

Researchers identify new cell that attacks dengue virus

May 16 2011

Mast cells, which can help the body respond to bacteria and pathogens, also apparently sound the alarm around viruses delivered by a mosquito bite, according to researchers at Duke-NUS Graduate Medical School in Singapore.

"It appears the mast cells are activated and call [immune system cells](#) to the skin where they clear infection, which limits the spread of infection in the host," said lead researcher Ashley St. John, a Research Fellow with Duke-NUS in the Program in Emerging Infectious Diseases, and the Duke Department of Pathology in Durham, N.C.

Studying dengue virus in mice, the research team found that mast cells can sense and recognize viruses, and in turn release signaling chemicals to create an immune response.

The scientists chose to study dengue virus, which is common in Singapore, because mosquitos inject the virus through the skin, and skin is rich in mast cells.

They found that mice lacking mast cells had more of the virus in their lymph nodes and increased infection after measured injection with a small dose of dengue virus, compared to mice with normal levels of mast cells. The mast cells produce chemokines, which in turn help to bring some special [killer cells](#) into the infected skin to fight and contain the virus.

"It was an important discovery for the field to learn that mast cells could be activated by pathogens like bacteria or parasites," St. John said. "We were excited to learn that mast cells also respond to and promote the clearance of a viral infection."

"The finding is important because to date there are no vaccines or effective therapies for dengue fever," said senior author Soman Abraham, Ph.D., Professor of Pathology and mast-cell expert, also in the Program In [Emerging Infectious Diseases](#).

St. John said that the finding opens new paths to explore. Because mast cells are involved in airway reactions, as during an [asthma attack](#), this new finding might also help scientists study viral infection in the lungs, airways and sinuses.

She noted that other mosquito-borne viruses could also be studied in terms of mast-cell response, like the West Nile virus.

"Now that we know mast cells can recognize viruses, we can better understand how that infection process begins," Abraham said. "Knowing the important role of mast cells in viral infections could help find ways to prevent these infections, perhaps in the form of vaccines." Because [mast cells](#) can be deliberately activated and also shut down with small molecules, different approaches can be studied, he said.

Provided by Duke University Medical Center

Citation: Researchers identify new cell that attacks dengue virus (2011, May 16) retrieved 19 April 2024 from <https://medicalxpress.com/news/2011-05-cell-dengue-virus.html>

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