

Biotech firm to test freeze-dried version of Covid-19 vaccine

US-based biotech company Arcurus Therapeutics, which is developing a Covid-19 vaccine with the Duke-NUS Medical School here, is looking at a lyophilised or freeze-dried version of its mRNA vaccine to get around cold chain challenges.

It will be testing it in upcoming trials. If successful, the product will remove the need to have special ultra-cold freezers, which are costly and not common and make it challenging to deploy the vaccine. The phase 1/2 trials for the candidate vaccine are being conducted here.

Meanwhile, the National Centre for Infectious Diseases will start enrolling Covid-19 patients for a large global trial to test monoclonal antibody treatments for the disease.

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Firm behind S'pore's potential vaccine to test freeze-dried version

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Singapore's potential Covid-19 vaccine could well be one which can be manufactured, shipped and stored with ease, as the company behind it is working on a version which does not need ultra-cold conditions for it to survive.

Arcturus Therapeutics, a US-based biotechnology company developing a Covid-19 vaccine with the Duke-NUS Medical School here, is looking at a lyophilised or freeze-dried version of its mRNA vaccine that could work well at room temperature, unlike other similar vaccines.

Its president and chief executive Joseph Payne said: "We intend to investigate a lyophilised vaccine product in our larger clinical trials.

"By having a lyophilised vaccine product and removing the water (in the product), it means that shelf life could be improved greatly and handling is much less complicated (as) it would not require minus 60- to 80-centigrade freezers or dry ice handling."

In a recent Zoom interview, Mr Payne told *The Straits Times* that they are evaluating the stability of their vaccine at various temperatures, including at minus 20 deg C, 4 to 8 deg C, and room temperature.

Having a successful lyophilised product, which is a powdered version that needs to be reconstituted on site, removes the need for special ultra-cold freezers, which are costly and not common, he said.

The cold chain challenges of deploying certain Covid-19 vaccines have been in the news recently as the spotlight is increasingly placed on the enormous task of manufacturing and deploying a vaccine.

With developers racing ahead with their trials, it is looking more likely that a Covid-19 vaccine will emerge soon.

World Health Organisation

(WHO) chief Tedros Adhanom Ghebreyesus said this week there is hope that there will be a Covid-19 vaccine by the end of this year.

Forty-two Covid-19 vaccine candidates are currently in clinical trials, of which 10 are in large-scale, phase three trials, according to the WHO.

Another 151 vaccine candidates are in the pre-clinical stage, it said.

Even as vaccine developers move at an unprecedented speed to come up with a vaccine, many challenges remain, including, in Arcturus' case, finding suitable trial sites where the virus is spreading fast.

Arcturus' vaccine candidate is a self-replicating mRNA vaccine.

Known as the Lunar-Cov19, it is in phase one/two trials, which are being conducted in Singapore.

The larger trials can start once they have locked in the dose level and dose regimen, said Mr Payne, adding that the results of phase one/two trials will be out in the current quarter. He said the larger phase two/three trials will likely involve multiple countries in areas where there is a high prevalence of Covid-19.

"If we're conducting the study in densely populated areas where there are a lot of Covid-19 (cases), then we can prove that it works much more quickly," Mr Payne said.

"We want to make sure that a portion of our study is done in an area that has an internationally respected regulatory agency."

International governance in recognising which vaccines are acceptable is clearly needed, said Professor Teo Yik Ying, dean of the National University of Singapore's Saw Swee Hock School of Public Health.

It is precisely why the Covax Facility is important, as it sets a global standard for Covid-19 vaccines at the very least, he said.

Led by the WHO, public-private partnership Gavi vaccine alliance and the Coalition for Epidemic Preparedness Innovations, Covax is

aimed at working with vaccine manufacturers to provide global, equitable access to Covid-19 vaccines.

It currently has nine Covid-19 vaccine candidates, with another nine under evaluation.

"They have already announced the minimum standards for a Covid-19 vaccine, which is a minimum of 70 per cent efficacy in a large, phase three clinical trial, if it is meant to be distributed widely for the purpose of preventing an outbreak," said Prof Teo.

A lower efficacy of 50 per cent is tolerated if the vaccine is intended to be used for control when an outbreak has already occurred, he said.

At a recent European conference, experts again reiterated that a vaccine is not the be-all and end-all. London School of Hygiene and Tropical Medicine's Professor David Heymann stressed the need to fight on.

"I think what we need to do today is learn to live with the virus using the tools we have, including the diagnostic tests..." he said.

"We just don't know a lot about what will happen with a vaccine because we don't understand the immune response. The efforts to understand it in animal models are quite unprecedented, as are the efforts in humans."

It remains unclear if a Covid-19 vaccine will provide long-lasting or short-lived protection, what type of booster jabs might be required or if the vaccine can prevent reinfection, Prof Heymann said.

Prof Teo said while some early findings from phase three trials could be announced over the next few weeks, the conclusive results are likely to be determined only in the early part of next year.

Even then, there is still the mass production and distribution issue.

Prof Teo said he expects to receive a viable vaccine only some time in the latter half of next year.

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