

Editorial Note on COVID-19: Coronavirus Vaccines

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Editorial

To finally combat the emerging COVID-19 pandemic, it is necessary to develop an effective and safe vaccine against this highly contagious disease caused by the SARS-CoV-2 coronavirus. There is an urgent need to develop a safe and effective vaccine to prevent this highly infectious disease. Coronaviruses are positively-stranded RNA viruses with its genome packed inside the nucleocapsid (N) protein and enveloped by the membrane (M) protein, envelope (E) protein, and the spike (S) protein-6. While many coronavirus vaccine studies targeting different structural proteins were conducted, most of these efforts eventually ceased soon after the outbreak of SARS and MERS. With the recent COVID-19 pandemic outbreak, it is urgent to resume the coronavirus vaccine research.

A COVID-19 vaccine is a vaccine intended to provide acquired immunity against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus causing coronavirus disease 2019 (COVID-19). Single dose interim use is under consideration in order to extend vaccination to as many people as possible until vaccine availability improves.

Vaccines are dead or weakened virus molecules which are known as antigens that trigger defensive white blood cells in the immune system to create antibodies that bind to the virus and neutralize it. There are four

main types of conventional vaccines: Live vaccines use a weakened form of the virus to prompt the creation of antibodies; inactivated vaccines use a dead version of the virus; toxoid vaccines use toxins made by the virus to produce immunity to the part of the virus that causes disease; and subunit, recombinant, polysaccharide, and conjugate vaccines use proteins or other pieces of the virus.

The rapid development and urgency of producing a vaccine for the COVID-19 pandemic may increase the risks and failure rate of delivering a safe and effective vaccine. Vaccines should progress through several phases of clinical trials to test for safety, effectiveness, immunogenicity, dose levels and adverse effects of the candidate vaccine. Vaccine efficacy is the risk of getting the disease by vaccinated participants in a controlled trial compared with the risk of getting the disease by unvaccinated participants. Vaccine efficacy reflects disease prevention and a poor indicator of transmissibility of SARS-CoV-2 since asymptomatic people can be highly infectious.

While vaccines substantially reduce the probability of infection, it is still possible for fully vaccinated people to contact and spread COVID-19. Public health agencies have recommended that vaccinated people continue using preventive measures such as wear face masks, wash hands, social distance to avoid infecting others, especially vulnerable people, particularly in areas with high community spread.

How to cite this article: Jiang, Shi Wen. "Editorial Note on COVID-19: Coronavirus Vaccines." *J Mol Genet Med* 15(2021): 494.

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Received 20 May, 2021; **Accepted** 25 May 2021; **Published** 30 May 2021