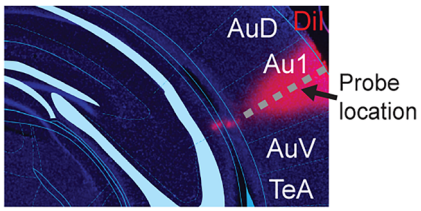
This Week in The Journal

How Odors Influence Sound Responses in the Auditory Cortex

Nathan Vogler, Ruoyi Chen, Alister Virkler, Violet Y. Tu, Jay A. Gottfried, and Maria Neimark

(see article e1140242024)

The environments we encounter in our daily lives require us to integrate many kinds of sensory information. How mammals integrate smell and sound is understudied. Herein, Vogler and colleagues investigated whether odor-processing neural circuits influence sound processing circuitry. Using a multifaceted approach consisting of anatomical tracing, electrophysiology, and optogenetics, they probed cortical circuitry to determine the circuit interactions that occur when mice are in an environment consisting of auditory and olfactory stimuli. The authors discovered that odors modulate sound responses by enhancing auditory cortex responses to sound. Notably, they also found that odor-driven sound responses rely on a projection from the piriform cortex to the auditory cortex. This work is a breakthrough in our understanding of auditory–olfactory integration that supports cortical–cortical multisensory convergence models in the field.



Representative image of probe location during in vivo electrophysiology, which was used to assess auditory–olfactory integration in the auditory cortex. See Vogler et al. for more information.

Striatal Neurons Support Rejecting Unnecessary Behavioral Options

Atsushi Yoshida and Okihide Hikosaka

(see article e0866242024)

When we strive to achieve a goal, this sometimes requires repressing unnecessary behaviors. The anterior striatum is known to play a role in inhibiting automated or reactive actions, but its role in proactively rejecting behavioral options was unknown until a study in this issue. Atsushi Yoshida and Okihide Hikosaka explored the role of anterior striatum neurons in discarding unfavorable actions using nonhuman primates. The authors recorded from the anterior striatum as two male macaque monkeys performed a task in which they selected or rejected a behavioral choice based on whether it would aid in achieving a goal. A population of neurons in the anterior striatum was involved in proactively inhibiting behavioral options. This new observation of a specific neuron population playing an important role in decision-making and cognitive control could lead to the discovery of targetable mechanisms underlying disease states in which there are cognitive deficits.

This Week in The Journal was written by Paige McKeon

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