National Institute on Drug Abuse
Summer Research Internship Program

2018
Program:
The NIDA Summer Research Internship Program supports all students with a focus on increasing underrepresented populations in drug abuse research. Through this program, undergraduates age 18 and older are introduced to the field of drug abuse and addiction research by participating in research internships with NIDA's distinguished scientists at universities across the United States. Students work with leading scientists for eight weeks during the summer. The internship may include laboratory experiments, data collection, data analysis, formal courses, participation in lab meetings, patient interviews, manuscript preparation, library research, and literature reviews. In addition, it is expected that each intern will deliver a formal presentation on his/her research project at the end of the internship.

The NIDA Summer Research Internship Program is in its 22nd year. Since the program's inception in 1997, more than 1160 students have gained experience in drug abuse and addiction research.

Eligibility:
This program provides summer research internships for all undergraduate students 18 years and older, with a focus on recruiting students underrepresented in the biomedical, behavioral, and clinical sciences (American Indian/Alaska Native, Black/African American, Hispanic/Latino, and Native Hawaiian/Pacific Islander). Graduating 2018 college seniors are eligible to apply.

Applicants must be at least 18 years old by May 31, 2018 and must be U.S. citizens or permanent residents of the United States (No Exceptions).

Individuals who have already participated in the NIDA Summer Research Internship Program are no longer eligible to apply.

Scope of Support:
- Stipends in the amount of $12.00 per hour for a maximum stipend of $3,840 for eight weeks,
- Up to $2,500 for housing assistance,
- Up to $500 to be used for air or local travel.

Housing Accommodations:

There are two different housing options for the research sites included in the NIDA Summer Research Internship program. For both options, the housing is funded by NIDA and will be reimbursed to the intern by the host research institution. For research sites with the “Campus Housing Available” option, the intern will be able to stay in on-campus housing which is coordinated through the research site, institution, and intern. For research sites with the “Housing Subsidized” option, housing will still be funded by NIDA, however for these research sites, the intern will be responsible for securing their own housing accommodations. Some research sites have local housing resource guides that they share with interns.

Application Procedures:
To apply for this program, fill in all sections of the application form. Prior to making research site selections, review the research projects and locations listed in the online brochure. After
reviewing the descriptions, indicate on the application the three sites that best match your research interests. **All efforts will be made to match applicants to one of their top three choices.**

Application components include:

- a completed application form
- current transcripts (unofficial transcripts are acceptable)
- two letters of recommendation (should be on letterhead)

*** **Your references will be contacted only after the application is submitted.** You may modify, save, and submit your application as often as needed up to the deadline and the application will be automatically updated each time.

All application materials must be submitted by **Monday, February 12, 2018.**

Application Review and Selection:
Interns are selected according to the following criteria:

- Professional/Career goals
- Research interests
- Academic Achievement
- Letters of recommendation
- Program priorities

For additional information see the [FAQs](#).

Contacts:
Feel free to contact Julie Huffman, huffmanj@mail.nih.gov, phone 301-443-9798; or Albert Avila, Ph.D., aavila@nida.nih.gov.
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Arizona

Investigator: Cassandra Gipson-Reichardt, Ph.D.
Institution: Arizona State University
            Tempe, AZ
Project Title: Contributions of Glial Glutamate Transport and NMDA Receptors in Nicotine Relapse
Research: Behavioral Research
Research Area: Behavioral Neuroscience, Addiction
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Must maintain at least a 3.0 GPA.

Project Description: This goal of this project is to investigate nicotine-induced changes in synaptic strength, with a focus on alterations in the glial glutamate transporter and the GluN2B subunit of the glutamate NMDA receptor. This grant has the potential to reveal novel neurobiological mechanisms of nicotine addiction, and could contribute to the development of novel therapeutic options aimed at reversing nicotine-induced neurobiological alterations.
Arizona

Investigator: Rajesh Khanna, Ph.D.
Institution: University of Arizona
Tucson, AZ
Project Title: CRMP2, Nav1.7 sodium channel, and chronic pain
Research: Basic Research
Research Area: Ion channels; Pain; Non-Addictive
Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: A curious mind and motivation. A basic understanding of cell biology and courses in neurosciences would be an asset but not a requirement.

Program Description: Chronic pain represents a critical unmet medical need that afflicts over one hundred million Americans with an economic cost over $500 billion. Current available therapies lack robust efficacy, carry significant abuse potential, and/or suffer from low tolerability and safety. Targeting voltage gated sodium channel Nav1.7, a protein linked to a broad range of pain conditions, has emerged as a strategy for development of pain therapeutics. We have identified compounds that selectively blunt the activity of this channel via a unique mechanism. The focus of the studies in this proposal is to provide rigorous validation of this novel mechanism as a means to achieve selective inhibition of Nav1.7. The summer internship will involve cell biological, imaging, and biochemical evaluation of the allosteric modulation of the NaV1.7 channel.
Arizona

Investigator: Janet Neisewander, Ph.D.
Institution: Arizona State University
Tempe, AZ
Project Title: Neural mechanisms of drug seeking
Research: Basic Research
Research Area: Cocaine; Nicotine; Serotonin; Gene Expression; Stress
Earliest Start Date: 5/18/2018
Housing: Campus

Student Qualifications: Required: Desire to study behavioral neuroscience using animal models that allow one to examine molecular mechanisms involved in behavior. All research projects involve the use of rodents (mice or rats). Motivation to learn and work hard on the research project.
Desired: Some science background (e.g., a high school level course in biology, psychology, and/or chemistry).

Program Description: Cocaine and other psychostimulants alter dopamine and serotonin systems, which are involved in motivation, mood, and coping with stress. Research projects in the lab compare anatomical and gene expression changes in dopamine and serotonin systems response to cocaine self-administration in rats that live in enriched housing conditions versus in isolation. This information leads to hypotheses regarding neural the mechanisms and pathways involved in motivation to seek cocaine. Other project in the lab test the hypotheses by measuring cocaine seeking behavior in rats after manipulating specific serotonin signaling pathways within neurons that are part of the brain addiction circuits.
Arkansas

Investigator: Forrest Payne, Ph.D.
Institution: SFC Fluidics, Inc
Fayetteville, AR
Project Title: Development of an Implantable On-Demand Drug Delivery Device for Behavioral Studies in Small Animals
Research: Behavioral Research
Research Area: none listed
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: The ideal intern will be studying mechanical or biomedical engineering. He/She will have experience with CAD software as well as good laboratory skills including experimental design and setup and data collection, evaluation, and reporting. The intern should have clear communication skills to be able to write reports and presentations to convey ideas and test results to technical and non-technical co-workers, potential end-users, and supervisors.

Program Description: During the summer of 2018, SFC Fluidics will be in the process of designing, engineering and testing up to three configurations of an implantable min-ePump for remote-controlled and tetherless delivery of drugs to small animal models (esp. rats). This novel pumping system will enable the development of improved small animal behavior models, especially those that focus on group housing and behavior. Depending on the progress of product development and on the interest/abilities of the intern, specific tasks could include:

- Packaging and testing of components to determine optimal bundling configurations within each pod design.
- Working with end users, manufacturing teams and assembly teams to realize the best design in terms of functionality, ease-of-use, animal comfort, and cost of manufacturing.
- Design of mounting hardware as well as electrical and fluidic connections.
- Testing of final assembled device for fill/refill ability of the drug reservoir, flush port access and usability, battery recharging specifications, and/or final product delivery specifications.
- Determination of accuracy and precision of dosing for one or more pod configurations.
California

<table>
<thead>
<tr>
<th>Investigator:</th>
<th>Christie Fowler, PhD</th>
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<tbody>
<tr>
<td>Institution:</td>
<td>University of California, Irvine Irvine, CA</td>
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<tr>
<td>Project Title:</td>
<td>Circulating miRNAs and Epigenetic Regulation in Nicotine Addiction</td>
</tr>
<tr>
<td>Research:</td>
<td>Basic Research</td>
</tr>
<tr>
<td>Research Area:</td>
<td>Drug Addiction; Nicotine; Self-Administration; Extracellular Vesicles; Exosomes; RNA; Epigenetics; Genetics</td>
</tr>
<tr>
<td>Earliest Start Date:</td>
<td>5/1/2018</td>
</tr>
<tr>
<td>Housing:</td>
<td>Subsidized</td>
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</tbody>
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**Student Qualifications:** Background in biology, neuroscience or related field. Prior experience in handling rats or mice (preferred, not required). Must be willing to work with animals, cells in culture, and tissue samples. Career interests to pursue graduate studies in drug addiction and/or neuroscience.

**Program Description:** The Fowler lab is focused on discovering the genetic, epigenetic and molecular mechanisms underlying tobacco/nicotine dependence. A current focus of the lab is to elucidate the factors localized in extracellular vesicles, or exosomes, which are found circulating in biofluids of the brain and body. Cerebrospinal fluid-derived extracellular microvesicles have been recently identified to contain a variety of signaling factors, such including multiple RNA species. For this research project, the student will be involved in rodent studies to determine the uptake of extracellular vesicles from the cerebrospinal fluid into neurons of the brain. The investigations will involve multiple approaches to isolate, label and inject extracellular microvesicles, as well as examination of the impact on neuronal signaling mechanisms.
California

Investigator: Theodore Friedman, M.D., Ph.D.
Institution: Charles R. Drew University of Medicine & Science
Los Angeles, CA
Project Title: CDU Diversity-promoting Institutions Drug Abuse Research Development Program
Research: Basic Research
Research Area: Smoking; Nicotine; Insulin Resistance; Obesity; Diabetes;
Drug Addiction; Fatty Liver Disease; Electronic Cigarettes
Earliest Start Date: 5/16/2018
Housing: Campus

Student Qualifications: The following skills are preferred:
- Molecular Biology skills
- Animal handling skills
- Computer skills (excel, word, and PowerPoint)

For epidemiology and literature review projects, only computer skills are needed.

Program Description: The Charles R. Drew University is a site of the DIDARP (Diversity-promoting Institutions Drug Abuse Research Development Program. Dr. Theodore Friedman is the Program Director. Most of our research is on the endocrine effects of drugs of abuse. We are intrigued by the clinical condition that smokers are lean, yet have more cardiovascular disease, insulin resistance and diabetes. We are using mouse models to understand this paradox and have found that nicotine plus a high fat diet leads to weight loss and reduced abdominal fat, yet ectopic fat depositions in liver and muscle. We are also looking at how nicotine plus soft drinks leads to hepatic steatosis. We are have recently found that electronic cigarettes lead to atherosclerosis, heart failure and fatty liver disease in mice. Additional opportunities exist for clinical projects, literature review projects and epidemiology projects related to drug addiction.

All experiments are well suited for student involvement and will introduce them to major techniques in substance abuse research. Housing is available at nearby California State University-Dominguez Hills and USC students will be given the opportunity to present at our annual Drew Substance Abuse Research Day.

