Translation of research findings into clinical settings remains a primary challenge of modern psychiatry. Cross-validated predictive modeling (i.e., machine learning) approaches are designed to overcome limitations of traditional approaches by focusing on individual differences and generalization to novel subjects (i.e., cross-validation), thereby increasing the likelihood of replication and potential translation to novel clinical settings. Dr. Yip’s talk will present recent work demonstrating the utility of one such approach, connectome-based predictive modeling, to generate accurate predictions of addiction outcomes using neuroimaging data acquired at the start of treatment. Evidence for dissociable neural substrates of abstinence from different drugs of abuse will be presented, and recommendations for future work using brain-behavior models in psychiatry will be discussed.