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Letter to Editor

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Dear Editor,

Several months have passed since a mysterious pneumonia was reported in Wuhan, China in late 2019. The novel virus, severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-2), identified as the cause of the disease later named as coronavirus disease (COVID-19), has been spreading globally affecting the lives of millions of people and creating a devastating public health crisis. Without effective treatments and a vaccine, countries worldwide implemented various measures to slow down the spread of the virus and save lives by cancelling all kinds of activities, closing schools and even going into full lockdowns. The COVID-19 pandemic continues to threaten our lives and affecting almost everybody psychologically and/or physically. Efforts are being made to accelerate research on better diagnostic tests, drugs for early and late treatment and hopefully a vaccine. Vaccination has greatly improved public health during last century by reducing the burden of various infection diseases as well as eradication, as in the case of smallpox following successful mass vaccination programmes. Thus, the development of a safe and effective vaccine could offer great promise to quickly reach herd immunity in population and stop global COVID-19 crisis. Scientists across the world have been working hard to develop a successful vaccine after the identification of the virus genome, in January. Governments have been giving financial support to facilitate the development of one or more vaccines. Although the traditional approval process before having the vaccine available in clinic is long and requires critical evaluation of data, efforts are being made to speed up the development cycle of the COVID-19 vaccine. Different types of vaccines using different approaches based on the viral spike protein of coronavirus are being investigated to find at least one successful vaccine that could target the immune system to provoke potent and long-term immune responses. By mid-September, there are more than 150 candidate vaccines under investigation in preclinical research or clinical trials and three vaccines approved for early or limited use. However, as a formulation scientist, I believe that even though it may be possible to have a vaccine available in less than one year, this is very challenging and not easy. A strict evaluation of data must be made enabling the use of a safe and effective vaccine even by the elders who show an age-related decline of the immune system and individuals with secondary diseases who are more susceptible to experience severe side effects.

Although reports from clinical studies have shown the induction of neutralising antibody titers and encourage further development of vaccines, we do not know yet the level of antibodies needed to provide protection and how long the antibodies will last. Moreover, understanding of T cell and B cell immune responses to SARS-CoV-2 is increasing. The occurrence of side effects during clinical testing has been reported as well. Considering the fact that recent studies suggest that immunity of individuals following natural infection could fade within months, detailed attention must be paid on the formulation, any adjuvants used to enhance immune responses and vaccine delivery routes and regimen to achieve clinically successful long-term immunisation. Nevertheless, being optimistic about an optimal COVID-19

vaccine, the challenge remains to produce the vaccine in large scale and prepare a supply chain so that it can be accessible worldwide in a short time.

Our knowledge on COVID-19 disease transmission, diagnosis, treatment and prevention enhances with the ever-increasing number of publications and studies. However, we must not forget that as with many other potential drugs and vaccines reaching clinical trials there is no guarantee that any of candidate vaccines currently under development will prove to be successful. On a more personal level, we must all follow public health measures to prevent the spread of the virus and keep hope that solutions to COVID-19 global health emergency are found very soon.

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