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Boost Immunity to Track the Coronavirus if Some Modifications in its Structure have Occurred

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Introduction

The emergence of Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) in 2003 and Middle East Respiratory Syndrome Coronavirus (MERS-CoV) in late 20121, we need to develop a universal vaccine able to boost immunity to track the coronavirus if some modifications in its structure have occurred by itself, this is what we are dealing nowadays with a virus capable of mutating its structure, while the immunity is standing still paralyzed facing the virus. Here, we report the preclinical trials of (CRCx3) and (CRCx2) vaccine candidate in inducing a high level of positive neutralizing antibodies as well as a cellular immune response in animal model to provide protection against SARS-CoV-2. Three-dose immunizations using 0.25 ml of (CRCx) vaccines with a 25 mm needle for three successive injections in 7days interval provided highly efficient protection against SARS-CoV-2. In addition, (CRCx) vaccines candidate exhibits efficient productivity and good genetic stability for vaccine manufacture. These results support the further evaluation of (CRCx) in a clinical trial.

Viral Antigens

COVID-19 is caused by a new positive-strand RNA Coronavirus (SARS-CoV-2), which belongs to the Coronaviridae family, along with the Severe Acute Respiratory Syndrome (SARS) and the Middle East Respiratory Syndrome (MERS) coronavirus. Their genome encodes several major structural proteins and non-structural, including membrane (E), Spike (S), envelope (M), and Nucleocapsid (N) proteins, approximately 16 nonstructural proteins (nsp1–16), and five to eight accessory proteins. Among them, the S protein plays an essential role in viral attachment, fusion, entry, and transmission. S protein is abundant and highly expressed however, due to its biological function; it seems to be unlikely that antibodies against NP have neutralizing activity. Most of the recent vaccines for COVID-19 that employ injection of viral antigens or viral gene sequences aim to induce neutralizing antibodies against the viral Spike protein (S), preventing uptake through the human ACE2 receptor and, therefore, blocking infection. Neutralizing antibodies elicited by prior infection or vaccination are likely to be key for future protection of individuals and populations against SARS-CoV-2. Moreover, passively administered antibodies are among the most promising therapeutic and prophylactic anti-SARS-CoV-2 agents. However, the degree to which SARS-CoV-2 will adapt to evade neutralizing antibodies is unclear. The previous reports provided us the evidence that neutralizing antibodies are potent enough to prevent viral infection, and strongly suggest that neutralizing-antibody-based vaccines could provide effective protection against coronavirus and the antibodies can constitute a promising cornerstone for the efficacy of an effective vaccine against any viral infection. But we concluded that neutralizing antibodies could carry a pathogenic role controversial to its protective one and the coronavirus can use these nAbs to mask a proportion of corresponding antigens in immune-complex form (Ag/nAbs) antigen/ neutralizing antibody for a long time preventing its attacks by CD8+ cytotoxic T cells. Based on our assumption we discussed the possibility of developing a new *in vitro* vaccine comprising of peptide combination Ag/non-specific Abs as extrinsic immune-complex (ICA, ICB and ICC) completely dissimilar than the existing intrinsic circulating immune complex that comprise coronavirus antigen (M, N and S and its specific neutralizing antibody as (IC1, IC2 and IC3) as circulating immune complex. Vaccine candidate is an immune peptide combination that was created to act as a novel therapeutical intervention for curing and preventing coronavirus infection. By coupling (Ag/nonspecific Abs) in one form differs from the already existed intrinsic Circulating Immune-Complex (CIC) that share (Ag/ specific abs).

Thrombosis with Thrombocytopenia

The Development of preventive and therapeutic vaccine with high immunogenicity and safety is crucial for control of the global COVID-19 pandemic and prevention of further illness and fatalities. Different types of conventional vaccines inter the race aiming to gets a highly and safely results, one of them use whole viruses to trigger an immune response 8, 9, sub-unit vaccines use pieces of the pathogen often fragments of protein to trigger an immune response nucleic acid vaccines use genetic material either RNA or DNA to provide cells with the instructions to make the antigen. In the case of COVID-19, this is usually the viral spike protein. Once this genetic material gets into human cells, it uses our cells' protein factories to make the antigen that will trigger an immune response. The advantages of such vaccines are that they are easy to make, and cheap. Since the antigen is produced inside our own cells and in large quantities and the viral vector vaccines also work by giving cells genetic instructions to produce antigens, and it has been reported that the probabilities of reinfection after the use of vaccines with their diversity have not been resolved or prevented, also more reports were recorded the possibilities of growing a serious side effects after the first and second doses like; Thrombosis with Thrombocytopenia Syndrome (TTS) after Johnson COVID-19 vaccination, myocarditis, or pericarditis among people ages 30 and younger who received COVID-19 vaccine. Most cases have been reported after mRNA COVID-19 vaccination (Pfizer-BioNTech or Moderna), particularly in male adolescents and young adults, in the United States from December 14, 2020, through October 6, 2021. During this time, VAERS received 8,638 reports of death (0.0021%) among people who received a COVID-19 vaccine, severe allergic reactions, including anaphylaxis, can occur after any vaccination. The most majority of approved vaccines were traditionally focused on the induction of strong protective neutralizing antibodies against the target pathogen, thus aiming to confer sterilizing immunity in vaccinated individuals and provide long-term immunity to protect the body from the risk of infection or recurrence. According to our postulation, the broadly neutralizing antibody that are generated

during vaccination, exist in two forms, a bound positive form where it effectively masks a proportion of corresponding coronavirus antigen structural and a nonstructural protein in complex form prevents its elimination, controlling its activities and a free negative form which is a non-functional non neutralizing abs. This immune complex formation can explain the cause of persistence of the viral infection. The previous reports denoted to the importance of immune complex as inflammatory mediator's stimulants, Immune-complex rises when the body's immune system generates antibodies against antigenic determinants of host or foreign substances that recognize and bind to the antigen molecules an immune-complex is formed which comprises this neutralizing Abs complex.