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Program & Abstracts

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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