

I BEST OF THE WEEK (19 giu – 02 lug 2023)

Zhenzhen Wang et al.

A SARS-CoV-2 and influenza double hit vaccine based on RBD-conjugated inactivated influenza A virus

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Abstract

The circulating flu viruses merging with the ongoing COVID-19 pandemic raises a more severe threat that promotes the infectivity of SARS-CoV-2 associated with higher mortality rates. Here, we conjugated recombinant receptor binding domain (RBD) of SARS-CoV-2 spike protein onto inactivated influenza A virus (Flu) to develop a SARS-CoV-2 virus-like particle (VLP) vaccine with two-hit protection. This double-hit vaccine (Flu-RBD) not only induced protective immunities against SARS-CoV-2 but also remained functional as a flu vaccine. The Flu core improved the retention and distribution of Flu-RBD vaccine in the draining lymph nodes, with enhanced immunogenicity. In a hamster model of live SARS-CoV-2 infection, two doses of Flu-RBD efficiently protected animals against viral infection. Furthermore, Flu-RBD VLP elicited a strong neutralization activity against both SARS-CoV-2 Delta pseudovirus and wild-type influenza A H1N1 inactivated virus in mice. Overall, the Flu-RBD VLP vaccine is a promising candidate for combating COVID-19, influenza A, and coinfection.