



## **CRISPR/Cas9-based genome editing in social insects: practical considerations and future directions**

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Since 2013, CRISPR/Cas9 has emerged as a breakthrough technology facilitating molecular biology research in traditional and non-traditional model organisms. In addition to simple null mutants, CRISPR/Cas9 can be used for more complex genetic experiments, such as transgenics, conditional mutants, and modulation of gene expression. While much of the attention surrounding CRISPR/Cas9 has been focused on creating stable germ-line mutants, this technology can also be used to conduct informative genetic experiments in genetic mosaics (similar to the way RNAi is used). We recently reported our first proof-of-concept efforts to establish a CRISPR/Cas9 protocol in the clonal raider ant, testing the hypothesis that odorant receptors are employed in pheromone perception in ants. In this presentation, we will discuss how we developed this protocol and provide some practical considerations for researchers who would like to develop CRISPR/Cas9 protocols in other social insect species. We will also discuss our ongoing efforts to improve this protocol using new types of reagents and techniques. CRISPR/Cas9 has enormous untapped potential to advance social insect research, and we hope to encourage more researchers to adopt this exciting new technology.