Detecting Immune Response Proteins in the Honey Bee

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Speaker Bio

I completed a Bachelor of Science in biology at the University of Western Australia. For my honours work I investigated the effects of an agricultural pesticide and disease on honey bee health and fertility, at the Centre of Integrative Bee Research (CIBER). Currently I am a PhD student in Dr Julia Grassl's lab in the CRC for Honey Bee Products, researching bee immunity.

Presentation

Honey bees are susceptible to a large range of parasites and pathogens, and infections can significantly affect colony health and productivity. Bees are not defenceless however, and possess a fairly complex innate immune system, as well as a suite of behavioural adaptations, such as hygienic behaviour, which are collectively known as social immunity. Disease management includes selectively breeding for some of these disease resistant traits. Several social immunity traits are currently incorporated in breeding programs around the world, but innate immunity is not as well understood. Originally thought to produce broad and non-specific responses, invertebrate innate immune systems are now known to have some form of immune memory and show a high level of specificity. Despite this knowledge, we are still lacking details of the specific responses towards different parasites and pathogens in bees. This project is profiling the immune response of honey bees towards the common fungal pathogen *Nosema apis*. To do this we used mass spectrometry to quantitate proteins from infected male bees over a time course synonymous with males reaching sexual maturity. We investigated local immune responses in the gut, fat body and head, establishing a detailed immune response profile, and identifying potential immune molecules to investigate resistance. We found immune response profiles change considerably with bee age; and the majority of immune response proteins decreased in abundance as the bees' senesce.