

Proteins may affect behavior and physiology of female mosquitoes

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Researchers have identified 93 seminal fluid proteins and 52 sperm male-derived proteins that include candidates likely to affect the behavior and physiology of female mosquitoes of the species, *Aedes aegypti*. The results of this research, conducted by Laura Sirot (now at the College of Wooster) and fellow researchers in the labs of Laura Harrington and Mariana Wolfner at Cornell University and José Ribeiro at the National Institutes of Health, will be published on March 15th in the open-access journal *PLoS Neglected Tropical Diseases*.

Building on previous research which indicated that the act of mating alters the reproductive behavior of female [mosquitoes](#) in areas such as egg production, feeding patterns, and receptivity to mating, these researchers are hoping to measure the effect of these proteins to see how eliminating them might alter the behavior of the blood-sucking female (males don't bite). The study was conducted on yellow fever mosquitoes, which carry that virus as well as dengue (den-GAY) fever virus, which causes a potentially lethal infection that affects millions of humans annually. These mosquitoes are also related to the Asian Tiger Mosquito, which can transmit West Nile virus and Eastern Equine Encephalitis (swelling of the brain) — both potentially life-threatening illnesses.

"What we have been able to do is identify the proteins that males transfer to the female," says Sirot, "and by distinguishing between male-derived and female-derived proteins within the female reproductive tract, we can begin to determine which male-derived proteins affect the behavior and physiology of the females, and how they do it." Some

proteins are of particular interest because of their potential roles in modulating sperm fertilizing ability, as well as the role they might play in the synthesis of hormones and activating or deactivating other proteins. What this means, according to Sirot, is that scientists might be able to use these proteins to develop new approaches for regulating female reproduction, blood feeding, and mating behavior.

These approaches to mosquito control could be an alternative to the use of pesticides. Sirot and her fellow researchers are developing approaches which could provide a foundation for innovative new control strategies, such as reducing egg production and curbing the female's appetite for blood, which will ultimately reduce the spread of these life-threatening illnesses.

Provided by Public Library of Science

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