



What the nose knows – How mammals navigate the odour landscape

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Sensory input across modalities is highly dynamic, continuously confronting the brain with the task of making sense of the external world. Olfaction is a key sense that many species depend on for survival, for example to locate food sources and mating partners or to avoid encountering predators. In the absence of visual cues, olfactory cues are especially useful, as they provide information over a large range of distances. Natural odours form temporally complex plumes that show rapid fluctuations in odour concentration carrying information about the location of an odour source. I will demonstrate that the mammalian olfactory system has access to unexpectedly fast temporal features in odour stimuli, at timescales of 25 ms. This in turn endows animals with the capacity to overcome key behavioural challenges such as odour source separation, figure-ground segregation and odour localisation, by extracting spatial information from temporal odour dynamics.

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