

School of Neuroscience Faculty Candidate

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11:00am – 12:00pm
Kelly Hall 310

“Expanding the Cue in Drug Addiction”



The development of a substance use disorder relies heavily on learning mechanisms. Drug experience is linked with exteroceptive environmental stimuli through Pavlovian conditioning. These stimuli can then come to instigate goal-directed drug seeking. With experience, the behavior transitions to devaluation-resistant habitual drug seeking.

This transition is reflected in dynamic shifts of underlying neural circuitry, indicating a fundamental change in how the brain is processing the drug-associated stimuli. From a clinical standpoint, attempting to disengage the impact of these stimuli on drug seeking should be effective. Unfortunately, approaches utilizing extinction processes such as cue-exposure therapy have been less than successful at maintaining prolonged abstinence. One of the factors that may be contributing is our often narrow approach to understanding the role of the drug itself. Importantly, a drug is more than a rewarding Pavlovian unconditioned stimulus or operant reinforcer. The drug experience can also function as an internal environmental cue, indicating the presence of a distinct appetitive environmental stimulus such as a sweet liquid reward. This multi-functionality may combine synergistically to perpetuate drug seeking and taking behaviors. Understanding the functional significance of the drug experience in various learning domains will provide a more solid foundation for moving forward in elucidating the underlying neural processes and the development of treatment techniques.

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