Come enjoy a great summer in sunny Los Angeles, learn about drug addiction research and be part of a team that is advancing knowledge about nicotine and electronic cigarettes.
California

Investigator: Oliver George, Ph.D.
Institution: The Scripps Research Institute
La Jolla, CA
Project Title: Identification of Genetic Variants that Contribute to Compulsive Cocaine Intake in Rats
Research: Basic Research
Research Area: Cocaine, Addiction, Dependence, Stress, Reward
Earliest Start Date: 5/14/2018
Housing: Subsidized

Student Qualifications: The research program will involve animal handling as well as brain sample processing. Ability to work with animals (rats, mice), and not being afraid to handle them is required. Proficient with excel and general computer use necessary.

Program Description: The primary goal of this proposal is to identify gene variants that are associated with greater vulnerability to compulsive oxycodone use, tolerance to the analgesic effects of oxycodone, development of withdrawal-induced hyperalgesia, and sensitivity to FDA-approved medications by performing a GWAS in N/NIH heterogeneous stock rats. We will use the most relevant animal model of oxycodone use disorder (i.e., escalation of intravenous oxycodone self-administration) and highly standardized measures of compulsive oxycodone self-administration combined with longitudinal assessments of pain thresholds. This project is likely to have a sustained and powerful impact on the field because it will (1) characterize the transition from controlled to compulsive oxycodone use and its comorbidity with hyperalgesia in male and female outbred rats, (2) identify genes associated with compulsive oxycodone use, the preclinical efficacy of current medication (e.g., buprenorphine), and the analgesic/hyperalgesic effects of chronic oxycodone use, and (3) facilitate follow-up studies by creating a repository that contains brain and blood with a variety of tissue preservation protocols that will facilitate follow-up and replicative studies by allowing the generation of induced pluripotent stem cells and neuroanatomical, molecular, biochemical, and pharmacological studies on behaviorally/genetically characterized animals.
California

Investigator: Su Guo, Ph.D.
Institution: University of California, San Francisco
San Francisco, CA
Project Title: Developing tools to study hypothalamic function
Research: Basic Research
Research Area: Neural Circuitry; Stress; Dopamine; CRF; Tool Development; Drug Abuse; Zebrafish
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Applicants should be currently enrolled in an undergraduate institution, preferably majoring in neuroscience. S/he should have prior knowledge or training in molecular biology, genetics, or microscopy. The research will require students to work with animals (zebrafish).

Program Description: The applicant will work with graduate students or postdocs in the lab and employ molecular genetics and imaging technologies to understand cellular and molecular basis of drug- or stress-induced behaviors.
California

Investigator: Maria Cecilia Marcondes, Ph.D.
Institution: San Diego Biomedical Research Institute
San Diego, CA
Project Title: Methamphetamine and HIV Interactions in the Regulation of Glial Activation
Research: Basic Research
Research Area: Neuro-immunology of HIV and drug abuse
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Some knowledge on computers, some knowledge on cell cultures, and a little theoretical knowledge of basic immunology. The research will be on human cell lines.

Program Description: Methamphetamine (Meth) abusers and HIV-positive populations highly overlap, and in the presence of both factors neurological disorders are severed. We are examining different modes of action by which Methamphetamine abuse affects inflammatory outcomes in the brain, using in vitro systems. We have found that Meth can trigger different inflammatory genes by acting in different signal pathways, triggered either directly, through reactive oxygen species, or through dopamine. In addition, the interaction between Meth and HIV Tat, can further affect inflammatory outcome in the brain through yet other signaling pathways. We are examining the different modes of action of Meth and HIV Tat that modify the inflammatory status of the Central Nervous System, particularly as a viral reservoir. The student will learn bio-informatics and systems biology tools to identify target clusters and pathways under different experimental conditions, and learn validation techniques.
California

Investigator: Danielle Ramo, Ph.D.
Institution: University of California, San Francisco
San Francisco, CA
Project Title: Using Facebook to address smoking and drinking in young adults
Research: Clinical Research
Research Area: Alcohol consumption; Smoking, Addiction; Social Media; Facebook; Behavioral Study; Binge Drinking; Dependence; Design; Clinical Trial; Young Adults; Focus group; Usability Testing; Tobacco; Risk Behaviors
Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: The intern would be working with human participants on social media and will never meet them in person.

- High school degree or BA/BS with a major in psychology or related science
- Highly proficient working with MS Word, Excel, and PowerPoint
- Professional skills including time management, superior organization, ability to meet multiple deadlines, be resourceful
- Strong oral/written communication, interpersonal and organizational skills
- Previous research experience is not required

Program Description: The intern will be working on a project that focuses on using Facebook to address smoking and heavy drinking in young adults. Phase I has developed Tobacco Status Project (TSP)+ALC intervention posts based on focus groups with young adults who smoke and drink heavily, Facebook quit smoking intervention developed in our lab, US Clinical Practice Guidelines for smoking cessation, and National Institute on Alcohol Abuse and Alcoholism (NIAAA) guidelines for changing alcohol use. Phase II, beginning Winter 2017 will evaluate the feasibility and initial efficacy compared to TSP, in a randomized trial with 160 US young adults recruited online. Young adults who smoke and have heavy episodic drinking (HED) will be randomized to receive TSP or TSP+ALC. Both interventions will assign participants to a private Facebook group tailored to their readiness to quit tobacco and deliver a 90-day intervention including Facebook postings and weekly "The Dr. Is In" sessions. All participants will be offered a 2-week introductory supply of nicotine patch. Participants will complete baseline, 3, 6, and 12 months follow-up assessments online. The primary outcome will be biochemically-verified 7-day point prevalence abstinence at each time point. Secondary outcomes include days of HED, dependence symptoms, readiness to quit, and thoughts about abstinence for smoking and HED.
California

Investigator: James Sorensen, Ph.D.
Institution: University of California, San Francisco
San Francisco, CA
Project Title: Western States Node of the National Drug Abuse Treatment Clinical Trials Network
Research: Clinical Research
Research Area: Drug Abuse Prevention; Drug Abuse Treatment Services;
Clinical Trials; HIV; Hepatitis C (HCV)
Earliest Start Date: 5/30/2018
Housing: Campus

Student Qualifications: We are seeking undergraduate students with declared majors in psychology, sociology, or cognitive science. Interns will have exposure to human subjects in clinical settings. Preferred student research interests include substance use, nicotine dependence, HIV/AIDS, HCV and organizational behavior. Candidates who have completed an introductory statistics course are preferred. Prior research experience is not required. Students from underrepresented populations are highly encouraged to apply.

Program Description: Dr. James L Sorensen is co-Director, with Dr. Dennis McCarty, of the Western States (WS) Node of the National Drug Abuse Treatment Clinical Trials Network (CTN). The WS Node promotes evidence-based drug abuse prevention and treatment services through continued participation in the CTN. The Node 1) designs and implements clinical trials of evidence-based treatments of addiction through rapid recruitment of diverse study participants in partnership with NIDA and the CTN, 2) generates peer-reviewed publications in collaboration with treatment providers and other nodes, and 3) uses the CTN as a platform for training, dissemination, and research applications.
Investigator: Susan Tapert, Ph.D.
Institution: University of California, San Diego
San Diego, CA
Project Title: ABCD-USA Consortium: Research Project
Research: Clinical Research
Research Area: Adolescence; Substance Use; Neuroimaging; Epidemiology
Earliest Start Date: 7/1/2018
Housing: Campus

Student Qualifications: Ideal candidates would have interests in adolescence, neuroimaging, and the effects of substance use on development. Candidates may be enrolled in majors such as Psychology, Human Development, Cognitive Science, or similar courses of study. Candidates might be interested in careers in research, mental health, advocacy, or medicine, and should be detail oriented, proactive, and independent. Prior research experience is not required.

Program Description: The Adolescent Brain Cognitive Development (ABCD) Study is the largest long-term study of brain development and child health in the United States. The ABCD Research Consortium consists of a Coordinating Center, a Data Analysis and Informatics Center, and 21 research sites across the country, which will invite approximately 10,000 children ages 9-10 to join the study. Researchers will track their biological and behavioral development through adolescence into young adulthood.

Adolescence is a time of dramatic physical, emotional, and intellectual growth. During the past decade, neuroimaging techniques—which allow researchers to look at the brain in a non-invasive way—have shown that it is also a period of dramatic changes in brain structure and function. Adolescence is known as a time of burgeoning independence, when many risk-taking behaviors emerge. Teens sometimes experiment with cigarettes, alcohol, and marijuana—precisely when the developing brain is most vulnerable to the short- and long-term effects of drugs.

The summer internship will offer a student the opportunity to view and participate in participant visits, gain an understanding of the operation of a large research study, and depending upon level of skill and interest, examine data around substance use in adolescence alongside other neurocognitive measures. Candidates may also help project staff with families and adolescents during study assessments, such as setting up for research appointments.
Investigator: Amy Wachholtz, Ph.D.
Institution: University of Colorado Denver
Denver, CO
Project Title: Advancing STOP: Self-regulation Therapy for Opioid Addiction and Pain
Research: Clinical Research
Research Area: Opioid Addiction; Chronic Pain; Psychophysiology; Therapy Treatment Development
Earliest Start Date: 6/3/2018
Housing: Campus

Student Qualifications: The research project will require students to work with human participants. Students should have basic statistics experience (familiarity in working with SPSS) and a basic understanding of psychology research methods. An interest in experimental, health, or clinical psychology is a plus.

Program Description: The intern will be assisting with a pilot randomized controlled trial examining a new therapy protocol in the treatment of opioid use disorder in conjunction with chronic pain in adults ages 18-65. The study consists of a rolling 12-week therapy group administered by Master's level clinicians. Mini-psychophysiological assessments will occur weekly. Full psychological and physiological measures will be taken pre- and post-treatment and at a 1-month follow-up to assess the efficacy of therapy. The undergraduate intern will be involved in study recruitment and screening of potential participants, weekly and pre/post administration of assessment measures to participants, developing training materials, data input, basic data analysis, and additional administrative duties.
Connecticut

Investigator: Frederick Altice, M.D., M.A.
Institution: Yale University
New Haven, CT
Project Title: Prison Interventions and HIV Prevention Collaboration
Research: Epidemiology Research
Research Area: Opioid Agonist Therapy; Implementation Science; HIV Prevention; HIV Treatment; Methadone; Buprenorphine; Prisoners; Attitudes; Health Beliefs; Operations Research; Qualitative Research; People who Inject Drugs; Criminal Justice System

Earliest Start Date: 5/15/2018
Housing: Campus

Student Qualifications: We conduct clinical behavioral research. A broad range of data analyses are available to the student, depending on his/her skill set. We have extensive qualitative data, quantitative survey data and mixed methods options. Basic understanding of epidemiologic research would be an asset. No work with animals or tissue samples is needed. Ideally should have some experience with QUALITATIVE METHODS and SOFTWARE (nVIVO, dedoose, other)-OR- QUANTITATIVE METHODS and SOFTWARE (STATA, SAS, SPSS, or R)

