



The molecular basis for waggle dance communication in the honey bee *Apis mellifera*

Author(s): Fabio Manfredini, Fabio Manfredini , Yannick Wurm , Elli Leadbeater

Institution(s): School of Biological Sciences, Royal Holloway University of London, Egham UK ; School of Biological and Chemical Sciences, Queen Mary University of London, London UK ; School of Biological Sciences, Royal Holloway University of London, Egham UK ; School of Biological Sciences, Royal Holloway University of London, Egham UK

The waggle dance is a stereotyped behaviour that honey bees use to share information about the location of a new food source or a new home with other members of the colony. There are two key components in this behaviour: 1) the translation of the spatial information into a simple movement performed by the dancer; 2) the decoding of the dance operated by dance followers. Despite the wide range of experimental work performed on the honey bee waggle dance, we still know very little about the molecular mechanisms regulating this fascinating behaviour. In this study, we have adopted a transcriptomic approach to underpin the genetic regulation of both components of the waggle dance. We have performed the RNAseq analysis of mushroom bodies from bee dancers that were trained to artificial feeders placed in different locations, and from dance followers that followed these dances. We present the output of the RNAseq experiments in terms of differentially expressed genes, and also in terms of biological processes, metabolic functions and co-expression networks associated with these genes. Finally, we discuss our findings in the broader context of the molecular regulation of complex behaviours and social learning in animals.