Clinical trial aims to find strep A's Achilles heel with potential vaccine to prevent rheumatic heart disease

November 10 2022, by Emma O'Connor

Credit: Pixabay/CC0 Public Domain

A team of international scientists from Griffith University and the University of Alberta are about to start human clinical trials for a strep A

vaccine they hope will induce long-lasting immunity against the deadly pathogen which kills more than 500,000 people each year.

Griffith University researchers identified two small molecules (epitopes) found on every Streptococcus A strain and combined them into a vaccine candidate designed to enhance the body's immune response against even the most virulent strain.

Lead researcher Professor Michael Good AO from Griffith's Institute for Glycomics said previous Streptococcal A vaccine research had been slowed by the enormous diversity of the pathogen, but that his vaccine design is based on presenting key epitopes to the immune system that represent its Achilles heel.

"This gives us a novel strategy to finally make a successful vaccine to protect against multiple strep A strains," he said. "There is currently no vaccine available and natural immunity to strep A takes years to develop. This is because there are multiple strains and it is a highly virulent organism that subverts immunity."

Distinguished Professor Lorne Tyrrell OC and Nobel Laureate Sir Michael Houghton from the Li Ka Shing Applied Virology Institute at the University of Alberta, who are sponsoring the clinical testing, said streptococcal disease was a major cause of global morbidity and that amongst First Nations people in Canada, invasive streptococcal disease was a significant cause of premature mortality.

"Our Li Ka Shing Applied Virology Institute is dedicated to preventing major viral and bacterial infections where there is serious unmet medical need,"' Sir Michael said.

"Professor Michael Good holds an adjunct position at the University of Alberta and we are delighted to be helping him and our colleagues at

Griffith University in working to curb this dangerous global epidemic which afflicts many Canadians, including indigenous peoples."

Dr. Manisha Pandey from the Institute for Glycomics said repeated infections can also cause auto-immune complications such as rheumatic fever and rheumatic heart disease.

"In Australia, Aboriginal and Torres Strait Islander peoples suffer the highest rate of rheumatic heart disease in the world."

The trials will take place at the University of Alberta, Canada, within the NACTRC clinical trials center led by Dr. Lawrence Richter and Dr. Michael Hawkes, and are due to commence on 21 November.

If the trial is successful, the vaccine could be available for children and people at high risk of disease within five years.

Institute for Glycomics Director Professor Mark von Itzstein AO said he was delighted the Institute for Glycomics has developed this important vaccine candidate from discovery to human clinical trials, with the potential to save many lives.

"It's a great example of the Institute's translational output and what we hope will be the world's first vaccine to market for prevention of diseases caused by strep infection."

Provided by Griffith University