Program Description: HIV incidence and mortality decreased globally, yet increased markedly in the Commonwealth of Independent States (CIS) of Eastern Europe and Central Asia. Consequently, HIV epidemics remain volatile, fueled primarily by people who inject drugs (PWIDs) with opioid use disorders (OUDs). HIV prevalence in PWIDs in the CIS is high (21.3%-49.8%), and PWIDs account for >70% of cumulative and 56% of new HIV infections. Drug policies favoring incarceration over community treatment regionally have resulted in high incarceration rates of people with psychiatric and substance use disorders (SUD) and people at risk for or living with HIV (PLH). Prisoners often engage in risky HIV behaviors both within prison and post-release. Research confirms that scaling up and combining medically assisted therapies (MAT) and antiretroviral therapy (ART) is the most effective HIV prevention strategy in CIS countries. Despite unambiguous evidence supporting MAT, <2% of PWIDs in Ukraine and Central Asia are receiving MAT, especially in prisons. Using an implementation science framework the investigators introduce or expand MAT offered to prisoners with OUDs and post release. The 2018 Summer Intern would work with investigators in the US and in Ukraine and CIS countries conducting quantitative and qualitative data analysis to assess organizational and client-level factors related to prisoners’ utilization of MAT, linkage to community treatment, and retention post-release.
Investigator: Jinbo Bi, Ph.D.
Institution: University of Connecticut
Storrs, CT.
Project Title: Quantitative methods to subtype drug dependence and detect novel genetic variants
Research: Epidemiology Research
Research Area: Ethnographic Research; Qualitative Research; Drug Patterns; Drug Transitions; Heroin; Prescription Drugs; Fentanyl
Earliest Start Date: 5/7/2018
Housing: Campus

Student Qualifications: Candidates should have experience with analytics and data analysis. Preferred education is a BS or MS degree in Computer Science or Mathematics, or Statistics. Candidates should have reasonable computer programming skills in python, or R, or C++. It will be a plus if the candidate has prior exposure to machine learning.

Program Description: The project is a machine learning and big data analysis project. The intern is expected to use data from >11,000 identically assessed subjects aggregated from family-based and case-control genetic studies of cocaine, opioid and alcohol dependence to identify clinical subtypes that are optimized with respect to heritability. Besides this discovery dataset, a number of datasets downloaded from NIH dbGap collected from genome-wide association studies will be used as validation or replication datasets. All subjects were assessed with reliable demographic, medical, substance use, and substance-related measures, and DSM diagnoses of all major substance use and psychiatric disorders. The intern will perform analyses using a family of machine learning methods developed during the PI R01 project for heritable component analysis, subject clustering jointly on the basis of clinical symptoms and genotypes, and imputation of missing diagnostic criteria from genotypes. These analyses aim to identify alcohol use, or opioid use, or cocaine use subtypes which will help enhance diagnostic classification of substance use disorders and detect novel genetic variants underlying the risk to the disorders.
Investigator: Linda Mayes, M.D.
Institution: Yale University
New Haven, CT
Project Title: Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers
Research: Clinical Research
Research Area: Parenting, Addiction, Oxytocin, fMRI
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: None listed

Program Description: This research project will examine whether the administration of the hormone oxytocin influences maternal brain responding in addiction. In this study, functional magnetic resonance imaging (fMRI) will be used to examine the brain response of mothers as they view photographs of their own and unfamiliar infant faces. Mothers are either substance-using or non-substance-using, and across two lab visits, they will complete the fMRI scan following either a placebo or oxytocin administration. Mothers will also complete interactions with their infants to provide a behavioral measure to examine alongside the neuroimaging data. Additionally, maternal attachment classification will be assessed.
Connecticut

Investigator: Jaimie P. Meyer, M.D.
Institution: Yale University
New Haven, CT
Project Title: Prisons, Drug Injection and the HIV Risk Environment in Kyrgyzstan
Research: Clinical Research
Research Area: HIV; Women; Criminal Justice; Substance Abuse
Earliest Start Date: 7/1/2018
Housing: Subsidized

Student Qualifications: Previous research experience is not required. Qualified interns should be interested in this area of research, highly motivated independent thinkers who are able to work as part of a team. Some experience with quantitative data management or analysis is preferred but not required.

Program Description: The PI is conducting several ongoing projects related to HIV prevention for justice- and drug-involved women. These include: 1) a longitudinal qualitative study of the HIV risk environment among prisoners in Kyrgyzstan; 2) a clinical trial of a behavioral HIV prevention intervention for women on probation; 3) a PrEP demonstration project for justice-involved women and their risk networks; and 4) a clinical trial of a PrEP decision aid for women in drug treatment programs. The summer intern will be involved in collecting and managing and analyzing data as part of the research team depending on their specific interests and skills.
District of Columbia

Investigator: Joshua Corbin, Ph.D.
Institution: Children’s National Medical Center
Washington, DC
Project Title: Development of the Basal Telencephalic Limbic System
Research: Basic Research
Research Area: Developmental Neuroscience and Neural Circuit Function
Earliest Start Date: 5/14/2018
Housing: Subsidized

Student Qualifications: Potential career research interest and/or major in biology as well as a strong desire to learn and participate in team science. Previous research experience not necessary, most important qualifications are a positive attitude and strong work ethic. Students may work with animal tissue, but typically not with live animals.

Project Qualifications: Research in the Corbin lab is directed toward understanding the genetic mechanisms that govern the embryonic development of the limbic system of the brain. The limbic system of the brain regulates behaviors with emotional or social content. Altered development of this system is a hallmark feature of a variety of human disorders such as autism and addictive behaviors. Using the mouse as a model, projects in the lab are focused on a variety of questions regarding limbic system development, function and dysfunction, including as examples, 1) assessment of gene alterations in genetically engineered mice lacking genes critical for brain development, 2) tracing and visualizing of neuronal connections between different brain limbic system structures and/or 3) assessment of limbic-system behaviors in genetically altered mice.
Investigator: Laura Bohn, Ph.D.
Institution: The Scripps Research Institute
Jupiter, FL
Project Title: Regulation of Opioid-Induced Biological Responses by Beta-Arrestins
Research: Drug Development Research
Research Area: Opioid Receptors; Morphine; Reward; Reinforcement, GPCR Pharmacology; Ligand Bias; Drug Discovery; Mouse Models; Biochemistry; Cell Biology; Animal Behavior
Earliest Start Date: 5/25/2018
Housing: Campus

Student Qualifications: It is preferential that the student has research experience; either wet bench biochemical or animal behavior experience. Depending on their background, we could find a suitable position for them in our wide-ranging approaches to drug development. Analytical skills and organized record keeping are a must. A background in coursework on Pharmacology or Biochemistry is highly desired.

Program Description: We have developed mu opioid receptor agonists that bias MOR signaling toward G protein pathways over beta-arrestin recruitment. Based on extensive work using Barrestin2-KO mice, we have hypothesized that activation of MOR without Barrestin2 recruitment will provide antinociception without side effects, including tolerance, constipation, respiratory suppression and physical dependence. We do not know whether the compounds will be more or less rewarding. These studies are beginning using mouse conditioned place preference (CPP) assays. The student would have the opportunity to take part in an active drug discovery program. We are a small efficient group of researchers (6 on the team) and the student would have the opportunity to experience first-hand how we evaluate our compounds in vitro and in vivo; they would learn how we use our findings to drive lead molecule identification and direct further chemical development. We are also working collaboratively to understand how these ligands effect the structure of the receptor. In the lab, we are making mutant receptors and determining effects on signaling bias.
Investigator: Linda B. Cottler, Ph.D., M.P.H.
Institution: University of Florida
Gainesville, FL
Project Title: ABCD-USA Consortium: Research Project
Research: Epidemiology Research
Research Area: Adolescent Substance Use; Brain Development;
Epidemiology; Community-Based Research
Earliest Start Date: 5/7/2018
Housing: Subsidized

Student Qualifications: Seeking undergraduate students with interests in behavioral research, ethics, and/or the inclusion of underrepresented minorities in research. Students with a declared major in anthropology, psychology, sociology, social work, nursing, or other related fields are preferred. Summer students must be dedicated, reliable, curious, independent, solution-oriented, have good attention to detail, and be able to interact with members of the community.

Program Description: The Department of Epidemiology at the University of Florida has opportunities available for Summer Scholars interested in a challenging, yet rewarding, summer experience. The 2018 Summer Scholars will work on an ongoing NIDA research project, the Adolescent Brain Cognitive Development Study, which investigates the effects of adolescent substance use on brain development. Summer Scholars will gain experience and appreciation for the conduct of research by conducting literature reviews, participating in faculty/staff meetings, and assisting in both data collection and data analysis. Summer Scholars will learn about community outreach, including assisting with recruitment and screening of participants, and they will see firsthand the coordination of a landmark study that will enroll and follow up 400 adolescents from North Central Florida using multimodal brain imaging, cognitive and clinical assessments, and mobile monitoring. The interdisciplinary nature of this study will expose Summer Scholars to a team science approach and serve as an introduction to drug abuse research.
Florida

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<thead>
<tr>
<th><strong>Investigator:</strong></th>
<th>Madhavan Nair, Ph.D.</th>
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<tbody>
<tr>
<td><strong>Institution:</strong></td>
<td>Florida International University</td>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Nano-delivery of methandanamide across BBB to block cannabinoid induced effects in HIV-1 infection</td>
</tr>
<tr>
<td><strong>Research:</strong></td>
<td>Basic Research</td>
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<tr>
<td><strong>Research Area:</strong></td>
<td>Nanotechnology; HIV and Drug Abuse.</td>
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<tr>
<td><strong>Earliest Start Date:</strong></td>
<td>5/1/2018</td>
</tr>
<tr>
<td><strong>Housing:</strong></td>
<td>Subsidized</td>
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**Student Qualifications:** The prospect student will be an undergraduate student preferably majoring in physical or biological sciences with an expressed interest in pursuing a doctoral degree in basic or medical sciences. Students will be required to work with animals as well as tissue samples thus it is important to possess basic laboratory skills and knowledge. Students will be allowed to work only after getting appropriate training requested by the law and FIU, and will not work with HIV virus or infected tissues.

