New $1.9 million grant will help Tulane researcher search for clues in mosquito metabolism

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Dr. Patricia Scaraffia, an assistant professor at the Tulane University School of Public Health and Tropical Medicine, has been awarded $1.9 million over five years from the National Institutes of Allergy and Infectious Diseases to study how Aedes aegypti mosquitoes metabolize ammonia. A better understanding of mosquito metabolism could lead to the discovery of novel ways to control the spread of viruses like Zika, dengue, yellow fever, and chikungunya, which are spread by Ae. aegypti.

Despite aggressive worldwide attempts to control mosquito populations, current strategies remain only partially effective. Researchers know that ammonia, one of the metabolic by-products of a mosquito's blood meal digestion, cannot be stored inside cells.

In the absence of a urea cycle for ammonia disposal, mosquitoes avoid ammonia toxicity either by directly excreting the ammonia or metabolizing it efficiently through specific pathways. Scaraffia seeks to discover how those pathways that lead to ammonia detoxification are regulated.

"Our research is expected to uncover mosquito-specific regulatory mechanisms under high demands of ammonia detoxification. It is also expected that what can be learned in Aedes aegypti mosquitoes through traditional and advanced technologies will be broadly applicable to identify regulatory mechanisms in other arthropod vectors of diseases, as well as in other biological systems," Dr. Scaraffia said.

If successful, the identification of metabolic targets or regulators in mosquitos could assist in the development and implementation of better mosquito control strategies

to improve public health.