

Identification of proteins involved in the immune system of the beetle
Euoniticellus intermedius

Rodney Hull, Chris Arnot and Monde Ntwasa

School of Molecular and Cell Biology, University of the Witwatersrand

Euoniticellus intermedius is a scarab beetle that displays high fecundity and lays the brood mass in tunnels below the soil surface. It is native to Africa and the Middle East, but has been successfully introduced into Australia to help deal with excess cattle dung. One of the responses of the innate immune system of *Drosophila melanogaster*, is the synthesis of antimicrobial peptides following the activation of the Toll receptor. Both Toll and antimicrobial peptides have been identified in the insect order of coleoptera. The study of the immune response of insects may provide new antibiotic agents, as well as insights into the control of agricultural pests and insect borne diseases. The study of the innate immune system of insects has also previously elucidated homologous systems in mammals. This study involves the isolation of Toll homologs and antimicrobial peptides from *Euoniticellus intermedius* embryos, larvae and adults. Inducible antimicrobial peptides have been identified in fungal challenged adult beetles using cation exchange and C18 columns. Based on their size and chemical characteristics these peptides appear to be a member of the family of insect defensins, however attempts to obtain amino acid sequences from fractions displaying inhibition activity using mass spectroscopy have not been successful. PCR using guessmers based on alignments of orthologous toll proteins were used to obtain several amplicons, which are undergoing analysis. Western blots and immunoprecipitation using *Drosophila* Toll antibodies resulted in the detection of a 110 kDa peptide.