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Antiviral systems in vector mosquitoes

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1 **Antiviral systems in vector mosquitoes.**

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

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