MU-ARTSS Labs: Mentors and Descriptions

Based upon individual interests, students will be assigned to labs at the University that focus on one or more of the following areas: human genetics; psychiatric and genetic epidemiology; cognitive neuroscience; behavioral pharmacology; behavioral and clinical assessment; intervention; and statistical modeling. MU-ARTSS interns will work alongside other interns, graduate students, postdoctoral fellows, and faculty members to gain experience in contemporary alcohol research topics and methods. A primary goal of the program is to provide interns with "hands-on" research experiences that serves as an introduction to graduate training in alcohol and addiction research. Research projects and work environments vary across labs, with some labs conducting ongoing projects collecting behavioral and psychophysiological data with human subjects, to laboratory studies involving the administration of alcohol, to computer labs that focus on secondary data analysis or computer simulation.

DESCRIPTION OF LABS:

Social Cognitive and Addiction Neuroscience Lab (Bruce D. Bartholow). The overall aim of projects in Dr. Bartholow's lab is to understand processes that increase risk for alcohol use disorder. This is achieved mainly in two types of studies: (1) examining acute effects of alcohol on brain and behavioral responses related to self-regulation, and (2) studying individual differences in subjective and neurophysiological responses to alcohol and alcohol-related cues. Interns will learn generally about the conduct of psychological and psychophysiological research to investigate effects of alcohol on brain and behavioral responses and to examine alcohol cue-reactivity. Interns will learn about experimental laboratory techniques used to test cognitive processes, and will learn about the importance of experimental control. Interns who show considerable promise and initiative will be invited to assist with conference presentations pertaining to project data. http://scanlab.missouri.edu/

Behavioral Decision Making Lab (Clint Davis-Stober). Dr. Davis-Stober's lab conducts research within the emerging field of behavioral decision-making. Work in this lab examines how individuals integrate multiple pieces of information when making a decision, the rationality of various decision strategies, and the performance of various decision rules in the context of the linear model. In collaboration with Dr. McCarthy's lab, Dr. Davis-Stober's lab has several ongoing projects focused on addiction-relevant decision making: (1) the development of new mathematical models of how individuals choose whether or not to drive under alcohol intoxication, (2) modeling risky sexual decision making, and (3) investigating fundamental changes in choice behavior under alcohol intoxication. Interns working with Dr. Davis-Stober will gain training in mathematical modeling and statistical analyses. In addition, trainees will be exposed to the latest research in behavioral economics and choice modeling as it pertains to addiction research. https://www.davis-stober.com/

Health Neuroscience Center (Brett Froeliger). The focus of the HNC is on identifying biohehavioral mechanisms that maintain drug-use behaviors and developing new treatments for substance use disorders. We combine fMRI, lab-based assessments and mHealth to evaluate the potential benefit of novel pharmacotherapies, behavioral interventions and non-invasive neural stimulation for treating addiction pathophysiology. We approach this work by collaborating with preclinical researchers and clinical trialists, with the goal of the HNC to provide the translational bridge between fundamental neuroscience and treatment outcomes. Interns will

learn about theory and techniques for translating between neuroscience, cognitive and clinical models of addiction. https://www.healthneurosciencecenter.com/

Gene-Brain-Behavior Relations Lab (Ian R. Gizer). Research in the lab focuses on genetic contributions to the development of externalizing spectrum disorders, including substance use disorders. Current projects in the lab aim to identify genetic variants associated with alcohol dependence and related behavioral traits (e.g., impulsivity) and use molecular genetic data to understand the relations between such traits. Interns will learn about current molecular genetics methods and how such data can be used to inform our understanding of the biological mechanisms that contribute to the etiology of addictive behaviors. Using existing datasets, interns will gain hands-on experience formulating and conducting molecular genetic analyses beginning with preliminary quality control analyses to conducting tests of genetic association between individual variants and biological pathways and alcohol and other substance use disorders.

