Research group identifies potential pathway for blocking transmission of Chikungunya virus

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(Medical Xpress)—Researchers have taken the first step towards preventing transmission of the mosquito-borne tropical chikungunya virus, which is in danger of invading Central and South America and the south-eastern states of the USA.

The heightened risk in countries whose inhabitants have no immunity to

the illness has led to calls for further research into the virus for which, to date, there is no treatment.

Researchers at the Medical Research Council (MRC) - University of Glasgow Centre for Virus Research, in collaboration with colleagues at the Institut Pasteur, France, have identified a pathway in the mosquito that could be targeted to prevent transmission.

"It's a first step but an important step," said Dr Alain Kohl, "because now we have clearly identified an antiviral pathway in the mosquito."

The researchers have identified the RNA interference (RNAi) pathway as having the greatest potential for future anti-viral interventions.

Unlike malaria, which is a disease transmitted by parasites carried by mosquitoes (albeit a different species– the Anopheles mosquito), chikungunya is a virus carried by the Aedes aegypti and Aedes albopictus mosquito species. They are well-established in parts of Central Africa, India and South-east Asia. Aedes albopictus is also now found in parts of Europe and around the Mediterranean,

Once a pathway is identified, scientists will look for ways of breaking the transmission chain – either by weakening or strengthening the immunity of the mosquito – possibly through genetic modification procedures.

"First of all you have to know what you to have to target. Once you develop this knowledge, you can either try to make the mosquitoes immune-deficient or strengthen their immunity, so that when such a virus comes along, they would become less or extremely resistant. We have to test both to see if we can break the transmission chain one way or another," said Dr Kohl.

The chikungunya virus is not usually fatal but can very debilitating and painful; survivors can be severely affected by long-term problems, including arthritis. The name "chikungunya" derives from a word in the Kimakonde language, meaning "to become contorted" and describes the stooped appearance of sufferers with joint pain (arthralgia).

An outbreak on the island of La Reunion, in the Indian Ocean, in 2006 struck more than 100,000 people. In 2007, a localised transmission was reported in north-eastern Italy and there have been reports of 275 imported cases of the virus in France, brought in by people who have visited French territories overseas.

On August 22 this year, the US CDC reported almost 600,000 suspected cases and 6,455 confirmed cases in the Americas following introduction into the Caribbean, U.S. health authorities are becoming increasingly concerned following reports of locally-acquired cases for the first time in the state of Florida.

The "perfect storm" for spreading chikungunya exists when a person returns infected from a country where the virus is endemic and is then bitten by one of the mosquito species capable of transmitting it. As the specific mosquitoes required for transmission of chikungunya are not found in the UK, there is very little risk of it appearing in this country. Virologists, however, warn that mosquito species can be transported in exports such as bamboo, via the plant trade, on ships and planes, and in vehicles' tyres which may contain standing water.

More information: "Characterization of Aedes aegypti Innate-Immune Pathways that Limit Chikungunya Virus Replication." Melanie McFarlane, Camilo Arias-Goeta,, Estelle Martin, Zoe O'Hara, Aleksei Lulla, Laurence Mousson, Stephanie M. Rainey, Suzana Misbah, Esther Schnettler, Claire L. Donald, Andres Merits, Alain Kohl, Anna-Bella Failloux. *PLOS Neglected Tropical Diseases* DOI:

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