Accepted Manuscript

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PII: S0145-305X(17)30513-X

DOI: 10.1016/j.dci.2017.12.025

Reference: DCI 3066

To appear in: *Developmental and Comparative Immunology*

Received Date: 27 September 2017

Revised Date: 20 December 2017

Accepted Date: 29 December 2017

Please cite this article as: Liu, T., Xu, Y., Wang, X., Gu, J., Yan, G., Chen, X.-G., Antiviral systems in vector mosquitoes, *Developmental and Comparative Immunology* (2018), doi: 10.1016/j.dci.2017.12.025.

Antiviral systems in vector mosquitoes.

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【Abstract】Mosquito-borne viral diseases represent a major challenge to human public health. As natural vectors of arboviruses, mosquitoes can be infected by a virus, but they have evolved multiple mechanisms to tolerate constant infection and restrict viral replication via their antiviral immune system. In a state of continuous infection, a mosquito can transmit an arbovirus while obtaining a blood meal from a mammalian host. During infection, the virus is mainly inhibited through a small RNA-mediated interference mechanism. Within mosquitoes, the invaded viruses are recognized based on pathogen-associated molecular patterns, leading to the production of cytokines. These cytokines in turn bind pattern recognition receptors and activate Toll, IMD and other immune signalling pathways to expand the immune response and induce antiviral activity via immune effectors. Interestingly, the gut microbiota and *Wolbachia* also play a role in mosquito antiviral immunity, which is very similar to acquired immunity. This review describes the advances made in understanding various aspects of mosquito antiviral immune molecular mechanisms in detail and explores some of the unresolved issues related to the mosquito immune system.