**Program Description:** The elimination of HIV reservoirs from the central nervous system (CNS) remains as a challenge, because viral latency in the brain and the inability of antiretroviral therapy (ART) to penetrate the tightly closed blood brain barrier (BBB). Studies have shown that there is a high prevalence of HIV infection among drug users. Practice of nanotechnology in medicine has shown to be an exciting prospect for the development of a novel drug delivery system across the BBB. Target specificity, drug delivery, drug release and bioavailability of delivered drug at the targeted site are of significance for the success of the therapy. Thus, from a drug delivery point of view, a fast and effective way of delivering and releasing the drugs from the carrier in the brain is needed in order to eradicate the latent HIV in the brain. The Magneto Electric Nano-Particles (MENP) is a subgroup of multiferroic materials possessing significant coupling ability of its magnetic and electric fields at body temperature. The movement of MENP can be remotely controlled for its effective penetration in the BBB by applying a weak DC current. The research project will consist in the development and evaluation of the transport, on-demand and efficacy of MENP bound to a latency breaking agent, ART and a drug antagonist across the BBB. Further, we will evaluate the in vivo efficacy of the in vitro developed nanocarrier in HIVE SCID mouse model along with a neurobehavioral modulation.
Investigator: Michael Eriksen, Sc.D.
Institution: Georgia State University
Atlanta, GA
Project Title: The Science of Decision Making: Connecting People to Policy
Research: Behavioral Research
Research Area: Tobacco use; Novel Tobacco Products; Consumer Behavior; Behavior Change; Marketing and Communication; Risk Perceptions; Decision Making; Economic Impact Assessment

Earliest Start Date: 5/15/2018
Housing: Campus

Student Qualifications: Outstanding undergraduate student in a relevant field including social sciences, economics, policy, psychology, public health, communication. Excellent written and oral communication skills and the ability to work individually as well as in teams are needed. The student should have an interest in research, public health and reducing the harm of tobacco use. No research with animals, humans or tissue samples. No prior research or experience in the field is required.

Program Description: Research Project 1: Vaping Marijuana
our research will be focusing on the demographics of who currently is using ENDS and/or blunts to deliver cannabis, how these patterns are changing, and if vaping of cannabis solutions is increasing the appeal among groups not otherwise susceptible to using blunts to smoke marijuana. Understanding how risk perceptions and misinformation about tobacco products, vaping, and marijuana are related to behavioral choices will be an emphasis of this research.

Research Project 2: Smoke-free Campuses
A large cohort of campuses throughout the US received grants from the American Cancer Society and CVS to support their tobacco-free campus policy initiatives. As part of their grants, these schools will be surveying their students to assess current tobacco product use and student opinions on tobacco product policies on their campus. The analyses will assess changes in current levels of tobacco product use and opinions of tobacco product policies among students before and after the campuses adopt 100% tobacco-free policies.
Georgia

Investigator: Anne Murphy, Ph.D.
Institution: Georgia State University
Atlanta, GA
Project Title: Impact of advanced age on opiate analgesia
Research: Basic Research
Research Area: Pain; Morphine; Sex Differences; Age; Inflammation
Earliest Start Date: 6/4/2018
Housing: Subsidized

Student Qualifications: The ideal candidate will have a strong background in neuroscience and some previous laboratory experience. As tissue has already been collected from adult and aged male and female rats, the fellow will not be required to work with live animals.

Program Description: Our research examines the impact of advanced age on the ability of morphine to alleviate pain in both male and female rats. We have previously shown that aged male rats require 2x the amount of morphine to produce comparable levels of pain relief as adults. Similar results have been reported clinically. Morphine inhibits pain via an action at the mu opioid receptor (MOR). Our studies specifically examine if there are age induced changes in MOR expression using receptor binding, in situ hybridization, autoradiography and qPCR, and if these changes are comparable between males and females. MOR is a G-protein coupled receptor and additional studies in the lab are examining the signaling cascade of MOR using the GTPgS assay.
Hawaii

Investigator: Scott K. Okamoto, Ph.D.
Institution: Hawaii Pacific University, Honolulu, HI
Project Title: The Development and Evaluation of the Ho'ouna Pono Drug Prevention Curriculum
Research: Behavioral Research
Research Area: Health Disparities; Rural; Hawaiian Youth; and Prevention
Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: This project requires students to work with humans only. It is appropriate for undergraduate students majoring in psychology, social work, public health, or another allied discipline. Students with knowledge and/or interest in rural, Native Hawaiian, and/or Pacific Islander youth populations are preferred. Although previous research experience is not required, students with strong attention to detail and communication skills are encouraged to apply.

Project Description: Building upon prior pre-prevention and pilot/feasibility prevention research, the primary goals of this project are to complete the development of the Ho'ouna Pono drug prevention curriculum and to evaluate the efficacy of the curriculum across all middle/intermediate schools on Hawai'i Island. Ho'ouna Pono is a culturally grounded drug prevention curriculum developed for rural Native Hawaiian youth. Summer Research with NIDA interns will assist in the collection, management, and/or analysis of data from public school students on Hawai'i Island. They may also assist in training teachers in the use of classroom lessons and accompanying video components in the curriculum. This project is appropriate for undergraduate students with interests in social/behavioral research in the area of drug prevention and health disparities. Students will collaborate with faculty and staff from multiple universities and may have opportunities to travel to Hawai'i Island for teacher training and/or data collection.
**Illinois**

<table>
<thead>
<tr>
<th>Investigator:</th>
<th>Stevan Hobfoll, Ph.D.</th>
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<tbody>
<tr>
<td>Institution:</td>
<td>Rush University Medical Center</td>
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<tr>
<td></td>
<td>Chicago, IL</td>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Development of Co-Morbid PTSD and Chronic Pain Among Inner-City Women</td>
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<td><strong>Research:</strong></td>
<td>Behavioral Research</td>
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<tr>
<td><strong>Research Area:</strong></td>
<td>Acute and chronic pain, traumatic stress, PTSD, psychosocial resilience and vulnerability factors</td>
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<td><strong>Earliest Start Date:</strong></td>
<td>6/4/2018</td>
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<tr>
<td><strong>Housing:</strong></td>
<td>Subsidized</td>
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**Student Qualifications:** Intern duties include recruitment, following study protocols, conducting interviews, and other study tasks. An ideal intern will be interested in psychology, public health, social or life sciences. The intern must be detail-oriented, organized, able to work on a research team, strong communication skills, and work with ethnically diverse women. If looking for excellent experience before graduate school, this is an ideal project for hands-on experience.

**Project Description:** The intern will join a team of researchers conducting a prospective study of inner-city women, examining how traumatic life experiences, PTSD, and quality and quantity of sleep relate to chronic physical pain. This 5-year research project (funded by NIH through 2020) will examine how resiliency and vulnerability factors moderate the impact of traumatic life experiences, violence, abuse, and quality and quantity of sleep on the emergence of chronic pain. The Trauma and Pain (TAP) Study includes supplemental funding to conduct a Sleep Study simultaneously for interested participants. Funding for the Sleep Study Add-on runs concurrently with the TAP Study, funded for 2-years. The goal is to examine the links between sleep problems and pain. For the supplement, additional measures were added to assess sleep duration, maintenance, timing, and variability plus data is collected from a watch that provides sleep information over a 10-day time frame. The overall goal of the TAP Study is to interview 600 women and of those women to invite 200 to participate in the Sleep Study.
Illinois

Investigator: Brian Mustanski, Ph.D.
Institution: Northwestern University
Chicago, IL
Project Title: Multilevel Influences on HIV and Substance Use in a YMSM Cohort
Research: Clinical Research
Research Area: HIV; Young Men Who Have Sex with Men; Multilevel Influence; Drug; Sex; and Social Networks; Dyadic Influences; Substance Use; Stis; Mental Health; Viral Set Point; Plasma HIV Sequencing
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Interest in social behavioral research, HIV, and at-risk populations such as young men who have sex with men. Good academic standing. Have interest in pursuing graduate education and research in psychology, public health, or related field. Conscientious and detail orientated. Must be able to coordinate housing on their own. Students will be required to work with human participants. Previous research experience is preferred.

Project Description: The IMPACT Program at Northwestern University conducts community-based research which improves the health and well-being of LGBT adolescents. The goal of the current project, RADAR, is to identify and understand connections among sexually transmitted infections (STIs) and HIV, drug/alcohol use, and romantic/sexual relationship patterns over time among young men who have sex with men (YMSM). This project is the first time that one study will look at drivers of new HIV infections in YMSM at multiple levels—the genetics of the virus, effects of medications, individual behavior, sexual partner and relationship characteristics, networks, and community-level factors. Project aims are to 1) Understand how co-occurring problems (syndemics) of substance use, HIV/STIs, mental disorders, and violence develop among YMSM and their partners over time; 2) Determine how relationship characteristics influence HIV risk behaviors and transmission among YMSM; 3) Describe networks and social influences on syndemic development among YMSM; 4) Determine if/how substance use increases risk of HIV infection and HIV viral load. We are enrolling YMSM who have participated in other IMPACT research studies and their partners to build a cohort of 1,350 participants over this five-year study. The scientific team includes psychologists, physicians, virologists, network scientists, and statisticians. The Center on Halsted and Chicago Department of Public Health are also partners in this study.
Indiana

Investigator: Xiaoming Jin, Ph.D.
Institution: Indiana University School of Medicine
Indianapolis, IN
Project Title: Homeostatic plasticity in the control of neuropathic pain
Research: Basic Research
Research Area: Neuropathic Pain; Homeostatic Plasticity; Somatosensory Cortex; Optogenetics; Electrophysiology; Two-Photon Imaging
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Students need to be interested in neuroscience and animal experiment. Students with background in biology and neuroscience or related fields, and with interest in medical science and medicine as career goal are encouraged to apply.

Project Description: Mild traumatic brain injury (mTBI) frequently occurs in sports, motor vehicle accidents, and falls. Currently there is no effective treatment. In this project, the student will be supervised and directed by a postdoc. In a mouse model of mTBI, herbal treatment will be applied for a period of time and the outcome will be measured with behavioral testing of motor function and histological techniques to evaluate changes in brain structure and cell death.
Iowa

Investigator: Ryan LaLumiere, Ph.D.
Institution: University of Iowa
Iowa City, IA
Project Title: Modulation of Synaptic and Behavioral Measures of Addiction by Acid-sensing Ion Channels
Research: Basic Research
Research Area: Cocaine; Self-administration; Rats; Circuitry; Behavior; Prefrontal Cortex
Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: The intern does not need to have prior research experience. However, the intern must be comfortable working with rats on a daily basis. The intern should also have a strong interest in discovering the neurobiological basis of behavior, especially addiction-related behavior, and preferably an interest in pursuing a career in neuroscience.

Program Description: Our laboratory investigates the neural mechanisms underlying cocaine-seeking behavior in rats. Therefore, the research project for the summer intern will involve conducting drug self-administration experiments in rats. The rats will then undergo extinction training, followed by reinstatement testing. The reinstatement serves as a model of relapse in drug-addicted individuals. During the reinstatement testing, activity in different brain regions can be altered to determine the role of those regions in regulating this behavior. In particular, the summer intern’s project will focus on the role of the infralimbic cortex in cocaine seeking. Our prior work indicates that this region is involved in the extinction of cocaine-seeking behavior. Therefore, our continuing work has focused on the precise mechanisms in this structure that underlie extinction learning. The intern’s project will examine how activation and blockade of different receptors within the infralimbic cortex influence the extinction of cocaine seeking. As part of this project, the intern will be involved in stereotaxic and catheter implantation surgeries, conducting the behavioral components of the task, and engaging in the necessary histology analysis following the experiment.
Investigator: Lane Strathearn, Ph.D.
Institution: University of Iowa
Iowa City, IA
Project Title: Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers
Research: Clinical Research
Research Area: Maternal; Oxytocin; Dopamine; Reward; Mother-Infant Synchrony; Functional MRI; Development
Earliest Start Date: 5/22/2018
Housing: Campus

Student Qualifications: Previous research experience is not required. However, the student should be interested in developing his or her own research interest and to have a true research experience. They will not be working with animals but only human research. College students can major in any area of science, psychology or neuroscience.

