Silencing mosquito gene could slow spread of disease

August 28, 2017 4:30 PM
New Wave staff newwave@tulane.edu

A. aegypti mosquitos play a leading role in spreading diseases such as Zika and dengue viruses. (Photo from the Centers for Disease Control)

A. aegypti mosquitos play a leading role in spreading diseases such as Zika and dengue viruses. The research team, led by Patricia Y. Scaraffia, assistant professor in the Department of Tropical Medicine and member of the Vector-Borne Infectious Disease Center at the School of Public Health and Tropical Medicine at Tulane University, found that they increased mosquito deaths and decreased egg laying by altering the way female mosquitoes use a crucial protein called xanthine dehydrogenase 1 (XDH1).

“XDH1 plays an essential role in blood-fed Aedes aegypti mosquitoes and that silencing of XDH1 gene promotes a blood feeding-inducedadulticidal activity,” explains Scaraffia. By blocking this gene, the female mosquito can’t produce uric acid after a blood meal, which means the mosquito’s body can’t remove waste. As a result, mosquitoes lay fewer eggs and die early.
“This novel finding can help researchers to design metabolism-based strategies to control populations of *A. aegypti* mosquitoes, vectors of diseases of public health significance,” says Scaraffia, adding that the team’s research has shown that either reducing the amount of XDH1 or blocking it entirely are effective ways to target mosquitos.

Co-authors include Jun Isoe, research scientist at the University of Arizona; Tulane post-doctoral fellow Natthida Petchampai; University of Arizona undergraduate Yurika E. Isoe; Tulane laboratory research scientist Katrina Co; and Stacy Mazzalupo, assistant scientific investigator at The University of Arizona. Financial support came from the Corine Adams Baines Professorship Award and a grant from the U.S. National Institutes of Health, National Institute of Allergy and Infectious Diseases Grant (NIH/NIAID).