

COVID-19 的概論與疫苗

COVID-19: overview and vaccine

黃立民

台大兒童醫院院長

A new coronavirus, SARS-CoV-2 has caused a pandemic since early 2020. Coronavirus disease-19 (COVID-19) has produced more than 20 million confirmed cases with at least 1 million deaths by Oct, 2020. Regular containment measures appear not able to halt the progress of COVID-19; hence, effective vaccines become urgently needed. More than 150 coronavirus vaccines are in development across the world according to public information—and hopes are high to bring one to market in record time for easing the global crisis. Several efforts are underway to help make that possible, including the U.S. government's Operation Warp Speed initiative, which has pledged \$10 billion and aims to develop and deliver 300 million doses of a safe, effective coronavirus vaccine by January 2021. The World Health Organization is also coordinating global efforts to develop a vaccine, with an eye toward delivering two billion doses by the end of 2021.

The primary aim of COVID-19 vaccine candidates is to induce neutralizing antibody to abort the virus infection. Spike protein of SARS-CoV-2 is the target aimed by most of the vaccines in development. To avoid potential antibody-dependent disease, it may be preferable to include only part of Spike protein instead of the whole one. There are several new approaches making those candidates feasible, including mRNA vaccines, subunit vaccine, and non-replicating adenovirus platform.

Several vaccines have entered phase 3 trial. The front runners are adenovirus vectored vaccines and RNA vaccines. RNA vaccines achieve a protective efficacy of 90-95% and are in clinical use starting late 2010. Adenovirus vaccines and protein vaccines are shown to have efficacies between 50-90%. However, potential escape mutants are emerging. It will take some time to understand if COVID-19 will become influenza-like in the end.