recognise and destroy the infection in question. RNA vaccines frequently, but not always, use nucleoside-modified messenger RNA. The co-formulation of mRNA into lipid nanoparticles protects the RNA strands and aids their absorption into the cells.

Adenovirus vector vaccines

These vaccines are non-replicating viral vector vaccines that use an adenovirus shell containing DNA that encodes a SARSCoV2 protein. Rather than creating new virus particles, non-replicating virus vector-based vaccinations against 'COVID-19' produce only the antigen that elicits a systemic immune response.

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