Researchers create new experimental vaccine against chikungunya virus

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Researchers have developed a new candidate vaccine to protect against chikungunya virus, a mosquito-borne pathogen that produces an intensely painful and often chronic arthritic disease that has stricken millions of people in India, Southeast Asia and Africa.

A single dose of the experimental vaccine protected lab mice from infection with the virus, according to a paper published online in the journal PLoS Pathogens by researchers from the University of Texas Medical Branch at Galveston, Inviragen, Inc., of Ft. Collins, Colorado, the University of Wisconsin, the Centers for Disease Control and Prevention and the University of Alabama.

"Currently, we have no approved treatment or vaccine for chikungunya, and there's a real need for an effective vaccine to protect against this debilitating and economically devastating infection," said Scott Weaver, director of UTMB's Institute for Human Infections and Immunity, scientific director of the Galveston National Laboratory and senior author of the paper. "Everything we've seen so far suggests this vaccine candidate could fill that need."

The experimental vaccine is a "recombinant live-attenuated vaccine" created by genetically modifying the chikungunya virus using techniques developed with the initial support from the Western Regional Center of Excellence in Biodefense and Emerging Infectious Diseases, headquartered at UTMB. The resulting vaccine strain differs from wild-type chikungunya virus in two ways: it doesn't cause disease, and it's

incapable of infecting mosquitoes; the latter trait is an important safety feature to ensure that the vaccine strain cannot initiate transmission in nonendemic locations where travelers might be immunized before a trip to Africa or Asia. But it still provokes an immune response to protect against future chikungunya infections.

Such a live virus vaccine would also be relatively economical to produce in large quantities — an important factor given the limited resources available in the areas hit hardest by chikungunya.

"We need to slow this virus down in India and Southeast Asia, not just to protect the people there but to reduce the very real risk that it might become endemic here after an infected traveler arrives," Weaver said. "The best way to do that is with a vaccine, and if you're going to make a vaccine you have to look at where it's going to be used and what they can afford."

UTMB has signed a license agreement with Inviragen for commercialization of the new vaccine candidate. In addition, the two partners have been chosen to receive a four-year, $3 million grant from the National Institutes of Health to complete the preclinical development work needed submit an investigational new drug application to the Food and Drug Administration, opening the door to human trials.

Provided by University of Texas Medical Branch at Galveston