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Australia offers new nasal vaccine strategy to improve COVID-19 protection

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Vaccine design could play key role in fight against other diseases



Researchers from the Centenary Institute and the University of Sydney in Australia have developed a new nasal vaccination strategy that induces potent lung immunity and protection against the SARS-CoV-2 coronavirus.

The new vaccine approach has been tested successfully in mice and has the potential to be a powerful tool for enhancing protection against COVID-19 infection and minimising ongoing viral spread.

Made up of the SARS-CoV-2 spike protein and an adjuvant called Pam2Cys (a molecule that helps stimulate a stronger immune response in the body), that was developed by Professor Richard Payne NHMRC Investigator in the University of Sydney's Faculty of Science, the new vaccine was delivered via simply breathing in through the nose. It prompted substantial levels of neutralising antibodies and increased T-cell responses in the lungs and airways of the mice that were tested.

In the mice study, the new vaccine was delivered nasally, making its way through the respiratory tract, adhering to the tissues of the nasal cavity, airways and lungs. Testing showed the generation of high levels of protective antibodies in the airways and increased T-cell responses in the lungs (T-cells help destroy SARS-CoV-2 infected cells). Significantly, none of the vaccinated mice became infected with COVID-19.

"Our vaccination findings have shown exciting potential in pre-clinical studies, improving protection against SARS-CoV-2 infection. The approach developed here could help break the COVID-19 infection cycle and will likely influence future coronavirus vaccine related studies," said Professor Emeritus Warwick Britton AO, Head of the Centenary Institute's Tuberculosis Research Programme.