Program Description: Maternal drug addiction constitutes a major public health problem for both women and affected children, with long lasting consequences on children's social, emotional and cognitive development. Current treatment strategies tend to focus on the mother and her current addiction, rather than her relationship with her child, and developmental processes that may perpetuate the addiction problems, such as unresolved childhood attachment trauma, neglect, and chronic stress. Unlike mothers who find engaging with their own infant to be a uniquely rewarding experience, mothers with addictions may be less able to respond appropriately to their infant's cues, finding them less intrinsically rewarding or salient, and more stress provoking. Oxytocin, a neuropeptide with decreased peripheral levels seen in addicted mothers, is integrally involved in maternal brain and behavioral responses and may reduce some of these negative effects. The Attachment and Neurodevelopment Lab at the University of Iowa is conducting a randomized, placebo-controlled study of intranasal oxytocin on maternal brain responses. We will use functional MRI to examine how oxytocin affects the response of drug-exposed mothers to seeing their infant’s face cues. Summer students will assist in enrolling mothers and their babies, conducting interviews and videotaping mother-infant interaction. Infant face images are collected and edited for presentation within the functional MRI brain scanner during a subsequent visit.
Kansas

Investigator: Ryan Altman, Ph.D.
Institution: The University of Kansas
Lawrence, KS
Project Title: Evaluation of Physicochemical Properties Imparted by Fluorinated Peptidomimetics
Research: Drug Development Research
Research Area: Neuropeptides; Opioids; Fluorination; Synthetic Chemistry; Peptidomimetics
Earliest Start Date: 5/28/2018
Housing: Subsidized

Student Qualifications:
• Major or minor in chemistry (ongoing or completed)
• Completed two semesters of organic chemistry with hands-on laboratories
• Completed one or more semesters of biochemistry, neurochemistry, or a related field preferred
• Interests in synthetic organic chemistry essential
• Previous experience with synthetic organic chemistry (broadly defined) preferred

This research will not involve work with animals, humans and/or tissue samples

Project Description: Endogenous opioid peptides regulate activity within the central nervous system (CNS), and are particularly interesting for treating pain, depression, and anxiety. Unfortunately, clinical use of peptide-based agents is restricted by poor physicochemical and biophysical properties, which limit penetration into the CNS. Therefore, many peptide-based probes cannot be employed clinically for treating many disease states.

To address this problem, the Altman group explores the use of fluorinated peptidomimetics (FPMs) to improve the drug-like properties of peptides, and to deliver peptides into the CNS. To access these unique target molecules, the group has developed new synthetic methods and strategies, which should be broadly applicable for accessing FPMs to address many disease states. Efforts of an intern will focus on rational design and chemical synthesis of FPM-based analogs of opioid peptides. After completing the synthetic phase of the project, the target FPM molecules will be subjected to in vitro and in vivo distribution, metabolism, and pharmacokinetic studies in the laboratories of collaborators.
Investigator: Carmen Canavier, Ph.D.
Institution: Louisiana State University Health Center
New Orleans, LA
Project Title: A dynamic diversity of dopamine neurons
Research: Basic Research
Research Area: Computational Neuroscience; Multicompartmental Models; Dynamical Systems
Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: The student must be able to code in C and be familiar with working in the UNIX/Linux environment. An interest in neuroscience is required.

Project Description: Dopamine neurons in the mammalian midbrain are spontaneous pacemakers and also emit bursts of action potentials that are important reward-related signals. The electrical activity of distinct populations will be simulated by calibrating computational models to fit the electrophysiological data on diversity in the ionic currents expressed in these neurons. The simulation package NEURON will be used for these simulations.
Maine

Investigator: Elissa Chesler, Ph.D.
Institution: The Jackson Laboratory
Bar Harbor, ME
Project Title: Center for Systems Neurogenetics of Addiction
Research: Basic Research
Research Area: Behavioral Genetics; Computational Biology;
Bioinformatics; Genomics
Earliest Start Date: 6/2/2018
Housing: Campus

Student Qualifications: Students with background in behavior, genetics and genomics are most well-suited to work in the lab, although students with a behavioral interest are able to learn genetics and genomics through analysis of behavioral data. Students with computational experience including statistical data analysis using R, or significant python coding are able to contribute readily to data analysis and software development.

Program Description: Students working on projects in the Center for Systems Neurogenetics of Addiction will use data from behavioral genetic studies in combination with molecular genomic data and genetic data to find relations among genes and traits. The traits will include traits associated with addiction risk and in model organisms, with drug self-administration. Using quantitative genetics, genomics and bioinformatics, students will find genes associated with these traits. Students with an interest in behavioral science may assist in experimental work, including automated behavioral data acquisition and analysis. Students with an interest in biostatistics or bioinformatics will use existing software and analysis tools to interpret gene-behavior relations and to find relations across behaviors. Computational Science students will be able to participate in software development or visualization to enhance the tools used by many investigators to perform analyses.
Maine

Investigator: Vivek Kumar, Ph.D.
Institution: The Jackson Laboratory
Bar Harbor, ME

Project Title: Sequencing Mutant Mice with Altered Cocaine Responses
Research: Basic Research
Research Area: Genetics; Neuroscience; Computational Science; QTL Analysis

Earliest Start Date: 6/4/2018
Housing: Campus

Student Qualifications: Some experience with research methods, basic biology knowledge. Computational experience is helpful but not required.

Program Description: The Kumar Lab uses functional genomics approaches in mice to dissect motivational reward pathways. The misregulation of these pathways lead to many disorders including addiction, attention deficit and hyperactivity disorder, and depression. We use two approaches - forward genetic ethynitrosourea (ENU) mutagenesis screens and quantitative genetics (QTL analysis) - to identify genes and pathways that regulate these behaviors. Powerful and unbiased, forward genetic approaches make no a priori assumptions and only require a clear well-defined assay for gene discovery. We have established a high throughput screening pipeline to discover mutants for acute cocaine response and open field behavior. The recorded behavioral data is rich and can be analyzed for many phenotypes. This forward genetic approach is highly flexible and can be applied towards many neurological phenotypes. Our goal is to establish a leading research group using genetics as its foundation, and a combination of biochemistry, physiology, imaging, and computer vision techniques to dissect complex reward behavior in mammals.
Investigator: Victoria Coleman-Cowger, Ph.D.
Institution: Battelle Memorial Institute
Baltimore, MD
Project Title: Comparison of Substance Use Screeners in Assessing Prescription Drug Abuse and Other Illicit Drug Use among Pregnant Women
Research: Behavioral Research
Research Area: Maternal and Child Health; Substance Use; Screener Validation; Mixed Method Study Design; Pregnant Women; Birth Outcomes; Health Disparities
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Preference will be given to those with a background in psychology, public health, or maternal and child health; interest in research involving pregnant women; familiarity with SPSS; and strong written communication skills. This work will not require students to work with animals, tissue samples, or study participants, as data collection will be complete.

Project Description: Prescription drug abuse and illicit drug use during pregnancy can lead to multiple health and social problems for both mother and child yet both are often under-recognized in primary care settings, perhaps due to current evidence being insufficient for the United States Preventive Services Task Force to make a screening recommendation. This research project will determine which screening measure(s) works best in identifying prescription drug abuse and illicit drug use among pregnant women by utilizing an innovative study design including mixed quantitative and qualitative methods, and will widely disseminate study findings in a variety of settings. Study aims are to: (1) conduct validity analyses to determine sensitivity, specificity, usability, and how each scale compares to the others and to the gold standard of urine and hair drug testing in identifying prescription and illicit drug use; (2) determine the impact of clinic population variables (age, race, trimester of pregnancy) on validity of the three substance use screeners; and (3) assess birth outcomes (birth weight, gestational age, head circumference, and NICU admissions) associated with the most widely used prescription drug and multi-drug exposure.
Maryland

**Investigator:** Fereshteh Nugent, Ph.D.
**Institution:** Uniformed Services University
Bethesda, MD

**Project Title:** Effects of early life stress on synaptic function and DA signaling in the VTA

**Research:** Basic Research

**Research Area:** Synaptic Plasticity; Addiction; Early Life Stress; Depression; Dopamine; Mesolimbic Dopamine Pathway; Reward Pathway, VTA, LHb

**Earliest Start Date:** 6/1/2018

**Housing:** Subsidized

**Student Qualifications:** There is no need for prior research experiences. College students are preferable. The intern should be able to work with animals (rats) and brain tissues for staining.

**Project Description:** The study will involve molecular and behavioral approaches to identify physiological, epigenetic modifications and behavioral phenotype associated with severe early life stress (maternal deprivation in rats) in mesolimbic dopamine pathway. The intern will perform, analyze and prepare immunohistochemical and immune-blotting data for presentation at laboratory group meeting. He/she will also be involved in characterization of behavioral modifications induced by severe early life stress such as behavioral despair and social dysfunction. Maintains detailed and organized records of experimental procedures and observations for the behavioral, immunohistochemical and molecular studies.
Massachusetts

Investigator: Camron Bryant, Ph.D.
Institution: Boston University School of Medicine
Boston, MA
Project Title: Bridging Genetic variation with Behavior: Molecular and Functional Mechanisms of Quantitative Trait Gene Regulation of the Stimulant and Addictive Properties of Methamphetamine in Mice
Research: Basic Research
Research Area: Genetics; Opioid; Withdrawal; Reward; Conditioned Place Preference; Anxiety; Elevated Plus Maze; Gene Expression; Addiction Liability; Food Addiction; Gene Editing; Self-Administration; Intracranial Self-Stimulation; Substance Use Disorders; Neonatal Abstinence Syndrome
Earliest Start Date: 5/28/2018
Housing: Campus

Student Qualifications: Basic knowledge of molecular biology and/or experience in the statistical software environment are desired, but not required. Some experience in pipetting is required. Some background in classical genetics would be helpful. Motivation, carefulness, and pride in their work (no matter how large nor how small the task) and attention to detail are the key ingredients. A career interest in the genetic and neurobiological basis of psychiatric disorders would be beneficial.

