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Program & Abstracts

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PI54

Molecular cloning and effects of TmCactin gene silencing on *Tenebrio* larval mortality

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Innate immune system is very important to protect host itself from pathogenic microorganism infection in insect. Cactin, cactus-interacting protein was for the first time identified in Drosophila and was discovered to be involved in dorsal-ventral patterning and intracellular toll signaling cascade. In the present study, we have identified and functionally characterized *Tenebrio Cactin* (*TmCactin*) in the beetle, *Tenebrio molitor* by RNASeq/EST. Analysis of RNA interference indicates that TmCactin plays an important role in Gram-negative and -positive bacteria infection, not fungal infection in *T. molitor* larvae.

Key words: Toll signaling, Cactin, *Tenebrio molitor*, Microbial infection, RNA interference, AMP

PI56

Functional characterization of Tm14-3-3ζ on autophagy signaling in *Tenebrio molitor*

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14-3-3 is a family whose members are highly conserved eukaryotic proteins that play pivotal roles in the regulation of cell survival, apoptosis, and signal transduction. In this study, two isoforms of the *Tenebrio* 14-3-3 proteins, Tm14-3-3ε and Tm14-3-3ζ, were identified and their functions in countering pathogenic infections were investigated. A peptide-based polyclonal antibody was generated for determination of subcellular localization of Tm14-3-3ζ. Tm14-3-3ζ is localized in the membranes of midgut epithelial cells, nuclei of the fat body and cytosol of hemocytes but little or no in Malpighian tubules. A confocal microscopic analysis, furthermore, revealed that Tm14-3-3ζ protein and the signals for LysoTracker as an autolysosome signal were not merged. During a critical window of larval to pupal transition, expression levels of *Tm14-3-3ζ* were inversely correlated to the acidification levels of lysosomes. Injection of C-2 Ceramide revealed a time-dependent increase in the transcripts of *TmATG8* whereas it decreases in the expression level of *Tm14-3-3ζ* transcripts in the first hour. Depletion of Tm14-3-3ζ triggers the conversion of TmAtg8-I to TmAtg8-II (active form) as determined by Western blot analysis with TmAtg8 polyclonal antibody. Our results suggest that Tm14-3-3ζ protein has negative regulatory roles in autophagy.

Key words: *Tenebrio molitor*, 14-3-3ζ, Autophagy, Atg8