RECENT RESEARCH ACTIVITIES

International collaboration work with a group in France

(Laboratory of Innovative Humano-habitability, RISH, Kyoto University)

Aya Yanagawa

Recently I have been working with the Marion-Poll lab in Center national de la recherche scientifique (CNRS), the largest governmental research organization in France, to analyze how Drosophila can detect microbes with their taste system and brush them of their cuticula to limit pathogenic infections. This collaboration work has started in 2013 with the generous support of Kyoto University on John Mung Program and we keep continuing this collaboration project in Japan and France. Though the collaboration level is not large, we could produce the first paper in 2014, last year and I'd like to share that work here.

Bacterial compounds induce grooming and stimulate taste sensilla on the wings of Drosophila

In many insects, grooming is considered as a behavioural defence against pathogen and parasite infection since it contributes to remove microbes from their cuticle. However, the stimuli that trigger this behaviour are not well characterized. In this work, we demonstrate that grooming activities in *Drosophila melanogaster* are induced by taste stimuli. We monitored the grooming responses of decapitated flies to general tastants (quinine, sucrose, KCl), to bacterial compounds e.g. dead *Escherichia coli* (Ec) and lipopolysaccharides (LPS). Grooming responses were triggered most efficiently when touching the distal border of the wings, in response to quinine, LPS and Ec while the responses were completely absent in mutants deprived of external taste sensilla. We monitored the electrophysiological responses of taste sensilla of the distal border of the wings, confirming that these taste sensilla are fully functional, and that they respond not only to quinine, Ec and LPS but also to sucrose and KCl. These results demonstrate for the first time that wing taste sensilla detect chemicals from bacteria, and that these sensilla are directly involved in triggering grooming movements driven by the ventral nerve cord. This work is published in Frontiers in behavioral neuroscience (2014: doi: 10.3389/fnbeh.2014.00254).

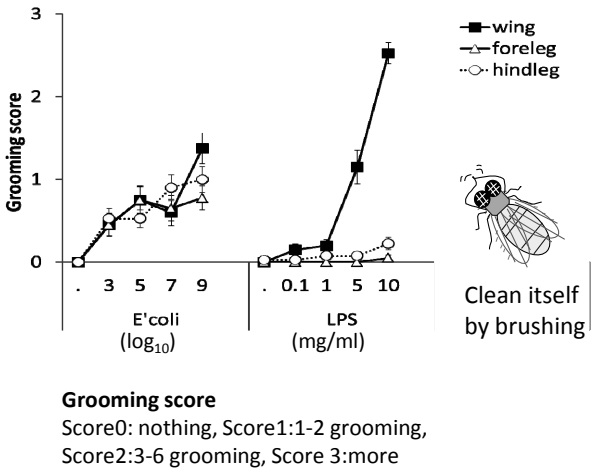

Fig.1 Grooming induction by bacterial compounds

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