

New COVID-19 booster vaccine offers high level of protection in mice

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Credit: Ministry of Health

A preclinical study evaluating a Kiwi-made COVID-19 vaccine—Kiwi Vax—has shown its unique formulation induces a safe and highly effective immune response to SARS-CoV-2 variants of concern, making it a promising booster vaccine candidate.

Published in *iScience*, the study findings show that Kiwi Vax, developed

by Vaccine Alliance Aotearoa New Zealand—Ohu Kaupare Huaketo (VAANZ) as part of the Government's COVID-19 vaccine strategy, is highly immunogenic, robustly expressed, and has a strong stability profile. The vaccine was independently tested at the National Institutes of Health in the United States and at the University of Melbourne.

"These findings not only show we have developed a promising booster vaccine candidate, but that we have the expertise, capability and experience within New Zealand to make our own vaccines—something that stands us in good stead for future pandemics," says the Malaghan Institute's Dr. Kjesten Wiig, Executive Director of VAANZ.

"COVID will be with us for many more years to come, so having safe and effective booster options, particularly for vulnerable populations, will help keep more people safe from the virus."

Kiwi Vax is a protein-based vaccine which works in a similar way to many traditional vaccines, using genetic information from the virus's distinct spikes.

Dr. Lisa Connor, head of VAANZ's Vaccine Evaluation team says their subunit vaccine combines two different parts of the spike protein—the receptor binding domain and the N terminal domain. These specific regions have been identified to contain "hot-spots" that trigger potent immune responses against critical areas of the SARS-CoV-2 virus required for infection.

"Kiwi Vax has a unique set of attributes—its clean design does not attract extraneous immune responses, and it is designed to be specific to the virus. It elicits a broad antibody and T-cell response to all variants of concern, including Omicron, providing complete protection against disease and preventing the virus from replicating in mice exposed to it.

"The [immune response](#) generated by the vaccine is also very durable and long-lasting and results to date indicate that Kiwi Vax is stable at refrigerator temperature for several months and at room temperature for at least one month. These are important advantages over current vaccines," says Dr. Connor.

With philanthropic funding, the Malaghan Institute is planning to take Kiwi Vax through to a local phase I safety clinical trial later in 2023 using internationally recognized GMP accredited New Zealand vaccine manufacturer, South Pacific Sera.

Dr. Wiig says preclinically, Kiwi Vax is looking promising as a new potential COVID-19 vaccine booster vaccine, but [human clinical trials](#) are required to confirm efficacy.

"We'd need a significant industry, philanthropic or government partner to progress to later stage clinical trials and regulatory approval. But wherever this lands, what we've set out to achieve here has been achieved. We've proven that New Zealand has the expertise and skills to develop a novel and effective vaccine against a pandemic virus and have built the capability, knowledge and connections to lay the foundations for New Zealand's response to future pandemics."

More information: Isabelle Montgomerie et al, Incorporation of SARS-CoV-2 spike NTD to RBD Protein Vaccine Improves Immunity Against Viral Variants, *iScience* (2023). [DOI: 10.1016/j.isci.2023.106256](#)

Provided by Vaccine Alliance Aotearoa New Zealand

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