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Articles Highlighted

Serotonin Reuptake Inhibitor and Licking Responses to Taste Stimuli by Rats

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Serotonin and its receptors play a role in taste transduction. Moreover, the serotonin reuptake inhibitor, paroxetine, increases taste sensitivity to sweet and bitter compounds and serotonin analogs decrease food and fluid intake suggesting that the serotonin system affects taste hedonics and/or physiological states relevant for ingestive behavior. Mathes and Spector now investigated the effect of paroxetine on unconditioned licking of prototypical taste stimuli by rats in brief access tests that allow separation of appetitive from consummatory components of ingestive behavior. The authors did not observe any effect of the drug on concentration-dependent licking of rats to prototypical taste stimuli relative to water at doses that decreased food intake. Thus, taste-guided consummatory behavior characterized by contact of the stimulus with the sensory receptors appears not to be affected by the drug. In contrast, paroxetine decreased the number of trials to sucrose and NaCl under water-deprived conditions suggesting that systemic increase in serotonin attenuates appetitive behavior at least in some conditions.

Gene Polymorphisms Affect Umami Receptor Function

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Umami taste is elicited by monosodium glutamate (MSG) and enhanced by ribonucleotides. Umami stimuli are recognized by a heteromer of 2 G protein-coupled receptor subunits, T1R1 and T1R3. They are characterized by large extracellular amino-terminal domains that form so-called venus flytrap binding sites. Human subjects differ substantially in their MSG detection threshold values. These differences are associated with nonsynonymous single nucleotide polymorphisms in the T1R1 and T1R3 genes. Raliou et al. now investigated in cell-based receptor assays the impact of the genetic polymorphisms on receptor function. They found that 2 amino acid substitutions, A110V and R507Q, in the amino-terminal agonist-binding domain of T1R1 impaired the sensitivity of the umami receptor to MSG. They also made a similar observation for 2 other variant positions, F749S and R757C, in the transmembrane segment of T1R3. They also provide mechanistic insight into how the amino acid exchanges affect receptor function. Their data strongly suggest that gene polymorphisms alter receptor function which eventually becomes manifest in perceptual differences in the population.

Scent Signals in Otters

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Animals across taxa, including solitary Eurasian otters, use scent to signal information to congeners. However, it is only poorly understood what information about the signaler otters communicate through scent and what social role this plays. Kean et al. sampled and analyzed volatile compounds from anal scent gland secretions of numerous otters of different age, sex, and reproductive status. The authors found a total of 432 chemicals of which they identified 268 provisionally including some which were previously thought to be absent from otter scent secretions. Moreover, considerable variation was seen in the complexity of chemical profiles across samples ranging from 36 to 165 compounds. Indole and pentylfuran differed between adults and juveniles, and scent profiles of juvenile and adults were successfully discriminated. The authors also observed complex sex differences in the volatile organic compounds in adult but not young animals suggesting that otters used scent secretions in mate attraction. The clearest differences were seen between pregnant and lactating female otters and male or juvenile otters which may be due to hormonal differences. Behavioral observations suggest, however, that signaling their reproductive status is probably disadvantageous for female otters as males are known to engage in infanticide. Thus, even though female otters appear to be very secretive during pregnancy or lactation, they deposit their scats in water that helps to hide their reproductive status.

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