



Discovery Science
Emerging Scholars Lecture

“Next-Generation Approaches for Investigating Neuropeptidergic Circuits in Reward and Motivation”

Neuropeptides dramatically modulate neural circuits and behavior. One system, the mu-opioid peptide receptor (MOPR) system, can alter respiration, analgesia, and reward behavior, as well as induce addiction and drug overdose. Despite its evident importance, the endogenous mechanisms for MOPR regulation of appetitive behavior have remained unknown. Here I report that endogenous MOPR regulation of appetitive behavior in mice acts through a specific dorsal raphe to nucleus accumbens (NAc) projection. Select enkephalin-containing NAc ensembles are engaged prior to reward consumption, suggesting that local enkephalin release is the source of endogenous MOPR ligand. Selective modulation of NAc enkephalin neurons and CRISPR-Cas9-mediated disruption of enkephalin substantiate this finding. I also discuss emerging wireless optofluidic technologies, demonstrating how these platforms can be used for in vivo neuropeptidergic research.

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Zoom

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