Addiction Science Dissemination and Implementation Lab (Ashley Helle). This lab applies dissemination and implementation (D&I) science to understanding and improving the adoption and sustainment of evidence-based interventions for alcohol and substance use. The primary project is centered around understanding how college prevention experts select and adopt alcohol prevention strategies for their campuses, with the ultimate goal of developing a support program to enhance their efforts. Other projects focus on improving access and reducing barriers for addiction prevention, treatment, and information among at-risk groups (e.g., college students, individuals with co-occurring mental health concerns). Interns working with Dr. Helle will learn about evidence-based approaches to alcohol intervention and will have the opportunity to craft a research project using either provider and/or student data, depending on interests and availability. Interns can gain experience with mixed-methods data analysis, scientific writing, manuscript preparation, and collaborating with stakeholders (e.g., student affairs groups, prevention specialists in the field). https://hellea.mufaculty.umsystem.edu/home

Regulation of Emotion, Addiction, and Conflict Trajectories Lab (Sean Lane). Research in the REACT lab focuses on the development of quantitative models of personality and psychopathology at both the diagnostic and experiential levels. Many projects focus on the role of emotion (dys)regulation in the development and maintenance of substance use, interpersonal relationships, and well-being. Mechanisms of interest include, impulsivity, craving, differentiation, coping, as well as time perception. We leverage epidemiological (surveys, interviews), experimental (laboratory), and ecological (smartphone) data to connect and understand these processes across time scales. Interns will gain experience in the design, implementation, management, and analysis of such data structures. Depending on individual interests, interns can participate in lab activities that span assisting in study material development using novel technologies to results dissemination from simulation, dynamic systems, and machine learning analyses. https://reactlab.wixsite.com/reactlab

Alcohol Cognitions Lab (Denis McCarthy). Research in the lab focuses on the acute effects of alcohol on decision making, impulsivity, working memory, and perceptions of problem behaviors associated with alcohol use (e.g., driving after drinking, risky sexual behavior). Interns will get experience with the procedures of alcohol administration in humans. In addition, interns will learn the logistics of decision making tasks, behavioral task measures of impulsivity, and the assessment of attitudes and cognitions about substance use. Finally, an ongoing collaboration project between this lab and the Personality and Emotion Laboratory (Trull) will combine laboratory and EMA methods for examining driving after drinking – interns can also be exposed to basics of EMA methods as part of this joint project. http://faculty.missouri.edu/mccarthydm/

Health Intervention and Treatment Research Lab (Mary Beth Miller). The Health Intervention and Treatment Research Lab conducts clinical research to enhance our understanding of how and why people change their health behaviors. Our research focuses primarily on addictive behaviors (e.g., alcohol and other drug use) but also targets other health behaviors, such as sleep and nutrition. Our goal is to improve the effectiveness and efficiency of prevention and treatment among high-risk populations (e.g., young adults, Veterans). We are particularly interested in electronic interventions that can be widely disseminated to increase the reach of public health promotion and prevention efforts. We collaborate closely with Dr. Christina McCrae's MizZzou Sleep Research Lab and have several ongoing projects examining change in sleep as a mechanism of change in alcohol-related problems. Interns will learn the logistics of randomized controlled trials and gain experience with daily, cognitive, and physiological assessments.
https://medicine.missouri.edu/centers-institutes-labs/hit-research-lab

Cost Effective Sampling for Social Network Data to Minimize Measurement Error (Douglas Steinley). Research in this lab focuses on key methodological challenges associated with social network analysis, especially as applied to alcohol use. These include (a) the assessment of the sensitivity of network statistics and model parameters to various types of missing data under different sampling schemes, (b) develops the first notions of effect sizes and power analysis for social network methodology, and (c) cost-effective sampling schemes. The methodology involves computer simulations coupled with advanced combinatorial data analytic approaches. Depending upon the qualifications and interests of the intern, he or she could be involved in conducting computer simulations (primarily on a MATLAB platform) or implementing recommendations that stem from the simulations on available social network data sets.

Personality and Emotion Laboratory (Tim Trull). The overall aim of ongoing work in this lab involves a series of NIH-funded projects assessing alcohol use, cannabis use, and self-harm as emotion regulation strategies among individuals high in affective instability/emotion dysregulation. Studies also assess craving, pain, mood, impulsivity, and dysregulated behavior in daily life. Interns will gain valuable experience interacting with self-report, physiological, and behavioral data collected in daily life from clinical participants. Participating interns can expect to learn more about the data collection process of a research study and ethical treatment of human subjects. Further, interns will become familiar with statistical packages such as SAS, SPSS, and MPlus, as well as smartphone and wireless sensor technology.
https://sites.google.com/view/personalityandemotionlab/