

Live attenuated SARS-CoV-2 vaccine candidate adaptable to emerging SARS-CoV-2 variants

Technology Summary

This technology includes a rationally designed live attenuated SARS-CoV-2 vaccine (LIV) candidate that has demonstrated effectiveness against Wuhan-1, Delta, and Omicron variants in animal studies. In addition, it allows the production of variant-specific, attenuated SARS-CoV-2 viruses expressing modified vaccine antigens that will be useful to prevent infection by future SARS-CoV-2 variants.

Attenuation of SARS-CoV-2 is achieved by three genetic modifications: removal of the polybasic cleavage site in the spike protein, removal of the open reading frames (ORFs) 6-8 from the viral genome, and the introduction of a pair of mutations into the non-structural protein 1 (Nsp1). These genetic modifications reduce infection of the lung, reduce inflammation and interferon antagonism, and alleviate Nsp-1-mediated cell toxicity while still providing immunity to SARS-CoV-2 in Syrian hamster model.

Live attenuated virus-based vaccines can be administered intranasally and may improve the overall immune response to infection because it is more likely to induce a cellular immune response in addition to a broader humoral immune response than intramuscular vaccinations. Additional advantages may include the ability to induce stronger mucosal immunity, which significantly reduces virus transmission, as well as the flexibility to generate attenuated vaccine virus against emerging SARS-CoV-2 variants.

Potential Commercial Applications

- Development of SARS-CoV-2 vaccines
- A vaccine platform to address public health needs associated with emerging SARS-CoV-2 variants

Competitive Advantages

- Broader humoral and cellular immune responses at the mucosa
- Intranasal administration
- Platform for addressing emerging SARS-CoV-2 variants

Development Stage: Proof-of-concept, vaccine challenge studies in transgenic mice and in Syrian hamsters, and vaccine candidate

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Intellectual Property: U.S. provisional application 63/348,850 was filed June 3, 2022

Product Area: Vaccine development, candidate SARS-CoV-2 vaccine

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