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Pitt CVR and Sanofi Pasteur collaborate to assess the effectiveness of a dengue vaccine

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The University of Pittsburgh Center for Vaccine Research (CVR) and Sanofi Pasteur, the vaccines division of Sanofi, have entered a scientific collaboration to help assess the effectiveness of a dengue vaccine once introduced for immunization programs. Pitt's CVR is creating the new test to help assess the effectiveness of Sanofi Pasteur's dengue vaccine candidate, which aims to reduce cases of dengue and the circulation of the virus in the population. The new test will tell if a person's immunity to the mosquito-borne virus is due to a previous natural infection or from vaccination.

"Distinguishing whether a person's immune response is from the vaccine or from infection by a mosquito can play an important role in the assessment of a candidate vaccine," said Ernesto Marques, M.D., Ph.D., associate professor of infectious diseases and microbiology at Pitt's CVR. "The goal of this test is to provide additional support in assessing the effectiveness of the vaccine after introduction." Dengue disease is caused by four types of dengue virus. It occurs mostly in tropical and subtropical countries, putting about half the world's population at risk. It is endemic in Puerto Rico and locally acquired cases re-emerged recently in the Florida Keys and Texas. There is no treatment for dengue and no vaccine to prevent it.

It is estimated that around 100 million clinical cases of dengue occur annually, but a larger number of additional cases are so mild that the people who are infected don't even realize it. Each year 500,000 people, including children, develop severe dengue, characterized by high fever,

uncontrolled bleeding, respiratory distress and organ failure.

"For every symptomatic case of dengue, there could be as many as three asymptomatic, or "silent" cases, according to recent international research. The new dengue test will be important to fully understand the impact of vaccination by providing additional support in assessing symptomatic versus silent infections, ultimately helping officials gauge how much a vaccine reduces disease transmission," said Nicholas Jackson, Ph.D., head of dengue research and development for Sanofi Pasteur.

"This test also could be used by the government and health agencies to manage an immunization program," added Dr. Marques. "It will give evidence that the vaccine works and could allow doctors to determine which populations still need vaccination so they can most effectively target their immunization outreach efforts."

The Sanofi Pasteur dengue vaccine candidate was found to be safe and demonstrated protection against three of the four dengue virus types in the first efficacy clinical study, with results reported in 2012 in The Lancet, a medical journal. The study, which included 4,002 children, was conducted in a region of Thailand where dengue is highly endemic, and it was the first time a dengue vaccine candidate showed protection against the virus. Data from Sanofi Pasteur's ongoing phase III clinical studies with over 31,000 volunteers are expected to be available later this year and will document efficacy of their vaccine in a broader population and different epidemiological environments.

Pitt has a strong history in dengue research, most notably the first isolation and characterization of two of the four types of dengue virus in 1958 by William M. Hammon, M.D., Ph.D., then a professor of microbiology and epidemiology at Pitt's Graduate School of Public Health. In 1980, Donald S. Burke, M.D., currently the CVR co-director

and dean of Pitt Public Health, isolated dengue type 2 viruses in Bangkok.

Provided by University of Pittsburgh Schools of the Health Sciences