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Articles Highlighted

Sucralose preference predicts responses to sweet and bittersweet tastants

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Sucralose is a non-caloric, artificial, high intensity sweetener produced by chlorination of sucrose. Based on different behavioral paradigms rats can be classified as sucralose avoiders or preferrers. Loney et al now demonstrate that sucralose avoidance in rats is associated with decreased preference for and intake of saccharin, a sweetener having a bitter off-taste, and bittersweet sucrose-quinine binary mixtures. In addition, sucralose avoiders showed lower acceptability thresholds for sucrose relative to sucralose preferrers. However, sucralose avoiders and preferrers did not differ in their unconditioned licking responses to the bitter compound quinine or salty sodium chloride solutions. From these data the author conclude that phenotypic differences in sucralose preference indicate general differences in the hedonic processing of sweet and bittersweet taste stimuli.

Peripheral and central olfactory tuning in a moth

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Animals including moths are innately attracted by certain odorants. Ong and Stopfer investigated in moths if salient host plant attractants induce relatively strong olfactory responses helping animals to detect the most relevant odors or if specific neural wiring links innately preferred odors to relevant behaviors circumventing intensity bias. By recording electroantennograms the authors observed that, overall, innately preferred host plant odors did not produce stronger responses than other volatiles. Further local field potential analyses revealed that signals induced by odorants, which have been previously diluted to elicit equal output from the antennae, were faithfully transmitted from the antennal lobe to the next neural target, the mushroom body without experiencing differential amplification. Moreover, moths learned equally well to associate all tested odorants with food rewards. The authors conclude that innately preferred host plant odors appear to be linked to attractive behaviors through specific wiring in the moths' brain.

Distinct odorous fatty aldehydes activate the mammalian-specific odorant receptors 37

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In order to recognize the countless structurally diverse odorants, mammals use a large repertoire of odorant receptors (OR). Among the numerous OR, a small subfamily, OR37, shows unique special properties. OR37 family members display unusually high sequence identity and share a 6 amino acid insertion in their third extracellular loop. The olfactory sensory neurons that express OR37 family members are not scattered throughout the sensory epithelium but concentrate in a small epithelial patch and project to a single glomerulus instead of two. The fact that OR37 members are confined to mammalian species suggests that they recognize odorants with particular relevance for mammals. Bautze et al tested the hypothesis that OR37 members respond to long hydrocarbons produced by the sebaceous glands of mammals whose waxy secretions protect their hairy skin. To this end they used genetically engineered mice allowing unequivocal visualization of OR37 glomeruli. They exposed these mice to waxy compounds and monitored induction of the neuronal excitation marker, cFos, in OR37-juxtaglomerular cells. Long-chain aliphatic aldehydes but not the corresponding alkanes activated OR37 glomeruli. Each OR37-positive glomerulus responded best to an aldehyde of definite chain length, indicating that OR37 receptors are tuned to distinct fatty aldehydes.

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