

Media Release

Tuesday, 27 March 2018

World-first technology developed by Australian biotech company set to revolutionize global vaccine industry

Vaccines for numerous diseases and conditions are set to be revolutionized by an emerging Australian biotech company.

Sementis has worked to substantially improve upon the well tested and proven smallpox vaccine to improve its safety profile and increase its immunogenicity.

This altered vaccine - named the Sementis Copenhagen Vector (SCV) - is used as a vaccine delivery vehicle for the delivery of antigens from infectious diseases to create immunity upon vaccination.

Sementis – together with researchers from QIMR Berghofer Medical Research Institute in Brisbane and the University of South Australia in Adelaide - is the first company in the world to create a single vectored vaccine that is designed to produce immunity to both the Zika virus and chikungunya infections with a single vaccination.

The results from this world-leading collaboration were published overnight in the prestigious journal, *Nature Communications*. The link is here - <https://www.nature.com/articles/s41467-018-03662-6>

Sementis has now been invited to utilize the suite of preclinical services from the renowned National Institute of Allergy and Infectious Diseases (NIAID), part of the US Government's National Institutes of Health, to evaluate the SCV vaccine in a non-human primate vaccination study.

This will help prove the effectiveness of the vaccine in a species closely related to humans. This study will be fully funded by NIAID.

“The NIAID is a part of one of the largest and most reputable and prestigious public health institutes (National Institute of Health in the USA) in the world and so we are very grateful for this opportunity as it will give further credibility to our SCV platform technology,” Sementis CEO and inventor of the technology, Dr Paul Howley, said today.

“It was logical to create a single vaccine for both diseases. Zika virus and chikungunya are transmitted by the same mosquito and co-circulate in the Americas, Africa and Asia where a single mosquito bite can transmit both viruses at the same time,” he said.

Sementis Chairman, Maurice O’Shannassy, said: “Combination vaccines have traditionally required multiple batch production runs and careful mixing in order to produce a vaccine for multiple diseases. We expect there to be numerous diseases and conditions that can be combined into one vaccine delivery vehicle using this technology.”



“This SCV vaccine is produced using Chinese Hamster Ovary (CHO) cells, as are all our SCV-based vaccines, which are routinely used for large-scale manufacturing of biopharmaceuticals,” he said.

“Being able to manufacture a vectored vaccine using CHO cells is a world first. We believe that the production of a viral vectored vaccine in a CHO cell substrate is a revolution in terms of the improved economics of vaccine production and providing vaccines on a global scale.

“Our ground-breaking SCV system offers a number of advantages in the event of an outbreak, including rapid manufacture scale-up.”

Zika virus is an emerging virus that is transmitted by mosquitos where infection often causes no or mild initial symptoms. However, in some adults it can lead to Guillain-Barre syndrome, a condition in which the immune system attacks the nerves.

The most devastating manifestation of Zika virus infection is the array of serious congenital abnormalities in the foetuses and infants of women infected while pregnant.

The virus infection can also persist in the male reproductive tract and infected men can transmit virus to sexual partners during this period of persistent infection.

This dramatically increases the risk that an infected male inadvertently transmits the virus to a pregnant partner. Currently there are no antiviral drugs or vaccines for the virus.

Chikungunya is a viral infection caused by the chikungunya virus that is also transmitted by mosquitos; the same mosquito species that can transmit Zika virus.

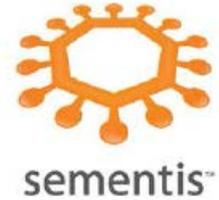
In some cases, chikungunya can be asymptomatic – persons do not exhibit symptoms, but those with symptoms usually suffer from sudden fever and severe muscle and joint pain. In a few cases, chronic joint pain that may last for several weeks or months and may be accompanied by eye, gastrointestinal, neurological, and heart complications.

Chikungunya is rarely fatal and treatment includes supportive care of symptoms as there is no antiviral treatment or a vaccine available. Chikungunya virus is often misdiagnosed for Zika virus infection or dengue fever.

QIMR Berghofer Inflammation Biology group leader, Professor Andreas Suhrbier, said: "Pre-clinical proof-of-concept studies show that Sementis' new SCV vaccine can afford protection against chikungunya infection and prevent persistent virus-induced arthritic complications.

“In addition, these studies have shown that the vaccine can afford protection against Zika virus infection and, very importantly, prevent the transmission of the virus during pregnancy to foetus and persistent infection of the testis.”

University of South Australia Professor John Hayball said: "These findings confirm the versatility of SCV and its effectiveness as a delivery vehicle for a vaccine protecting against multiple infectious diseases."



"The results are very exciting and set the stage for Sementis to continue exploring the capacity and capability of the SCV in creating a single vaccine delivery vehicle for multi-disease vaccines that only require one manufacturing batch production run," he said.

Advance Queensland research fellow, Dr. Natalie Prow, who received a grant from the Queensland Government to test the vaccine at QIMR Berghofer, said it was her hope that human clinical trials would be the next step.

"The SCV vaccine would be a welcome medical counter measure in countries where both chikungunya and Zika virus coinfection exist," she said.

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