

Allatotropin neuropeptide signaling, juvenile hormone homeostasis and the *Aedes aegypti* gonotrophic cycle

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Abstract Details

Nutrient homeostasis is intrinsically linked to mosquito behavior. Female mosquitoes use vertebrate blood meals to nourish their eggs. After a female mosquito ingests a blood meal, she abruptly shifts her behavior. No longer does she seek human hosts, she now avoids them and rests away from predation while her eggs develop. Then, the female mosquito searches for standing water where she will lay her eggs. Only after the female deposits her eggs is attraction to host stimuli recovered and the gonotrophic cycle begins anew. The gonotrophic cycle in *Aedes aegypti* is clearly defined, but the molecular mechanism that links nutrient levels, oogenesis, and behavior is poorly understood. Juvenile hormone (JH) levels show stereotyped changes during the gonotrophic cycle and regulate oogenesis, but the behavioral role of JH is unknown. Allatotropin neuropeptide signaling has been previously shown to promote JH production. When nutrient levels are high in the adult female, JH levels are increased and her reproductive capacity is maximized. Although allatotropin has been implicated in the regulation of JH, a role for allatotropin signaling in feeding behavior has not been shown and genetic analysis of this pathway may provide insight into the behavioral role of JH. Using a genome editing approach, we seek to disrupt the function of both the allatotropin neuropeptide and its receptor to assess the role of this signaling pathway in JH synthesis and mosquito foraging behaviors.

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