BIOLOGICAL SCIENCES SEMINAR SERIES

"EXPERIENCE, LEARNING, AND INHIBITORY SYNAPTIC PLASTICITY IN SENSORY NEOCORTEX"

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Abstract: How does experience change the brain? Here we use sensory cues and rewards to systematically investigate how cell-type and target-specific synapses in the cerebral cortex are modified during learning. Freely-moving mice were trained in an automated, homecage system where water rewards were either coupled or decoupled from predictive sensory cues. We identify discrete pathways across the cortical column that are modified by sensory experience and learning. In particular, we discovered that GABAergic inhibition from somatostatin neurons is highly sensitive to stimulus-reward contingencies, showing layer-specific regulation of stimulus-evoked firing and synaptic inhibition. These data help differentiate passive sensory experience from learning highly predictive sensory cues and shed light onto canonical computations of the cerebral cortex.

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Monday, September 25, 2023
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