Project Description: Substance abuse disorders are heritable psychiatric conditions whose genetic basis remains largely unknown. Mammalian model organisms offer a powerful, complementary tool for accelerating the discovery of novel genetic factors and neurobiological mechanisms in humans. The Laboratory of Addiction Genetics integrates classical forward genetics in mice with contemporary genome editing and transcriptomics to understanding the mechanisms that confer susceptibility versus resistance toward the addictions. We are committed to the development and refinement of behavioral models across multiple abused substances that most directly gauge the contribution of natural genetic variation to behavior and bridging these discoveries with –omics and molecular genetics to validate candidate genes, functional variants and neurobiological mechanisms. This multi-pronged approach leverages our ability to make discoveries that could translate to new pharmacotherapeutic avenues for treatment and prevention. Potential activities for the trainee could include video tracking and data curation for quantitative genetic analysis and training in running the R Package R/qtl for various behavioral traits. Additional training includes DNA extractions and real-time quantitative PCR for measuring gene expression of candidate genes and immunoblotting for measuring protein levels. Pending prompt animal training and protocol approval, the student could also potentially be involved in running behavioral studies.
Massachusetts

Investigator: Peter Friedmann, M.D., M.P.H.
Institution: Baystate Medical Center
            Springfield, MA
Project Title: Drug Injection Surveillance and Care Enhancement for Rural Northern New England
Research: Epidemiology Research
Research Area: Rural; Drug Injection; Opioid Use Disorder; HIV; Viral Hepatitis; Epidemiology; Service Utilization
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Students will be working with a stigmatized human population with great social and health care deficits in rural parts of Massachusetts, New Hampshire and Vermont. Qualifications include excellent interpersonal and communication skills; a flexible, non-judgmental attitude; a willingness to work in low-resourced community settings with marginalized persons; and an ability to follow directions. A current driver’s license and a car preferred. Tattoos or piercings are welcomed.

Program Description: In 10 rural counties in MA, VT and NH adjacent to I-91, the DISCERNNE project will recruit and interview out-of-treatment persons who inject drugs to examine their risk behaviors for HIV, hepatitis C and overdose; their networks of fellow drug users; service use and needs. The field recruitment phase will occur during the spring, summer and fall of 2018.
Massachusetts

Investigator: Constance Horgan, Sc.D.
Institution: Brandeis University
Waltham, MA

Project Title: Center to Improve System Performance of Substance Use Disorder Treatment

Research: Other Research
Research Area: Health Services Research; Addiction Treatment; Systems of Care; Organization, Financing, Quality of Care; Service Delivery; Health Policy; Access to Care

Earliest Start Date: 5/15/2018
Housing: Subsidized

Student Qualifications: None listed

Program Description: The summer intern will contribute general research support to various research projects within the Brandeis-Harvard NIDA Center to Improve System Performance of Substance Use Disorder Treatment. Research activities include conducting literature reviews; assisting with basic data analysis, preparation of presentations and manuscripts for submission to professional journals. Interns will attend weekly research meetings and will report directly to the Principal Investigator and/or Project Manager.
Massachusetts

Investigator: Gabriel Kreiman, Ph.D.
Institution: Harvard Medical School, Children's Hospital
Cambridge, MA

Project Title: Neural circuits for cognitive control
Research: Basic Research
Research Area: Human neurophysiology, Computational Neuroscience,
Cognitive Neuroscience

Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Neuroscience
Computer programming is a plus (any language, particularly MATLAB, python, etc.)
Students will work with human subjects
Previous research experience is a plus but is not required

Project Description: This research effort involves studying the neural mechanisms responsible for cognitive control. Cognitive control refers to the ability for information processing and behavior to vary adaptively from moment to moment depending on current goals, rather than remaining rigid and inflexible. We combine behavioral psychophysics experiments, invasive neurophysiological recordings in the human brain and computational models to understand the neural circuitry orchestrating cognitive control. The student will learn about computational neuroscience, about human neurophysiological recordings on patients, and behavioral experiments.
Massachusetts

Investigator: Steven Liang, Ph.D.
Institution: Massachusetts General Hospital
Boston, MA

Project Title: Novel PET Tracers for Imaging Monoacylglycerol Lipase in Endocannabinoid Signaling
Research: Other Research
Research Area: Drug Abuse, Endocannabinoid System, Positron Emission Tomography, Radiochemistry, PET Imaging

Earliest Start Date: 7/1/2018
Housing: Subsidized

Student Qualifications: While full training in all aspects of the work will be provided it would be an advantage if the successful candidate has practical knowledge and previous experience of organic chemistry, general biology or imaging background. The work doesn’t involve direct contact with animals, humans, and/or tissue samples (observer is optional).

Project Description: Fluorine-18 is a short-lived (t1/2 = 109.7 min) positron emitting isotope which now finds immense importance as a label for radiotracers used with the non-invasive molecular imaging technique of positron-emission tomography (PET) for a broad range of applications including clinical diagnosis in drug abuse and drug discovery towards the treatment. The demand for new PET agents to probe biological processes and targets related to drug addiction in vivo is growing rapidly now as a consequence. The Division of Nuclear Medicine and Molecular Imaging at Massachusetts General Hospital and Harvard Medical School is seeking talented and enthusiastic summer research interns to work in the Radiochemistry and Imaging group of Dr. Steven Liang. The successful candidate will work closely with senior research scientists, post-doctoral scholars, medical fellows and faculty members in assisting our group efforts toward preclinical development and evaluation of novel positron emitting radiotracers for drug abuse research.

Aims
1. Learn basic theory of radiochemistry and molecular imaging technique of positron-emission tomography (PET) and other related imaging modalities.
2. Process data for PET imaging studies
3. Learn basic organic and medicinal chemistry skills
4. Learn research management and create data library from literature of drug abuse
5. Establish database for updating advances in radiochemistry and/or PET imaging in drug addiction research
Massachusetts

Investigator: Charles M. Lieber, Ph.D.
Institution: Harvard University
Cambridge, MA
Project Title: Syringe Injectable Electronics Platform for Chronic Mapping and Modulation of Neural Circuits in Addiction
Research: Basic Research
Research Area: syringe-injectable electronics, electrophysiology, neural circuits in addiction, alcohol addiction, mapping neural activity, modulation of neural activity, rodent models of addiction
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Students with backgrounds in biology, chemistry, physics and/or electrical engineering would all be suitable. The main requirement is an interest in learning new skills and concepts, although willingness to perform experiments with live rodents is a requirement for the second and third areas of research.

Project Description: The intern will be expected to focus on one of three interrelated areas central to the overall project, with the specific focus defined by background and interests. Overall, the research is focused on developing and applying a new paradigm for implantable electrophysiology probes, syringe-injectable mesh electronics, to overcome previous limitations of in-vivo chronic recording and thereby enable stable long-term mapping and modulation of neuronal signals with single neuron resolution across the multiple brain regions associated with the addiction. In this context, three project areas available for an intern are as follows: (1) Design, fabrication and testing of new mesh electronics probes that can be used to target distinct brain regions for both recording and stimulation; (2) Syringe-based mesh electronics implantation and subsequent chronic histology to validate targeting and define tissue response; and (3) Chronic recording studies to define circuit evolution associated with the rodent alcohol addiction model.
Student Qualifications: It is desired that interns placed in our lab have previous behavioral neuroscience research experience, although not required. Interns will be conducting a number of behavioral tests with rats, assisting with surgeries, and will also be exposed to basic neuromolecular techniques. We would like students who are enthusiastic about our research topic, motivated and responsible. Ideally, we would like students who are interested in attending graduate school and in pursuing a career in academia.

Project Description: We are interested in the role incentive stimuli play in controlling drug-seeking behavior and relapse, and the neurobiological systems by which they exert their control. We utilize a rodent model that captures individual differences in the extent to which cues attain incentive motivational value and gain control over behavior. Our work indicates that there is large individual variation in the degree to which reward-related cues are attributed with incentive salience. Using a classical Pavlovian conditioning paradigm, we have shown that for some individuals, sign-trackers, a reward cue attains great incentive motivational value; whereas for others, goal-trackers, the reward cue serves merely as a predictor. This animal model allows us to parse the psychological and neurobiological components underlying these distinct forms of stimulus-reward learning and will shed light on the processes that go awry in addicts. The procedures routinely used include behavioral techniques such as drug self-administration, repeated psychostimulant administration, Pavlovian conditioning, and tests for novelty-seeking and impulsivity. In addition, immunohistochemical and chemogenetic procedures are being employed. Students will have the opportunity to assist with surgeries, behavioral testing, and neuroanatomical procedures.
Michigan

Investigator: Shane Perrine, Ph.D.
Institution: Wayne State University
Detroit, MI
Project Title: Effects of cocaine taking and seeking on histone deacetylase class IIa enzyme activity in the nucleus accumbens of rats
Research: Basic Research
Research Area: preclinical, translational neuroscience, cocaine, psychostimulant, anxiety, posttraumatic stress disorder, histone deacetylase, neuroimaging, behavior
Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: The intern does not require previous research experience, but he/she must be willing to learn, work hard, be responsible, and communicate well. The student(s) will be required to work with rodents and brain tissue samples.

Project Description: The goal of our research is to better understand the neuronal circuitry and molecular mechanisms that underlie substance use disorders, posttraumatic stress disorder, and their co-occurrence. We use rodent models of these disorders, behavioral tasks, neuroimaging, and molecular techniques to identify the brain-behavior relationships that develop after exposure to traumatic stress and/or drugs and ways the brain changes to lead to addiction or PTSD. A major focus of our lab is on the comorbidity between PTSD and substance use disorders and exploration of the neurobiology of the reward and stress-trauma neurocircuitry.
**Minnesota**

**Investigator:** William Iacono, Ph.D.

**Institution:** University of Minnesota

**Minneapolis, MN**

**Project Title:** Twin Family Study of Vulnerability to Substance Abuse

**Research:** Behavioral Research

**Research Area:** Twins, behavioral genetics, substance use, externalizing, personality, behavioral disinhibition, magnetic resonance imaging (MRI), psychophysiology, neurocognition, longitudinal

**Earliest Start Date:** 5/20/2018

**Housing:** Campus

**Student Qualifications:** We seek students with an interest in the effects of substance use on the brain and functioning in important areas, such as mental/physical health, relationships, and academics/work. A Bachelor’s degree in psychology, neuroscience, or a related discipline is desired. Students will work with human MRI and other data. Although previous research experience is not required, students should have a demonstrated ability to carry out a project from start to finish and attention to detail is a must.

**Program Description:** This research project has been studying functioning in important domains in a large sample of twins since they were 11 years old - twins are now adults, and the project is collecting magnetic resonance imaging (MRI) data of brain structure and functioning. Research clearly demonstrates that problematic substance use is associated with brain deviations, but it’s as yet unclear whether this association reflects an effect (e.g., a neurotoxic effect) of substances on the brain or whether the brain of a person with problematic substance use differed even before beginning to use substances. By taking advantage of differences in substance use of twins within a twin pair, this project can disentangle liability toward developing problematic substance use from an effect of substances on the brain.
**Mississippi**

**Investigator:** Kristine Willett, Ph.D.  
**Institution:** University of Mississippi  
**Project Title:** Developmental Toxicity of Cannabidiol and Δ9-Tetrahydrocannabinol  
**Research:** Other Research  
**Research Area:** Developmental Toxicology, Multi-Generational Toxicity, Zebrafish, Behavior, Reproduction, Cannabinoids  
**Earliest Start Date:** 5/27/2018  
**Housing:** Campus

**Student Qualifications:** Intern must be willing to work with animals (zebrafish) and tissue samples, and the intern should be interested in pharmaceutical/biomolecular sciences. Previous research is not required.

