

# Monthly Neuro Seminar Series

Spring 2024



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### Food or Friend: Social vs. nonsocial reward representations in the mPFC

The reinforcing nature of social interactions is necessary for the maintenance of appropriate social behavior. However, the neural substrates underlying social reward processing and how they might differ based on the sex and internal state of the animal remains unknown. It is also unclear whether these neural substrates are shared with those involved in nonsocial reward processing. We developed a fully automated, novel two choice (social-sucrose) operant assay in which mice choose between social and nonsocial rewards to directly compare the reward-related behaviors associated with two competing stimuli. We performed cellular resolution calcium imaging of medial prefrontal cortex (mPFC) neurons in male and female mice across varying states of water restriction and social isolation. We found that mPFC neurons maintain largely non-overlapping, flexible representations of social and nonsocial reward that vary with internal state in a sex-dependent manner. Additionally, optogenetic manipulation of mPFC activity during the reward period of the assay disrupted reward-seeking behavior across male and female mice. Thus, using a novel operant assay, we have identified sex-dependent, non-overlapping neural representations of social and nonsocial reward in the mPFC that vary with internal state and that are essential for appropriate reward-seeking behavior.

Tuesday, May 7  
4:00 p.m.  
Coverdell S175



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