## Immunization with Sars-Cov-2 Nucleocapsid Protein Triggers a Pulmonary Immune Response in Rats

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## Abstract

Coronavirus infection disease 2019 (COo#4A0019 (COo#4R0019 (COo#4fR)fcT TJp050044005004004806004C0046011000330002F04

e SARS-CoV-2 is the seventh member of the coronavirus famil able to infect the human beings. In this famil the SARS-CoV (responsible for the severe respirators sendrome outbreak in China, in 2003), MERSCoV (from the Middle East respirators sendrome in 2012) and the new SARS-CoV-2 subtepes can cause serious illness in humans, while the subtepes HKU1, NL63, OC43 and 229E are associated 27th milder presentations. SARS-CoV-2 is an ssRNA-virus, e ternall\( protected b\( a \) a spherical-shaped phospholipid envelope of about 125 nm of diameter, covered by glocos lated Spike proteins (SP), which promote the chemical a nits of the virus to the mammalian cells. SARS-CoV-2 binds the host cell through the interaction bet een its SP and the trans membrane isoform of the angiotensin-converting en me 2 (ACE2) of host cells, that serves as a receptor, mediating viral entra. e SARS-CoV-2 genome consists of appro imatel 30,000 nucleotides, Which encode the structural viral proteins; SP, Envelope protein (EP), Membrane protein (MP) and Nucleocapsid protein (NP), associated 12 ith protein units of NP, 12 hich in turn regulates viral replication. SARS-CoV-2 seems to be less lethal than the SARS-CoV or the MERS-CoV, but more infectious, Which could contribute to its pandemic potential [5-8].

With the rapid spread of COVID-19 throughout the Borld, the development of vaccines against SARS-CoV-2 became necessard and urgent. Vaccines contribute to the development of immunological memors, thus minimizing the e ects of infectious diseases, in a second e position to the pathogen. Pathogen attenuation or inactivation, as Bell as the production of recombinant bacterial/

viral-derived proteins are among the most employed biotechnology strategies for the production of vaccines. Such elements stimulate both cellular and humoral adaptive immune response of the host, triggering the synthesis of specie cantibodies against the pathogen, thus preparing it for future infections [9]. Immunikation through the vaccines is one of the most elective strategies for the prevention of infectious disease, and have being applied very successfully over the last decades, since it protects not only the patient who receives the immuniking agent, but the whole community, as the immuniked person is unlike to become a vector of transmission to other people. e greater the number of people immuniked, the lower the chances of a disease develops and becomes pandemic.

Based on this assumption, research centers all over the planet, as well as pharmaceutical industries, public and private bodies have been rorking incessant on the development of immunifers against SARS-CoV-2 since the beginning of 2020. Current a number of di erent vaccines against COVID-19 are alread in emergence use, although the potential of immunifing action of each of these products, as well

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as the possible side e ects that make be caused by them, have not been completely clarified. Moreover, in spite of the recent increase in the number of immunified people around the world, some countries are still sufering from the scarcity of available vaccines. The perimental and pre-clinical studies are still required to provide more details on the physiological mechanisms of immunification, and to contribute to the development of further immunifiers against SARS-CoV-2.

Taking the above into consideration, the aim of the present stud® are to verif® the e ects of the application of a recombinant protein derived from the viral NP of SARS-COV-2 virus, carried out b® our research group through the culture of genetical® modi ed bacteria, in 2 di erent strains of rats