 doi:10.1093/chemse/bjp093

IN THIS ISSUE

Articles Highlighted

The Soluble Proteome of *Drosophila's* Antennae

Page 21

The olfactory system of *Drosophila* has been extensively characterized. Odor molecules interact with olfactory sensory neurons particularly but not exclusively present in the main olfactory organs, that is, the sensilla of the third antennal segment and the maxillary palps. To date, selected proteins have been studied in the third antennal segment by immunohistochemistry and in situ hybridization, methods that usually handle only few molecules of interest at a time and do not allow precise quantification easily. Moreover, the small size of target tissue hampered the biochemical purification of antennal proteins. Anholt and Williams have now established a protocol for the large-scale detection of soluble antennal proteins originating from the extracellular perilymph and cytoplasm of disrupted cells. It involves chromatographic separation of tryptic peptides followed by sensitive tandem mass spectrometry. The authors detected odorant-binding proteins and proteins serving different other cellular functions. The authors propose that their method opens the way for reliable quantification of any *Drosophila* antennal protein and would be applicable to antennae of other insects including pests that use olfactory cues for host identification, mating, and oviposition.

Odors Influence Respiratory Patterns in Sleep

Page 31

Arzi et al. assessed the potential of odors for treating sleep apnea. An olfactometer delivered pleasant and unpleasant mildly trigeminal or pure olfactory odorants transiently every 9, 12, or 15 min to healthy sleepers. The treatment did not increase the frequency of arousals or wake, yet it influenced respiration. All 4 odorants transiently decreased inhalation and increased exhalation for several breaths following odor onset regardless of odorant valence or phase of sleep. Based on their findings, the authors propose that the olfactory system could provide an approach to manipulate respiration in sleep.

Attraction of Female Grapevine Moth to Olfactory Cues from Host Plants

Page 57

In principle, attraction of herbivorous insects with more than one host plant such as the grapevine moth, *Lobesia botrana*, to host odor could be elicited by specific or common chemicals or by combinations of both. It is been known that mixtures of odor molecules mediate attraction of female moths to the host *Vitis vinifera*. By using a combination of chemical analysis and electroantennographic detection, Tasin et al. now identified olfactory cues in the wild host *Daphne gnidium*. The authors show that mated female moths were attracted to synthetic blends consisting only of common or only of specific chemicals. However, higher attraction was seen when specific compounds have been added to the blend of shared compounds. As the authors point out, this plasticity might, in combination with plant abundance and larval suitability, constitute an important factor for forming new insect–plant interactions.

Methyltestosterone and Courtship Behaviors of Cyprinids

Page 65

In the tinfoil barb, increased olfactory sensitivity to a female pheromone induces sexual behavior in androgen-treated juvenile fish. Belanger et al. now investigated, by electroolfactometry and behavioral assays, the effect of 17α-methyltestosterone on pheromone detection and sex behavior in juveniles of 4 cyprinid species. The authors observed that their treatment enhanced the magnitudes and sensitivities of olfactory responses to prostaglandins in all 4 species. In zebra fish, these responses were similar in juveniles and adult males, whereas the responses of control fish resembled those of adult females. In parallel, courtship behavior was increased in redtail sharkminnows. Thus, it appears that the androgen-mediated increase in olfactory responsiveness to pheromones is common in cyprinids, offering approaches to unravel the development of sexually dimorphic olfactory-mediated behavior.

Wolfgang Meyerhof