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NUS medical school developing vaccine with Monash University

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Researchers from the National University of Singapore (NUS) and Australia's Monash University are developing a Covid-19 vaccine that could be ready for clinical trials by the end of next year.

The vaccine, modified from a cancer drug, has undergone animal studies, and researchers are hoping to conduct clinical trials in Singapore and Australia.

Called Clec9A-RBD, it is the third coronavirus vaccine that Singapore is involved in developing.

Known as a fusion protein vac-

cine, it is made by combining an antibody that targets parts of the immune system with an antigen, which induces an immune response to protect against a chosen pathogen.

Scientists can therefore rely on the same antibody to fight different diseases by simply switching the antigen attached to it, said Associate Professor Mireille Lahoud from the Monash University Biomedicine Discovery Institute.

She told The Straits Times yesterday the antibody in Clec9A-RBD had previously been used to create vaccines to fight a variety of diseases such as cancer and influenza.

When the pandemic struck in February, she and two other researchers decided to use it to make a vaccine that could fight Covid-19.

The vaccine targets a specific part of the immune system known as dendritic cells, which "sample" parts of the environment around them and flag dangers to the rest of the immune system. Prof Lahoud said: "If you want to deliver a vaccine... they're the cells you want to target."

The researchers developed a protein that binds to a receptor on these cells, teaching the immune system to fight off Sars-CoV-2, the virus that causes Covid-19.

Three main things set this vac-

cine apart from others in the global race, said the researchers.

First, it is "very good" at stimulating the weak immune systems of the elderly, said Associate Professor Sylvie Alonso from the department of microbiology and immunology at the NUS Yong Loo Lin School of Medicine.

Prof Alonso, who co-leads the school's infectious disease translational research programme, explained that this is because the dendritic cells it targets are present in significant quantities in humans throughout their entire lifespan.

This means a vaccine that targets such cells will likely be as effective

on the elderly as it is on the young.

This is supported by animal models the team has run, using mice.

Second, the vaccine requires only a single dose and a small amount of antigen due to its targeted delivery system.

Prof Alonso said: "These are attributes that are essential in a pandemic situation, where you need to produce millions of doses."

She added that one failing of multi-shot vaccines is that people who have been injected with the first dose may feel safe from the virus and not come back for the essential second or third jab.

Finally, due to its nature as a fu-

sion protein vaccine, Clec9A-RBD can potentially be adapted to fight not just Sars-CoV-2, but coronavirus mutations and other new diseases in the future.

Prof Lahoud said: "I'm hoping for a vaccine for Covid-19, but also to develop this so that we are future-proofing. Once we've established this, we'll be able to apply it to whatever (disease) comes next."

The researchers are seeking approval and funding to further their research, and intend to approach the health authorities in both countries in the coming months.

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