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DSO team in S'pore finds 5 antibodies that can combat virus

Timothy Goh

Five antibodies which could potentially neutralise the virus that causes Covid-19 have been discovered by scientists at DSO National Laboratories, Singapore's national defence research and development organisation.

Human trials for the most promising of the five, known as AOD01, will likely commence in the coming months, pending approval from the Health Sciences Authority, DSO said yesterday.

Singapore is stepping up research in this area, with at least three other projects in progress, involving Singapore-based biotechnology company Tychan, the Agency for Science, Technology and Research (A*Star) and the Duke-NUS Medical School.

Since March, the team at DSO has screened hundreds of thousands of antibodies produced by cells of the human immune system in blood samples taken from recovered Covid-19 patients.

Dr Conrad Chan, principal research scientist and laboratory director (applied molecular technology) at DSO, said: "Administration of an antibody obtained from a recovered individual transfers that person's protection to the recipient, enabling any patient to better fight the infection and recover faster."

He added that as antibodies remain in the system for close to a month, they can also be used to prevent infection.

The first two neutralising antibodies were discovered on March 19 and 30 using a screening technique that had been developed in collaboration with the National University of Singapore's (NUS) Life Sciences Institute and the NUS Yong Loo Lin School of Medicine over the last five years.

The technique, which involves the use of a live virus, is part of DSO's "Antibodies on Demand" strategy to counter novel infectious disease outbreaks. It allows for quick identification of neutralising antibodies and saves more time and manpower compared with conventional methods.

DSO will also be bringing together a Singapore-based consortium comprising government agencies, research institutes and biomedical companies to quickly advance the development of the antibodies.

Dr Brendon Hanson, principal research scientist and project lead, said: "We are trying to tap all the expertise that has been developed in Singapore over the last few years so we can have a completely in-Singapore capability to bring an antibody from the research phase into the clinical phase, to be able to treat Covid-19 infection (here)."

Professor Ooi Eng Eong, deputy director of Duke-NUS Medical School's emerging infectious diseases programme, said he felt therapeutic antibodies are a useful tool to combat the coronavirus. "That's how our body fights a virus, it produces antibodies, and here what we're doing is producing it in a lab and giving it to you," he said.

But he added that more study of such treatments was needed.

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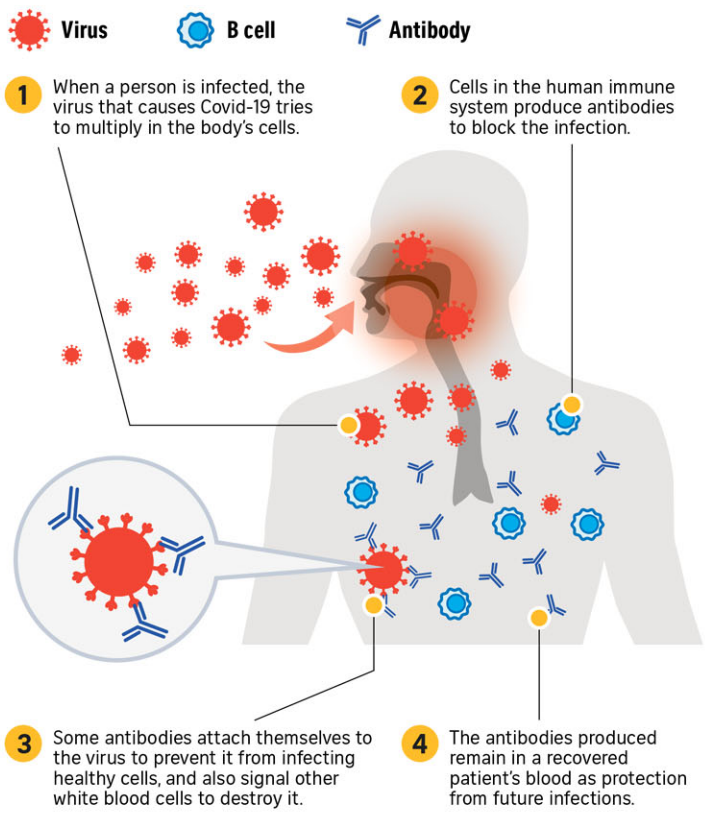
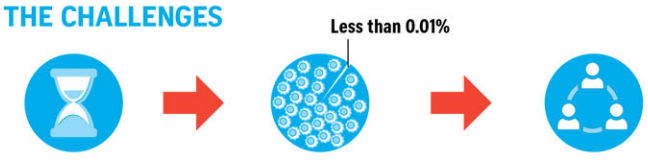
Antibodies for Covid-19 treatment

As Singapore steps up research in this area, DSO National Laboratories, the Republic's national defence research and development organisation, explains how antibodies can help in the war against Covid-19.



THE CHALLENGES



Screening and isolating potent antibodies for therapy is both time-consuming and manpower-intensive.

Less than 0.01 per cent of the approximately 100,000 cells in each blood sample produces the antibodies capable of effectively neutralising the virus.

With the use of a special screening technique, DSO has managed to reduce the time and manpower needed to get the work done.

A TIMELINE OF THE DSO STUDY

March
Hundreds of thousands of cells are screened and within a month, two are isolated that can safely and efficiently combat the virus that causes Covid-19 and its key mutations.

May
Three more effective antibodies are discovered.

June
Further testing is conducted on the lead antibody, AOD01, for clinical trials.

Current
Pending approval by the Health Sciences Authority, clinical trials for AOD01 will begin in the coming months.

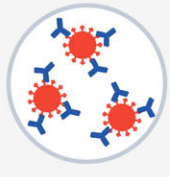
HOW ANTIBODIES ARE USED FOR TREATMENT

A blood sample is taken from a recovered patient and the most effective antibodies against Covid-19 are isolated.

Cells that can be genetically engineered to produce large quantities of these antibodies are cultured.

The antibodies are purified and injected into an infected patient for antibody therapy.

In an infected patient, the antibodies should speed up recovery and block new infections.



A single injection of antibodies will last about a month in the body.

Antibody drugs are already being used to treat cancer and autoimmune diseases.

Source: DSO NATIONAL LABORATORIES STRAITS TIMES GRAPHICS