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Improved immunogenicity and memory antibody response from single dose immunization of SARS-CoV-2 RBD entrapped nanoparticles

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The year 2020 has seen the by far the most widespread pandemic due to SARS-CoV-2 which has led to over 145 million cases globally and 3 million deaths at the time of writing this abstract. Emerging in the small city of Wuhan in China in December 2019 it soon spread across the globe. On 30 January 2020, World Health Organisation (WHO) declared SARS-CoV-2 disease as Public Health Emergency of International Concern (PHEIC) 1). Vaccines have been the cheapest and most important medical intervention of human history which saves millions of lives each year. 2). Global efforts to develop an effective vaccine against SARS-CoV-2 are underway. However, still many middle and low income countries have been eluded of the full benefits of vaccination due to various economic and political reasons like cost, low coverage, requirement of multiple doses and dependence on the developed world for vaccine import. Moreover many vaccines that have entered the human clinical trials today are being used on humans for the very first time with no known long term effects along with limited safety and efficacy data. Amongst various types, subunit vaccines are the safest, involving no hazardous reagents and no risk of genetic integration. We used RBD of SARS-CoV-2 as the antigen for vaccine against COVID-19. However, unlike any pure antigen it was also weakly immunogenic and required the use of multiple doses. As antigens in particulate nature exhibit increase uptake by antigen presenting cells thus potentiating the immune response. 3) We sought to increase the immunogenicity of RBD by entrapping the protein in polymer particulate system. Delivering RBD as polymer particle vaccine not only increased the immunogenicity but also gave an added advantage of conferring long lasting memory from single point immunization.

Biography

Rahul Ahuja has his expertise the area of protein purification and polymer based particulate vaccines. He has been involved in the development of particle based vaccines for various infectious diseases like pneumonia and COVID-19. He has been working at Product Development Cell in National Institute of Immunology, New Delhi where he is enrolled as a PhD scholar under the guidance of Dr. Amulya K Panda.

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