Genetic Technologies in honeybees

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Honeybees (Apis mellifera) live in sophisticated societies consisting of thousands of sterile female workers, a female queen and hundreds of males (drones). The honeybee displays a rich behavioral repertoire, social organization, caste differentiation and has an interesting mode of sex determination. Honeybees are also economically important due to their pollination services. The systematic studies of the processes underpinning those interesting phenotypes were in the past limited due to the lack of genetic tools. Gene manipulations methods usually require the generation of fertile offspring and crosses. Hence, the application of these methods is usually limited by the number of colonies that can be maintained. I will report on progress in overcoming these limitations by screening and manipulating genes using the CRISPR/Cas9 method. I will also present data on improved genetic transformations and misexpressions of transgenes. We hope that this work will contribute to genetic tool that can systematically study biological processes in honeybees.