Singapore

Singapore scientists discover 5 antibodies that can combat COVID-19, human trials to commence in coming months

The cell extraction process. (Photo: DSO National Laboratories)

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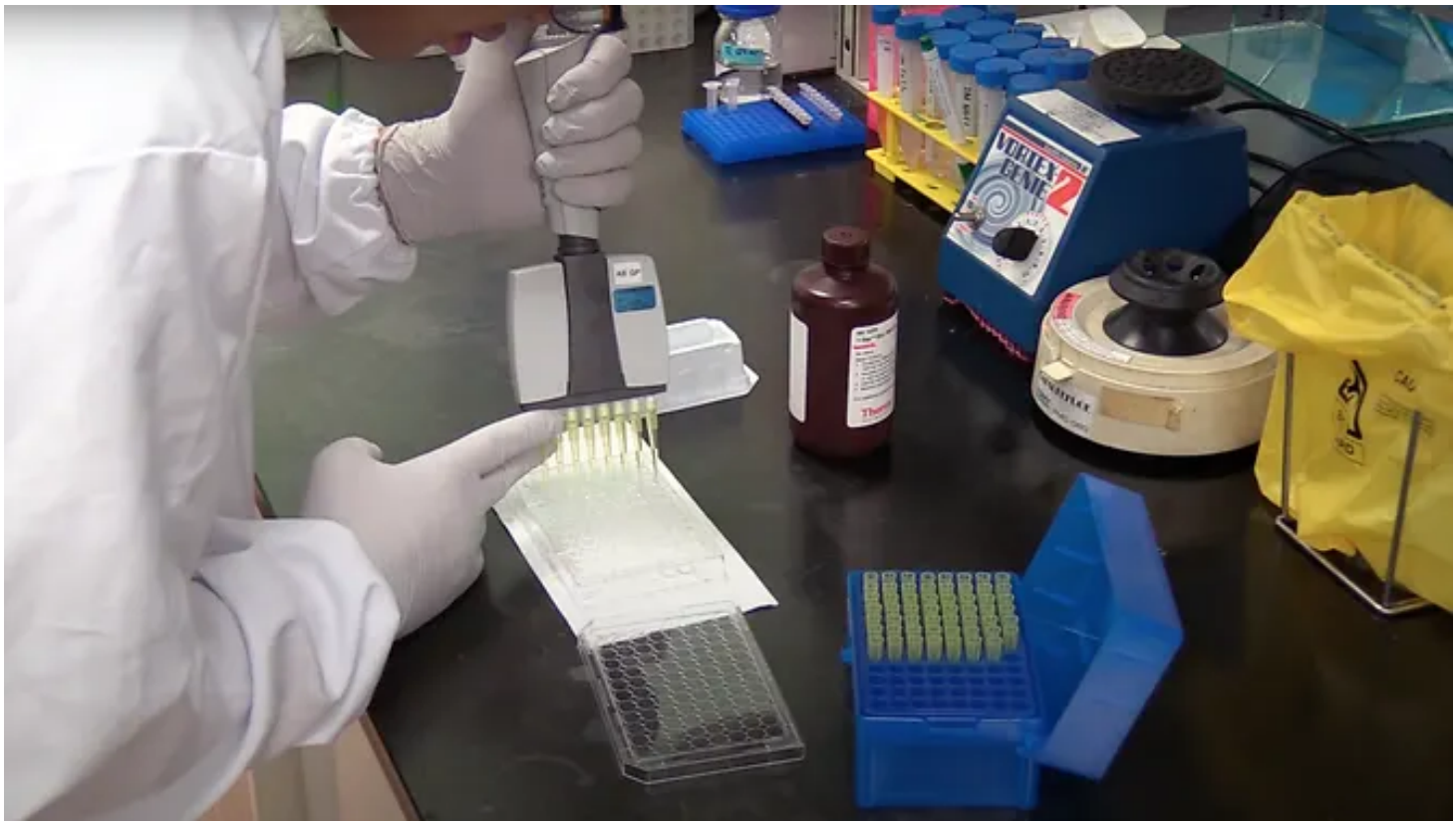
SINGAPORE: A team of Singapore scientists has discovered five antibodies that can block COVID-19 infection and protect against key mutations, Singapore's defence research and development organisation said on Wednesday (Jun 17).

