

Immune activation of apolipoprotein-III and its distribution in hemocyte from *Hyphantria cunea*

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Apolipoprotein-III is a hemolymph protein whose function is to facilitate lipid transport in an aqueous medium. Recently, apolipoprotein-III in *Galleria mellonella* larvae was shown to play an unexpected role in insect immune activation. We identified the cDNA sequence of *Hyphantria cunea* apolipoprotein-III by oligonucleotide-primed amplification, and 5'- and 3'-RACE PCR. Since *H. cunea* has an unusually low level of apolipoprotein-III in the hemolymph, a recombinant apolipoprotein-III was overexpressed using a baculovirus expression system to investigate its biological activity. Recombinant apolipoprotein-III and/or *E. coli* were injected into the hemocoel of last instar larvae, and the expression of antimicrobial peptide from fat body was determined by Northern blot. Injection of apolipoprotein-III as well as *E. coli* induced slight up-regulation of its transcription rate in fat body, whereas the expression of antimicrobial peptide dramatically induced by the injection of apolipoprotein-III and *E. coli*. *H. cunea* hemocytes had apolipoprotein-III in the granules and expressed its transcript, albeit at a much lower level than in the fat body. Upon bacterial injection, a subpopulation of hemocytes showed degranulation and degradation. Local discharge of apolipoprotein-III from hemocytes caused by the injection of *E. coli* might be related to the immune response through an unknown mechanism.