**Project Description:** Children will be increasingly exposed to both THC as legalization and use of marijuana expands and to CBD through its use in pharmaco-resistant epilepsy. This proposal will provide critical lacking data on the molecular mechanisms and potential lifelong and multigenerational adverse outcomes that could result as a consequence of THC and/or CBD developmental exposure. We will utilize the zebrafish model to assess phenotypic alterations caused by two developmental exposures (either during organogenesis or sexual differentiation) and mechanistically link the adverse outcomes with targeted and global transcriptomic analyses. Using an adverse outcome pathway paradigm will allow us to rigorously differentiate the unique dose-, tissue-, sex- and developmental stage-dependent effects of CBD and THC and will provide insight into the molecular pathways underlying the morphological, behavioral and neuroendocrine/reproductive toxicities of cannabinoids.
Missouri

**Investigator:** Chen, Li-Shiun, Ph.D.
**Institution:** Washington University  
St. Louis, MO
**Project Title:** Genetically Informed Smoking Cessation Trial
**Research:** Epidemiology Research  
**Research Area:** pharmacotherapy, smoking cessation, genetics
**Earliest Start Date:** 6/4/2018
**Housing:** Campus

**Student Qualifications:** Research may require interaction with human research participants. Students should be comfortable interacting with patients and research participants from diverse backgrounds. Previous research experience is not required. Applicants must have the ability to follow oral and written instructions.

**Project Description:** This project is to study how people quit smoking cigarettes and what treatments help them. More specifically, we are studying human smoking behaviors, the natural history of smoking cessation, and quit attempts. We will examine various cessation milestones (initial quit, lapse, relapse, and continuous abstinence), genetic markers, environmental risks (peer and family smoking), nicotine dependence treatments, and comorbid psychiatric disorder. This work will help us understand the biology of smoking behaviors, and provide evidence for future studies of personalized smoking cessation treatments.
Missouri

Investigator: Jose Moron-Concepcion, Ph.D.
Institution: Washington University
St. Louis, MO

Project Title: In Vivo Imaging of Dynamic Structural Plasticity Driving Morphine Conditioned Place Preference

Research: Basic Research
Research Area: Mechanisms Underlying Opioid Dependence, Opioid Analgesic Tolerance during Chronic Pain and the Interaction between Chronic Pain and Opioid Abuse.

Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: It is highly desirable that applicants have prior experience with animal research. However, if this is not the case appropriate training will be provided.

Project Description: A disturbing trend in the U.S. is the increasing non-medical use and abuse of prescription opiates. The most recent National Survey on Drug Use and Health (NSDUH) report, for example, revealed that approximately 7 million people used prescription pain relievers for non-medical purposes in 2012, and 1.9 million people were dependent on or abused prescription pain relievers. The continuing trend in the increase of non-medical use and abuse of prescription opiates (i.e. morphine) in the U.S. has resulted in increased morbidity, mortality, and economic costs at the individual, local, and national levels. Although opiates are used widely in clinical practice for the treatment of both acute and chronic pain (i.e. inflammatory pain), it is surprising that relatively few studies have examined the neural mechanisms underlying the abuse liability of commonly prescribed opiate medications during pain conditions.
### Nebraska

**Investigator:** Shilpa Buch, Ph.D.

**Institution:** University of Nebraska Medical Center
Omaha, NE

**Project Title:** HIV Tat & cocaine-mediated alterations in microglial migration & activation involve epigenetic regulation of miRNAs

**Research:** Basic Research

**Research Area:** HIV; Cocaine; HIV-associated Neurological Disorders (HAND); Endoplasmic Reticulum Stress (ER Stress); HIV-1 Tat; Chronic Neuroinflammation; Glial Fibrillary Acidic Protein (GFAP); Cell Signaling; Astroglisis; Cytokines

**Earliest Start Date:** 6/4/2018

**Housing:** Subsidized

**Student Qualifications:** The intern should have a demonstrated interest in science and a desire to conduct research. Good communication skills are a must. In this application, the intern will not have contact with animals or tissue samples. Prior research experience is preferred but not required.

**Program Description:** In era of antiretroviral therapy, HIV-infected individuals are living longer and the incidence of HIV-associated dementia (HAD) is greatly reduced. However, increased survival rates have led to an increase in the prevalence of HIV-associated neurological disorders (HAND). Drugs of abuse have been shown to accelerate the incidence and prevalence of HAND. Since HIV does not infect neurons, most neuroinflammation and subsequent neuronal damage results from glial cell activation including astrocytes. This project will examine the role of HIV viral protein tat and/or cocaine on the activation of astrocytes and whether activation is mediated via endoplasmic reticulum stress (ER Stress). Astrocyte activation will be measured by increased expression of the structural protein glial fibrillary acidic protein (GFAP) as measured by western blot from cell lysates. The intern will learn to culture both primary mouse astrocytes and the human astrocytic cell line A172. The intern will then learn the entire process of performing western blots from making the gels to analyzing the resulting blots.
New York

Investigator: Katherine Elkington, Ph.D.
Institution: New York State Psychiatric Institute/Columbia University
New York, NY

Project Title: Health and Justice: A Continuum of Care for HIV and SU for Justice-Involved Youth
Research: Behavioral Research
Research Area: Reducing HIV/AIDS incidence; Reducing STI incidence; Substance abuse prevention; Justice-involved young adults

Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: Skills:
- Extremely organized and detail orientated
- Excellent communication and interpersonal skills

Major/Career Interest:
- Interest/Education in Psychology, Social Work, Criminal Justice, Health

Research Requirements:
- Interns will work with humans, interns may be asked to handle STI test samples

Research Experience:
- Previous experience conducting research recruitment or interviews is preferred but not required

Project Description: Justice involved youth are at high risk for HIV and have high rates of substance use and disorders. The MOVE UP study will determine the efficacy of delivering a health intervention that aims to inform justice involved young adults aged 18-24 about HIV/STIs and substance use, and motivate and empower them to avoid behaviors that put their health at risk.
New York

Investigator: Perry Halkitis, Ph.D., M.P.H.
Institution: New York University
New York, NY
Project Title: Syndemic Production among Emergent Adult Men
Research: Behavioral Research
Research Area: HIV, STIs, gay & bisexual men, sexual behavior, substance use, mental health
Earliest Start Date: 6/4/2018
Housing: Campus

Student Qualifications: CHIBPS is looking for students who are comfortable working with diverse populations and discussing sensitive topics such as sexual behavior and drug use. We are also looking for students with strong interpersonal skills, great attention to detail, respect for confidentiality and the ability to multi-task. This research requires students to work with human subjects, specifically racially/ethnically diverse gay, bisexual and other men who have sex with men.

Project Description: The Project 18 Cohort Study follows the development of syndemics among a racially/ethnically diverse group of young gay, bisexual and other men who have sex with men. Participants are asked about their sexual behavior, substance use, mental health burden and relationships; they also receive HIV and STI testing. The intern’s project would be to contribute to data collection and data entry for Project 18. They would contribute to data collection by assessing participants; this involves asking them about their social networks, sexual behaviors and substance use. Data entry involves inputting pen and paper surveys into programs like SPSS and Qualtrics. Interns would also contact participants for their follow-up appointments.
New York

Investigator: Christina Hoven, Dr. Ph, M.P.H.
Institution: New York State Psychiatric Institute/Columbia University
New York, NY
Project Title: Cognitive Control in Children of SUD Parents: A Longitudinal Multimodal MRI Study
Research: Epidemiology Research
Research Area: Brain Imaging (MRI), Neuroscience of Decision Making, Epidemiology.
Earliest Start Date: 5/20/2018
Housing: Campus

Student Qualifications: Students should be at least entering junior year at college, with an interest in neuroscience, medicine, psychology, computer science. Applicants should preferably reside in greater NY area (including Long Island, NJ and CT).

A) This internship will focus on MRI data analysis. It requires excellent computer skills; matlab/imaging tools desirable. 2 students
B) This internship will focus on epidemiology research. I will entail data entry, review and fieldwork (interviews/recruitment).

Project Description: The overall Aim of the Adolescent Imaging Study is to longitudinally examine, in a large group of 12-14 year old’s at baseline, the effects that family history of substance use (SU) disorder has on developing cognitive control abilities and related brain neurocircuitry, and on SU initiation, early onset, and problematic SU trajectories. The first wave of psychiatric interviews and MRI data collection including anatomical, functional and resting stated data has been recently completed. MRI data analysis at the individual and group level is currently underway. Additionally, initial functional connectivity analysis of the fMRI data, and integration of multiple MRI modalities data will take place during the summer months. Results from subjects' psychiatric diagnostic scales will inform MRI group analysis in all MRI modalities. Interns will learn fMRI data analysis at individual and group level, incorporating key measures obtained from baseline questionnaires, including psychiatric diagnoses, socio-cultural context and family measures, to improve understanding of factors that affect youth risk behavior. This laboratory offers excellent experience for students interested in pursuing graduate level work in neurosciences, psychiatry, psychology, public health, related medical fields or law.
New York

Investigator: Yasmin Hurd, Ph.D.
Institution: Icahn School of Medicine at Mount Sinai
             New York, NY
Project Title: Neurodevelopmental Effects of Cannabis and its Epigenetic Regulation
Research: Basic Research
Research Area: marijuana, heroin, neurodevelopment, mesocorticolimbic brain regions, developmental effects of drugs, adolescent, prenatal, nucleus accumbens, prefrontal cortex, stress, depression, addiction, epigenetics, mRNA
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Qualified students usually have an interest in neuroscience, but not a requirement. Previous experience in research areas relevant to biochemistry, molecular biology, animal behavior or anatomy are all welcome. The research conducted in our lab will provide students with an opportunity to conduct behavioral work with animal (rodents) and to carry out postmortem brain studies on animal and human tissue. Although previous research experience is highly regarded, but it is not a requirement.