Human trials for the lead antibody, AOD01, will commence in the coming months, pending approval from the Health Sciences Authority, said DSO National Laboratories.

DSO said that its scientists have screened "hundreds of thousands" of B cells - the cells that produce antibodies to target pathogens - from the blood samples of recovered COVID-19 patients since March this year.

The scientists managed to isolate the first two antibodies for testing within a month of receiving the blood samples from the National Centre for Infectious Diseases and Singapore General Hospital. Two months later, it identified another three effective antibodies.



Validation of the antibody. (Photo: DSO National Laboratories)

This was done using a technique that screens B cells simultaneously with live virus, allowing antibodies with effective virus neutralising properties to be quickly identified.

This technique reduces both the time and manpower required, meaning more antibodies can be found and quickly translated into safe and effective treatments for COVID-19 patients in less time.

The tecnique was developed by DSO in collaboration with the National University of Singapore's Yong Loo Lin School of Medicine and Life Sciences Institute over the last five years.

► **READ: Ebola drug remdesivir conditionally approved for COVID-19 treatment in Singapore (/news/singapore/covid-19-treatment-singapore-coronavirus-trials-remdesivir-12699782?cid=h3_referral_inarticlelinks_24082018_cna)**

BLOCKING COVID-19

Results showed that the five antibodies "demonstrate neutralisation" against COVID-19, said DSO.

"They are all potent in blocking infection and effective against key mutations that have emerged in the virus during the pandemic," said DSO.

With the research phase completed, the study is now transiting into the preclinical phase, where the team is preparing the lead antibody for production, said Dr Conrad Chan, principal research scientist and laboratory director (applied molecular technology).

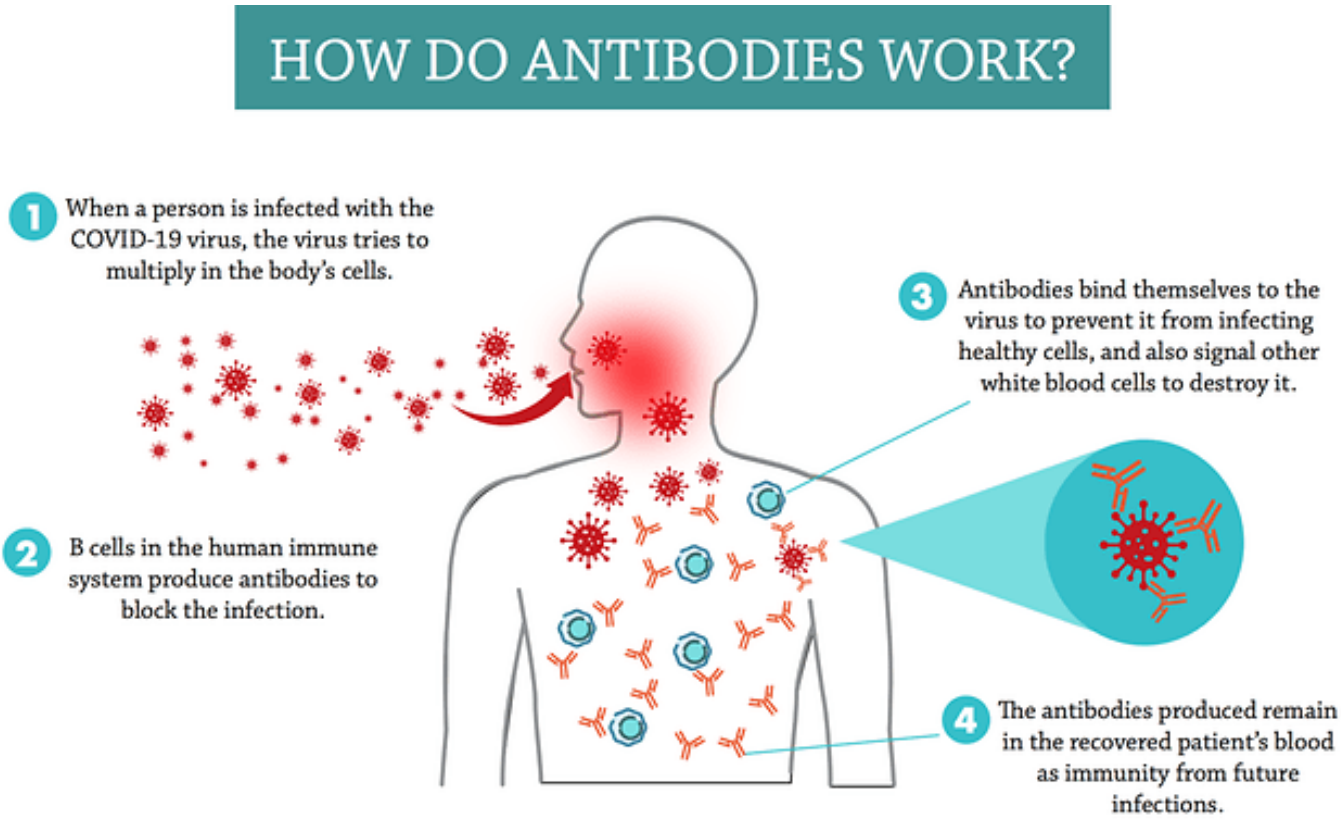
This will allow clinical trials to be conducted, and manufacturing to be scaled up when human trials are successful, he added.

