

New discovery on how the body fights dengue fever

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Worldwide, dengue fever strikes roughly 50 million people every year and takes the lives of thousands, but specific therapies or a vaccine for this mosquito-borne illness remain unavailable. A report coming out in the online journal *mBio*® on December 13 describes a new discovery about how the body fights the dengue virus, a finding that could explain differences in the ability to fight off the virus and help in developing a drug to boost this response.

Dengue is relatively unknown here in the U.S., but according to the World Health Organization the global incidence of dengue infection has been rising alarmingly in the past decades. Today, 2.5 billion people are at risk from dengue fever and from dengue hemorrhagic fever, a lethal complication of infection. Despite the high infection rates, there are currently no specific treatments for [dengue fever](#) and no vaccine to prevent infection with the [dengue virus](#). Many scientists who study the disease have been searching for ways to boost the human immune response to dengue so that it can't gain a foothold in the body.

Researchers from Washington University, Walter Reed Army Institute of Research and the University of Copenhagen, Denmark, report a new finding that a part of the immune system called mannose-binding lectin (MBL) is involved in targeting dengue viruses for destruction. MBL recognizes sugar molecules present on the outsides of many different kinds of viruses and bacteria. When it finds these sugars, MBL activates the complement system, which targets foreign materials in the body for destruction in any of a number of cruel ways. Scientists have known that

the complement system takes a hit during dengue infection, but until now no one knew that it was also involved in getting rid of dengue viruses.

"Before, people thought the complement system was involved primarily in pathogenesis," says Sujan Shresta, an Associate Professor at the La Jolla Institute for Allergy and Immunology, who reviewed the paper and was not involved in the work. "This paper is the first to look at the role of the complement system in the context of protection" from the dengue virus, says Shresta.

This is an important discovery in terms of human health, continues Shresta, because different people naturally make different amounts of MBL. Some people have high levels of MBL, some people have low levels, a fact that may help explain why some individuals are able to fight off the virus while others are not.

The authors showed that blood samples with high levels of MBL neutralized dengue more efficiently than samples with lower levels of MBL. This finding suggests that people with high MBL levels in their blood could well be better at fighting dengue infection.

This is a clue that could help scientists create therapies for the disease. "You could develop antivirals that work through a similar mechanism," to deactivate [dengue](#) viruses, says Shresta. Vaccines could also be designed to activate this pathway, she says, helping boost the normal functions of the immune system to fight off infection.

Provided by American Society for Microbiology

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