

Gene interplay helps to explain dengue's spread

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Complex genetic interaction between the mosquito and the virus that causes dengue fever lie at the spread of this dangerous disease, a study by French and Thai scientists said Thursday.

The mosquito-borne disease has traditionally been considered a problem of the tropics, but globalisation, [climate change](#) and jet travel are helping it move into more temperate zones, experts say. There is no vaccine or cure.

In a study published in the open-access journal *PLoS Genetics*, a team found that some mosquitoes of the main vector species, *Aedes aegypti*, are able to hand on the virus after sucking blood from an infected human, but others do not.

The answer lies in a genetic pairing between insect and virus, according to the paper France's Pasteur Institute and the Armed Forces Research Institute of Medical Sciences in Bangkok.

To be able to infect humans, the mosquito first has to become successfully colonised by the virus.

After the mosquito feeds on an infected individual, the virus becomes established in the insect's mid-gut cells, then disseminates throughout the rest of body.

The mosquito becomes infectious only once the virus reaches the salivary glands and is released into its saliva.

But the infection is established only when the right strain of mosquito meets the right strain of dengue, according to the paper, which tested wild insects on the four viral types.

A mosquito may be resistant to one type of virus but vulnerable to another.

The finding has implications for plans to control dengue by releasing genetically engineered virus-

resistant [mosquitoes](#), the paper says.

"Such strategies may need to knock down a larger number of genes than previously thought to confer complete resistance," it cautions.

The World Health Organisation estimates that there may be 50 million to 100 million dengue infections worldwide every year, and 2.5 billion people are at risk from the disease.

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