The DSO National Laboratories team working on the development of the COVID-19 antibody. (Photo: DSO National Laboratories)

If the clinical trial "goes well", the antibodies could stop the virus from spreading to the lungs if administered before the illness becomes too severe, he said in response to questions about how the antibodies could help patients.

"When you give the injection of the antibody into a person, the antibody will then circulate throughout the whole of the body ... The virus infects at the upper respiratory tract, which is in your nose and your throat. And it then spreads to the lungs where the serious illness occurs, that's where the real damage occurs," said Dr Chan.

"But by having the antibodies circulating in your body, you can prevent the virus from infecting your lungs," he added.



(Graphic: DSO National Laboratories)

Ideally, the antibodies should be given to patients after they are diagnosed with COVID-19 and before they become seriously ill, Dr Chan said.

Additionally, as antibodies can remain in a person's system for close to a month, it can also be administered to prevent infection, he said.

"By preventing people going into ICU you really prevent the overload of hospital resources that is the fear of all the healthcare administrators around the world," he said.

Responding to questions on why antibodies from recovered COVID-19 patients were used, Dr Chan said this "improves the chances" of the antibody being safe and effective.

"Our approach has been to recover antibodies from people who have gotten better after falling sick from COVID-19, because these antibodies have been in somebody before and they have helped them to defeat the infection."

► READ: Singapore company to start clinical safety trials in humans for potential COVID-19 treatment (/news/singapore/covid-19-singapore-treatment-antibody-coronavirus-tychan-12822570?cid=h3_referral_inarticlelinks_24082018_cna)

RACE FOR TREATMENTS, VACCINE

On Jun 10, Singapore-based biotechnology company Tychan said it would start human trials this week for a treatment that could slow down the progression of COVID-19 in patients, help them recover faster and provide temporary protection against the coronavirus.

The firm has developed TY207, a monoclonal antibody that specifically targets the coronavirus that causes COVID-19, and has received approval from HSA. Monoclonal antibodies can be isolated and manufactured in large quantities to treat diseases.

The potential treatment was developed in partnership with the Ministry of Defence, Ministry of Health, the Economic Development Board and other Government agencies as part of a whole-of-Government effort.

Separately, antiviral drug remdesivir has been granted conditional approval by HSA to be administered to COVID-19 patients in Singapore who are severely ill. This means doctors can use remdesivir to treat adult COVID-19 patients who require supplemental oxygen or require more intensive breathing support, such as the use of ventilators or life support machines.

Other drugs used in clinical trials to treat COVID-19 patients in Singapore have included anti-HIV drugs lopinavir and ritonavir (/news/singapore/wuhan-coronavirus-virus-singapore-hiv-drugs-treat-12391030).

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