

Scientists close in on first dengue treatment

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University of Queensland scientists who have made a finding that may allow them to repurpose existing dengue fever drugs: (L to R): Naphak Modhiran, Dr. Dan Watterson, Associate Professor Kate Stacey, Professor Paul Young. Credit: The University of Queensland

Clinical trials for a dengue fever treatment could start within a year, following a discovery by University of Queensland scientists.

UQ's School of Chemistry and Molecular Biosciences Head Professor Paul Young said the researchers had identified similarities in how the body reacted to dengue virus and bacterial infections, in a finding that would allow them to re-purpose existing drugs.

"We have discovered that the dengue virus NS1 protein acts as a toxin in the body, in a similar manner to the way [bacterial cell wall](#) products lead to septic shock in bacterial infections," he said.

"For the past 20 to 30 years, researchers and pharmaceutical companies have been developing drug candidates to inhibit the body's damaging responses to these bacterial infections.

"So drugs are already available that have gone through phase three clinical trials.

Professor Young said mosquito-borne [dengue virus](#) was an increasing problem in tropical and sub-tropical areas, with more than 2.5 billion people in more than 100 countries at risk of infection.

Dengue virus is estimated to infect up to 400 million people globally each year. The World Health Organisation ranks it as the most important mosquito-borne viral disease in the world.

"Given increased international travel and the prospect of climate change extending the range of the [dengue mosquito](#), more people will be at risk," Professor Young said.

Dengue typically causes a debilitating fever but can progress to potentially fatal dengue hemorrhagic fever and [dengue shock syndrome](#).

Up to 500,000 cases of [dengue hemorrhagic fever](#) are diagnosed each year, with as many as 25,000 deaths.

"Despite this significant global health burden, no vaccine or drug has yet been licensed," Professor Young said.

PhD student Naphak Modhiran, who came from Thailand to work on the project, said last year Thailand suffered its worst [dengue](#) epidemic in more than 20 years.

"There were more than 200,000 cases and many deaths," she said.

"I hope our discoveries in the lab will translate to the patient bedside and eventually help those who suffer from [dengue infection](#) around the world."

The UQ research group's findings and the availability of drugs already developed for bacterial infections mean that clinical testing could begin in as little as one to two years.

Members of the UQ research team are Professor Paul Young, PhD student Naphak Modhiran, Associate Professor Kate Stacey and Dr Dan Watterson.

The research, conducted in UQ's School of Chemistry and Molecular Biosciences and the Australian Infectious Disease Research Centre, is published in *Science Translational Medicine*.

The work has been funded by the National Health and Medical Research Council.

More information: "Dengue virus NS1 protein activates cells via Toll-like receptor 4 and disrupts endothelial cell monolayer integrity,"

stm.sciencemag.org/lookup/doi/.../scitranslmed.aaa3863

"Dengue virus NS1 triggers endothelial permeability and vascular leak

that is prevented by NS1 vaccination," [stm.sciencemag.org/lookup/doi/... scitranslmed.aaa3787](https://doi.org/10.1186/scitranslmed.aaa3787)

Provided by University of Queensland

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