



Talks by rising stars of neuroscience

**Expectation of self-generated sounds drives predictive processing in mouse auditory cortex**

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Sensory stimuli are often predictable consequences of one's actions, and behavior exerts a correspondingly strong influence over sensory responses in the brain. Closed-loop experiments with the ability to control the sensory outcomes of specific animal behaviors have revealed that neural responses to self-generated sounds are suppressed in the auditory cortex, suggesting a role for prediction in local sensory processing. However, it is unclear whether this phenomenon derives from a precise movement-based prediction or how it affects the neural representation of incoming stimuli. We address these questions by designing a behavioral paradigm where mice learn to expect the predictable acoustic consequences of a simple forelimb movement. Neuronal recordings from auditory cortex revealed suppression of neural responses that was strongest for the expected tone and specific to the time of the sound-associated movement. Predictive suppression in the auditory cortex was layer-specific, preceded by the arrival of movement information, and unaffected by behavioral relevance or reward association. These findings illustrate that expectation, learned through motor-sensory experience, drives layer-specific predictive processing in the mouse auditory cortex.

Event link:

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