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Editorial

Race for COVID-19 Vaccines

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SARS-CoV-2, the virus which causes Covid-19, uses its surface spike protein to lock onto the ACE2 receptors of the human cells. Once these viruses enter inside, these cells translate the virus's RNA to produce more viruses. This is how coronavirus infection starts. However, specialized antigen-presenting cells engulf these viruses and activated the T-helper-cells. T-helper cells enable other immune responses such as B cells make antibodies to block the viruses from infecting cells and Cytotoxic T cells identify and destroy virus-infected cells. Long-lived memory B and T cells enable to provide immunity to the body for months or years.

A Covid-19 vaccine intends to provide acquired immunity against coronavirus disease 2019. As of August 2020 there are 231 vaccine candidates in development but none has completed clinical trials to prove its safety and efficacy. But Russia has claimed the world's first covid-19 vaccine "Sputnik V" however it is controversial due to lack of information on its clinical trial reports.

All vaccines aim to expose the human body to an antigen that do not cause disease but provoke immune response that block or kill the pathogen if a person becomes infected. Vaccines can be prepared from weakened virus or inactivated virus. The difference between the two is that virus is weakened for a vaccine by passing through animals until mutation to alter its genetic code that makes it less virulent whereas virus is inactivated by using chemicals to render uninfectious. There are also RNA- and DNA-based vaccines which are safe and easy to develop. Viral vector vaccines are also in development with replicating viral vector such as in Ebola vaccines using weakened measles and with non-replicating viral vector such as in covid-19 using adenovirus. Many researchers try to inject coronavirus protein directly into the body. Such vaccines are protein-based and fragments of protein or protein shells that mimic the coronavirus's outer coat can also be used.

As of now few vaccine candidates are in phase 3 clinical trials such as Moderna mRNA-1273, Oxford covid vaccine, Sinopharm, CoronaVac. An early intervention with vaccination can stop the ongoing pandemic of coronavirus infection. Till the production of a safe covid-19 vaccine we should follow the norms of prevention such as wearing mask, frequent hand washing or sanitization and social distancing. We should hope for a covid-19 vaccine with efficacy and safety as early as possible to stop this pandemic.

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