

MOLECULAR AND FUNCTIONAL HETEROGENEITY OF HONEYBEE HEMOCYTES

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Honeybee is an eusocial insect with cosmopolitan distribution; it belongs to the *Hymenoptera* ordo. It has a substantial impact in pollination, thus in the development of biodiversity, as well as, they are vital in producing honey. In honeybee colonies, among other set of symptoms, Colony Collapse Disorder has become common worldwide in the past few years causing major economic losses. Immunity has a special role in the defense against the microbial and parasitic damages which honeybees are exposed to. In order to reduce this economic damage it is necessary to understand the host-pathogen interactions, mainly, through the investigation and understanding the structure and the machinery of honeybee immunity. Like other insects, honeybee has an effective immune system with a cellular- and a humoral module. Moreover, being a social species, honeybee uses alternative strategies, like hygienic behavior and hive-fever, thus its immune response may have special elements as compared to well known model-organisms. Humoral components of the honeybee's immune response were identified, however, our understanding of the cell-mediated immune-response is negligible. Circulating cells, so called hemocytes, have been detected in the hemolymph, however, their function and the differentiation of various blood cell populations and the existence of hematopoietic tissue/s have not been revealed yet.

The aim of our research is to develop a toolkit for the characterization and classification of the honeybee's hemocytes. We have identified clustered immunological markers on the basis of their expression patterns on hemocytes of the larva and of the adult. Furthermore, a correlation between the expression-pattern of the markers and the function of the blood cells was revealed.

These hemocyte specific markers offer means to study the cell mediated immunity of the honey bee and a tool for the identification of hematopoietic tissues and hemocyte lineages with characteristic functional properties in this economically important species.