Characterization of Germ cell-expressed gene during pre-imaginal development of *Apis mellifera*

Depintor, T.S.[1]; Abreu, F.C.P.[2]; Simões Z.L.P.[1,2]

[1] Faculdade de Medicina de Ribeirão Preto – USP, [2] Faculdade de Filosofia Ciências e Letras de Ribeirão Preto – USP.

Complexes gene network of interactions are activated in response to juvenile hormone (JH) during development of insects. In holometabolous insects, these networks are responsible for morphological and physiological changes, which characterize different stages of development such as egg, larvae, pupae and imago. During larval phase, JH binds to transcription factors – highlight for *germ cell-expressed* (*gce*) – giving rise to a complex which promotes transcription of genes responsible for transducing the antimetamorphic action of JH. The hormone JH is at the top of the hierarchy of this signalling pathway, however environmental factors are known to influence its circulating levels in the haemolymph. Our organism model *Apis mellifera,* has peculiarities that make it an important target for this study, the presence of caste differentiation modulated by environmental factors. During development, queen destined larvae may reach up to 20 times higher JH titers than workers. This study showed in workers *gce* is differentially modulated by JH, according to developmental phase; we also demonstrated GCE in workers is an important component in the pathway, responsible for transducing JH signal, since its silencing (RNAi) severely affects development, leading to cuticle blackening. Finally, we showed in pink-eyed pupae of queens *gce* has basal expression levels, in contrast to the peak of expression observed in workers. There are several studies showing JH effects and its control over premature molting in many insect classes, however, the molecular pathway triggered by this hormone is not well understood. This study contributes to a better understanding of the signalling pathway triggered by JH during development of *A. mellifera*, an extreme important group of pollinators, which currently are strongly affected by uncontrolled use of pesticides analogues of JH.

Key words: Germ-cell expressed, *Apis mellifera*, metamorphosis, Juvenile hormone, JH analogue.

Funding agency: São Paulo Research Foundation - FAPESP (Process n°: 2020/04166-4 – Fellowship, 2019/02374-1 – Regular research grant)