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Letter to the Editor

Development of possible COVID-19 vaccine for elderly

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Dear Editor

According to the Centers for Disease Control and Prevention in the USA, the risk of infection with COVID-19 increases with age, especially in older adults, and those who suffered from other immune diseases or continuously taking medications. Some elderlies are immuno-senescence due to the decline in the immune system's functionality with age, thus, the COVID-19 vaccine may not be effective for them which is big trouble [1,2]. How does the COVID-19 vaccine induce robust immune responses in the elderly?

In general, the number of naive T cells decreases while age increases. This makes the B cells lose their function and less attachment on the antibodies surface result in an inability to defend and target the virus for destruction. Phagocytic cells cannot engulf the virus nor cause inflammation to remove the infected cells [3]. Therefore, it is not easy to develop a suitable COVID-19 vaccine for the elderly.

Pawelec et al. indicated that it must have a biomarker in the elderly, the COVID-19 vaccine. There is an investigation of the Yellow Fever vaccination [4]. Because of the dysfunctional antigen-presenting cells and death of antigen-specific CD4+ Th helper cells, the elderly tend to have a low antibody response. Hence, it is required to identify the protective antigen/epitopes of SARS-CoV-2 for both antibody/B cell responses and T cell responses and better to indicate one of them as a biomarker in the development of COVID-19 vaccine. The purpose of this vaccine designation is to stimulate and increase the level of either T cells or B cells for robust immune responses in the elderly. Besides strengthening the immune response, COVID-19 vaccine could also block the interactions between viral proteins and host cell molecules acting as receptors. This function corrects dysfunctional myeloid cells responsible for acute inflammatory responses in the lung [5].

Recently, there is a potential COVID-19 vaccine called "AZD1222" which was developed by AstraZeneca and the University of Oxford. It is classified as neutralizing type antibodies produced by the B cell and not the T cell. In the clinical trials phase 1 and 2, this COVID-19 vaccine induced at least 56 days of an immune response. However, it is stopped in the clinical trial phase 3 because one volunteer discovered an "unexplained illness". This

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unexplained illness was neurological symptoms confirmed later on not to be related to the COVID-19 vaccination. Therefore, the AZD1222 COVID-19 vaccine re-started in the final investigation now under the Food and Drug Administration (FDA) [6]. Hopefully, this AZD1222 COVID-19 vaccine will be produced successfully at the end of this year, which helps the elderly to prevent and combat the infection of COVID-19.

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All authors contributed to the concept, acquisition, and analysis of data, drafting of the article, and critical revision for important intellectual content.

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