

New research targets West Nile virus and dengue fever

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Research conducted at The University of Queensland could contribute to the development of a vaccine and cure for West Nile virus and Dengue fever.

Led by Associate Professor Alexander Khromykh, a team of researchers from UQ's School of Molecular and Microbial Sciences identified a novel characteristic of the virus family to which these diseases belong.

The team found all flaviviruses produced a small molecule which, among other functions, controlled the host's response to viral infection.

This molecule, called a subgenomic noncoding ribonucleic acid (sfRNA), is a part of the virus genome.

"To develop new and effective antiviral strategies, we have to know as much as possible about the virus, or virus family, that we are fighting," Dr Khromykh said.

"As sfRNA is produced by all flaviviruses we tested so far, targeting it with an antiviral therapy may be effective for the whole range of flaviviruses.

"By using reverse genetic engineering we were able to generate viruses that do not produce this sfRNA and showed that these engineered viruses are no longer able to kill their hosts or elicit disease symptoms.

"These engineered viruses offer great potential as vaccine candidates as they are expected to elicit an antiviral immune response similar to the normal virus infection without causing a disease."

Dr Khromykh said by studying mice infected with these engineered West Nile viruses, the team learned more about how the body attempted to combat a flavivirus infection.

The part of the virus the infected cells in the body are unsuccessful in destroying forms the sfRNA, which helps the virus to kill cells and cause potentially deadly diseases, he said.

"We identified sfRNA as a potential antiviral target for the large group of medically important viruses," Dr Khromykh said.

"Moreover, the knowledge obtained from our studies with West Nile virus should be readily applicable for designing anti-viral drugs and engineering similar vaccine candidates for other medically important flaviviruses."

Source: Research Australia

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