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Articles Highlighted

Individual Body Odors of Gorillas

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In numerous species of all major vertebrate groups, odors play a major role in guiding behaviors including but not limited to feeding, reproduction, navigation, and many aspects of social behavior. The ability to recognize the individual identity of others is of particular importance for an animal in order to identify family members, find mating partners, avoid conflicts with dominant individuals, et cetera. Many species use odor cues for sending and receiving information about individuality. Like man, great apes, however, appear to depend less on smell relative to vision and audition, entailing stagnation of research interest into olfactory abilities in these species. Using an interesting approach, Hepper and Wells now report on individual body odors of Western lowland gorillas. They collected odor samples by placing cloths in the gorilla's individual dens. Human participants were then asked to match a target odor sample to a choice of either 2 or 6 odors among which was the target odor. The participants correctly identified the target odors in both experimental settings. Interestingly, fewest errors occurred with the odor of the dominant male silverback, whereas odor recognition of young gorillas was associated with most errors. Thus, unexpectedly, gorillas produce body odors that can be discriminated by individuals of the human species. The data, of course, suggest that also gorillas, who are known to have a functional olfactory system, would be able to do so and propose that body odors play a role in the social behavior of great apes.

Phosphatidylinositol 3-kinase Signaling in Mouse Olfactory Receptor Neurons

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A longstanding and intensely disputed aspect in the field of olfaction regards the contribution of phosphoinositide signaling to olfactory transduction in sensory receptor neurons. Brunert et al. now examined the role of a major enzyme, phosphatidylinositol 3-kinase (PI3K). They found that 2 PI3K isoforms, PI3Kβ and PI3Kγ, both of which are capable of coupling to G protein–coupled receptors, are present in murine olfactory sensory neurons. Moreover, olfactory sensory neurons responded to odorant stimulation with increased PI3K activity and calcium signaling. Calcium signals were enhanced in the presence of PI3K inhibitors. In addition, odorants failed to induce PI3K activity in the olfactory epithelium of mice deficient in PI3Kγ. The olfactory sensory neurons of these mice were less sensitive to PI3Kβ and PI3Kγ inhibition than their wild-type counterparts. From their data, the authors conclude that PI3K signaling inhibits odorant responses in murine sensory receptor neurons.

Cracking Petrels' Sociochemical Code

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Chemosignaling in birds, like that in great apes, remains comparatively unexplored. Previous studies with birds mainly focused on the processing of chemical signals, reactions to environmental scents in the context of navigation, predator avoidance, or foraging but largely left out social behavior. The study by Mardon et al. investigated petrels that possess a particularly developed olfactory neuroanatomy and good olfactory abilities that the birds use for foraging and homing. The authors examined the chemical composition of secretions from the uropygial gland of 2 petrel species that is located at the dorsal base of the tail and produces volatile and nonvolatile waxy fluids spread on feathers during preening. They found that the secretions contain critical socioecological information about species, gender, and individual identity. This information was carried essentially by large esterified unsaturated compounds that could be precursor molecules for the actual airborne chemosignals. The presence of these chemosignals relates to olfactory behaviors observed in the field and likely has implications for interspecific competition, individual recognition, and mate choice.

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