

Researchers discover how west nile virus survives in mosquitoes

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(PhysOrg.com) -- West Nile virus tricks mosquitoes into producing a particular protein complex that allows it to survive and be transmitted, Yale researchers report in the Sept. 3 issue of the journal *Cell*.

This molecular survival mechanism helps explain how [West Nile virus](#) got a foothold for the first time in North America nearly a decade ago, note the researchers. And as temperatures rise in the hemisphere, this mechanism may help public health officials in traditionally temperate climates identify emerging threats from tropical diseases, they add.

West Nile needs to survive in both [mosquitoes](#) and in the host organisms the insects feed upon, such as birds and humans. How the [virus](#) accomplishes this has been unclear. Once confined exclusively to the

Old World, West Nile was first reported in North America in Queens, NY in 1999. Since then it has established itself in both mosquitoes and host populations across the country, causing sporadic outbreaks of flu-like illnesses, encephalitis and occasional deaths.

The Yale team was led by Erol Fikrig, the Waldemar Von Zedtwitz Professor of Medicine, professor of epidemiology and [microbial pathogenesis](#) and senior author of the study. The researchers found that the virus requires a specific molecular chain of events in order to survive in mosquitoes after they have fed on infected hosts. The presence of the virus induces expression of a large amount of a C-type lectin protein in the mosquito. The virus then hitchhikes on this protein and teams with yet another protein to gain entry into the cell where it can reproduce.

Fikrig, an investigator for the Howard Hughes Medical Institute, is studying whether this same mechanism plays a role in the life cycle of other mosquito-borne diseases such as malaria and dengue fever. In theory, interrupting this mechanism could prevent mosquitoes from acquiring and passing on diseases.

Fikrig also notes that it may be possible to predict the spread of emerging [infectious diseases](#) into traditionally more temperate climates by understanding which mosquito populations produce the proteins complexes. Public health officials could be particularly vigilant in regions with large numbers of mosquitoes capable of harboring the viruses, he notes.

Provided by Yale University

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