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# Molecular mechanisms of trans-generational immune priming in invertebrates - the case study of the mealworm beetle.

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## Abstract

While the transfer of immunity from immune-challenged females to their offspring is a well described process in vertebrates, it was thought to be impossible in invertebrates, notably due to the absence of antibody-like systems. Since its first description in bumble-bees in 2001, trans-generational immune priming (TGIP) has been observed in several other invertebrate species. Nevertheless, the molecular mechanisms of TGIP are yet to be elucidated. To elucidate these mechanisms, we focused on the model coleopteran *Tenebrio molitor*. Eggs were collected from females challenged with Gram positive (*Bacillus thuringiensis*) and Gram negative bacteria (*Serratia entomophila*). Global proteomic approach (2D-DIGE, MS/MS) were used to identify proteins differentially abundant between eggs from immune-challenged and from naïve *T. molitor* females. The first comprehensive characterization of all antimicrobial peptides (AMPs) present in eggs from immune-challenged females was also conducted. Altogether, these results provide new insights into mechanisms at play in TGIP.

**Keywords:** trans, generational immune priming, TGIP, Coleoptera, Invertebrate immunity, Innate immunity, Proteomic, antimicrobial peptides

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