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Discovery of anti7-viral molecules and their vital functions in *Bombyx mori*

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Abstract

The silkworm *Bombyx mori* (*B. mori*), a lepidopteran model organism, has become an important model for molecular biology researches with its genome completely sequenced. Silkworms confront different types of virus diseases, mainly including those caused by *Bombyx mori* nucleopolyhedrovirus (BmNPV), *Bombyx mori* densovirus type 1 (BmDNV-1), *Bombyx mori* bidesovirus (BmBDV) which was termed as *Bombyx mori* densovirus type 2 (BmDNV-2) or *Bombyx mori* parvo-like virus (BmPLV) before in sericulture. *B. mori* offers excellent models to study the molecular mechanisms of insect innate immune responses to viruses. A variety of molecules and pathways have been identified to be involved in the immune responses in the silkworm to viruses, such as the antimicrobial peptides, prophenoloxidase-activating system, apoptosis, ROS, small RNA and related molecules. Here in this review, we summarize the current research advances in molecules involved in silkworm anti-virus pathways. Moreover, taking BmNPV as an example, we proposed a schematic model of molecules and pathways involved in silkworm immune responses against virus infection. We hope this review can facilitate further study of antiviral mechanisms in silkworm, and provide a reference for virus diseases in other organisms.

Highlights

- A schematic model of molecules and pathways from *Bombyx mori* against BmNPV is proposed.
- Autophagy is proposed to be involved in virus replication in silkworm.
- Underline the important of using proper internal references in virus infection researches in silkworm.

Keywords: *Bombyx mori*; BmNPV; BmCPV; BmDNV; BmBDV; autophagy; immune response; molecular mechanism

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