Program Description: Our research studies the long-term impact of developmental cannabis exposure through the use of multiple techniques. We use animal models to provide information about the causal relationship between adolescent or prenatal exposure to tetrahydrocannabinol (THC; the psychoactive component of cannabis) and behaviors in adulthood relevant to addiction and psychiatric vulnerability. We study molecular and biochemical changes in the brains of THC-exposed animals in order to identify the specific genes and brain pathways that are associated with addiction vulnerability. We use state-of-the-art techniques to study molecular mechanisms in discrete cells and their specific link to behavior in order to identify the mechanisms that maintain the long-term effects of cannabis. We also conduct translational studies in humans in order to understand the relevance of our animal work to human addiction populations. In addition, human molecular and genetics studies are conducted in relation to opioid use disorders and in complementary animal models.
New York

Investigator: Paul Kenny, Ph.D.
Institution: Icahn School of Medicine at Mount Sinai, New York, NY
Project Title: Role of MicroRNAs in the Mechanisms of Drug Dependence
Research: Other Research
Research Area: Addiction, Extended Access, Behavior, Catherization
Earliest Start Date: 6/1/2017
Housing: Subsidized

Student Qualifications: Running rodent behavioral tests and executing molecular biology experiments is challenging, and we require applicants to have the following skills:
- Comfortable handling animals
- Basic molecular biology skills
- Precise execution of experiments with attention to detail
- Good record keeping and observational skills
- Clean work habits

Project Description: Drug addiction can be viewed as resulting from maladaptation to the brain’s natural reward processes. The signaling cascades and molecular processes underlying these maladaptive processes remain to be fully elucidated. Previous work in the Kenny laboratory has identified a key role for striatal microRNAs in regulating the reinforcing properties of cocaine. The current research project aims to further probe the role microRNAs and other non-coding RNAs play in the pathological maladaptations that underlie compulsive drug-seeking behaviors. We will adopt a multidisciplinary approach using complex rodent behavioral paradigms as well as manipulation of various components of reward relevant signaling cascades both in vitro and in vivo. The aim of the project is to facilitate the development of novel medications for human addicts.
## New York

**Investigator:** Paul Meyer, Ph.D.  
**Institution:** University at Buffalo  
**Buffalo, NY**  
**Project Title:** Integrated GWAS of Complex Behavioral and Gene Expression Traits in Outbred Rats  
**Research:** Basic Research  
**Research Area:** Drug addiction, Behavioral Genetics  
**Earliest Start Date:** 5/18/2018  
**Housing:** Campus

**Student Qualifications:** High school diploma is preferred, especially with undergraduate coursework in science and biology. Students will be working with rat test subjects. No previous research is required.

**Project Description:** Interns can participate in any projects in our laboratory (see below, and meyerlabscience.org for more information):

A hallmark of addiction is the ability of drug-associated stimuli (“cues”) to instigate drug-taking, even after periods of abstinence. We use many conditioning paradigms to determine under which conditions these drug cues acquire the ability to influence behavior. For example, we model drug taking in our laboratory using intravenous and oral self-administration in rats, with a focus on nicotine, cocaine, and alcohol. Among other findings, we have found that nicotine enhances alcohol intake by altering how rats respond to alcohol cues, and have established relationships between the response to food cues, drug cues, impulsivity, and cue-induced relapse.

We are also in the process of testing and genotyping 1600 rats on tests of cue responsivity and behavioral regulation, with the goal of generating a ‘map’ of genomic locations that influence these behaviors. As candidate genes emerge from this research, we will conduct several follow-up studies examining the precise roles of these genes in addiction. For example, we are using genetically modified rats to determine whether these specific genes influence drug-taking in animal models of addiction. For more information on our mapping project see www.ratgenes.org.
New York

Investigator: Teresa Milner, Ph.D.
Institution: Weill Cornell Medicine
New York, NY
Project Title: Stress-Opioid Interactions in Hippocampus
Research: Basic Research
Research Area: opioids, sex differences, learning relevant to addiction, hippocampus
Earliest Start Date: 5/29/2018
Housing: Subsidized

Student Qualifications: Requirements: enrolled in college, taken courses in chemistry, biology and math and familiar with statistics.
Work with fixed rodent brain tissue & use anatomical techniques: 1) cutting brains on vibratome; 2) single and dual label light & electron microscopic immunocytochemistry; 3) in situ hybridization; 4) photograph specimens on light and electron microscopes; 5) computer assisted analysis and statistics.

Program Description: Women are more susceptible than men to several aspects of drug addiction, including relapse due to stressful events. Drug addiction requires associative memory processes that critically involve the hippocampus, including the opioid system. Our studies in rats support the hypothesis that alterations in the hippocampal opioid system induced by chronic stress predispose females to enhanced sensitivity to oxycodone and promote drug-related associative learning. The student will be involved in ongoing anatomical and molecular studies analyzing alterations in the distribution or expression of opioid peptides and receptors within hippocampus of female and male rats following oxycodone conditioned-place preference (CPP), a behavior where they learn to associate oxycodone with a place. The student will work in a collaborative environment to learn several different techniques to test this hypothesis. In particular, the student will be taught quantitative light and electron microscopic immunocytochemical techniques and well as in situ hybridization methods. These studies will provide potential mechanisms for sex differences in how chronic stress affects neurons that release, express or respond to opioids, to impact hippocampal-dependent learning relevant to drug abuse. The results of these studies will have important implications towards tailoring treatment interventions to maximize positive outcomes in females as well as males.
New York

Investigator: Saleem Nicola
Institution: Albert Einstein College of Medicine
Bronx, NY
Project Title: Neural Mechanisms of Accumbens-Dependent Impulsivity
Research: Basic Research
Research Area: Nucleus Accumbens, Prefrontal Cortex, Plasticity, Behavior, Drug Seeking
Earliest Start Date: 6/4/2018
Housing: Campus

Student Qualifications: A student with interests in the neuroscience of drug addiction is preferred. No experience is required. The work will require handling and experimenting on rats.

Project Description: Addiction is a disease of aberrant learning, but it is unclear how synaptic plasticity gives rise to the circuit activity that promotes drug seeking. In this project, the student will determine whether the projection from the dorsomedial prefrontal cortex (dmPFC) to the core of the nucleus accumbens (NAcC) is required for learning cued approach behavior. The neural circuits controlling this behavior are likely targets of drugs of abuse, and therefore understanding how plasticity occurs in this circuitry will ultimately allow us to determine how drugs bias learning towards acquisition of drug seeking. Using a viral vector, the student will first express an inhibitory designer receptor exclusively activated by designer drug (DREADD) in the dmPFC of rats. The DREADD will allow the projection to be inhibited by microinjection of the DREADD agonist CNO directly into the NAcC. The student will train animals on a cued approach task, injecting either CNO or saline into the NAc prior to each training session. If the CNO injections impair learning, this would suggest that the dmPFC-NAcC projection is required for learning the task. The student will train, without injections, an additional (yoked) group of rats, which will be allowed to respond only to the number of cues to which the CNO-injected rats successfully responded. If the CNO group learns more slowly than the yoked group, it would strongly suggest that plasticity (and not performance) was affected by activation of the DREADD.
New York

Investigator: Vinayaka Prasad, Ph.D.
Institution: Albert Einstein College of Medicine
Bronx, NY

Project Title: Effect of drugs of abuse on CNS HIV-1 reservoirs and neuropathogenesis
Research: Basic Research
Research Area: Drug abuse, CNS HIV reservoirs, HIV latency, latency establishment, HIV reactivation, effect of drug abuse

Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: The intern is expected to have a strong aptitude in research, must have taken courses in biology, molecular biology or gene expression and cell biology and some experience in laboratory research.

Program Description: The intern will study how the drugs of abuse will affect the establishment of HIV latency, the size of the HIV reservoir and the efficiency of reactivation. Understanding the brain HIV reservoirs and eliminating them is an urgent problem. Drugs of abuse are known to exacerbate the infection as well as enhance the damage to the central nervous system. Therefore, the current project is aimed at addressing these issues. We will employ an in vitro blood brain barrier model comprising of human brain microvascular endothelial cells (HBMECs), astrocytes and pericytes. The methods to be employed include in vitro infection of human microglial across a blood brain barrier in the presence of drugs of abuse and the use of novel imaging procedures to quantify latent reservoirs to understand both establishment and maintenance of HIV reservoirs.
North Carolina

Investigator: Stacy Daughters, Ph.D.
Institution: University of North Carolina at Chapel Hill
Chapel Hill, NC
Project Title: Technology Enhanced Behavioral Activation Treatment for Substance Use
Research: Clinical Research
Research Area: Substance Use, Reward Processing, Distress Tolerance, Behavioral Activation, Clinical Psychology, Technology Enhanced Treatment, fMRI
Earliest Start Date: 5/18/2018
Housing: Campus

Student Qualifications: Individuals applying for an internship with the BRANE lab should have at least 1 year of coursework in Psychology or Neuroscience including completion of a research methods course, minimum GPA of 3.0, and interest in clinical research with a substance using population.

Program Description: The Biobehavioral Research on Addiction and Emotion (BRANE) lab in the Department of Psychology and Neuroscience at the University of North Carolina, Chapel Hill focuses on examining the mechanisms contributing to substance use disorders and translating this knowledge into the development and testing of novel treatment approaches. We conduct both experimental and treatment outcome research integrating behavioral, biological and neural assessment methodology.

Individuals selected as interns with the BRANE lab will contribute to our ongoing study, Technology Enhanced Behavioral Activation Treatment for Substance Use. This study aims to assess the impact of a technology enhanced behavioral treatment for substance use on post treatment abstinence. Additionally, we utilize functional magnetic resonance imaging (fMRI) to examine how neural correlates of reward processing are associated with treatment response with a goal of identifying predictive biomarkers of treatment success.

Responsibilities for this internship include but are not limited to subject recruitment and retention including participant tracking and locating, data collection (self-report, interview, and behavioral assessments) at off-campus locations throughout the triangle area, and data entry and management. Visit us at http://www.branelab.web.unc.edu
North Carolina

Investigator: Kathryn Reissner, Ph.D.
Institution: University of North Carolina Chapel Hill
Project Title: Astrocyte-mediated mechanisms of cocaine seeking
Research: Basic Research
Research Area: addiction, cocaine, astrocyte, neuron, rat, self-administration, synaptic plasticity, reinstatement, glutamate transport

Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: No prior experience is required. Some background in neuroscience is a valued plus, but is not absolutely required. However, a conscientious nature is absolutely critical. The successful applicant will be responsible for daily training of rats, and some processing of brain tissue at the end of the experiment. Work with live vertebrate animals requires keen and constant attention to detail and to the well-being of the animal. The intern will be trained in all concepts and techniques.

Project Description: Our lab uses the rat self-administration model to study behaviors, neurocircuitry, and molecular pathways which contribute to cocaine addiction. In particular, we are interested in how cocaine self-administration leads to changes in neuron-astrocyte communication within the brain's reward circuitry, and how these changes in communication contribute to long-lasting drug seeking behaviors. Preliminary data indicate that following withdrawal from cocaine self-administration, astrocytes in the nucleus accumbens are smaller and make fewer synaptic contacts than astrocytes from saline control animals. The available summer project will be designed to follow up on this preliminary finding, and investigate how cocaine seeking after withdrawal affects three-dimensional structure of astrocytes, and astrocyte-neuron communication. The summer student will learn how to perform rat surgical catheterization, how to provide post-operative monitoring and care, and how to perform and analyze self-administration behavior. The intern can also participate in morphometric analysis of astrocytes, using immunohistochemistry, expression of fluorescent markers, and confocal microscopy. Projects are also available to investigate the relationship between astrocyte retraction and expression of ionotropic glutamate receptors (NMDA, AMPA) in neurons. Our lab is a fun and collaborative environment where we work together toward education and advancement of knowledge in the neurobiology of addiction.
North Carolina

Investigator: Lisa Tarantino, Ph.D.
Institution: University of North Carolina
Chapel Hill, NC
Project Title: Center for Systems Neurogenetics of Addiction
Research: Basic Research
Research Area: Cocaine, Addiction, Genetics, Genomics, Behavior, Stress, Dopamine
Earliest Start Date: 6/4/2018
Housing: Campus

Student Qualifications: Our laboratory conducts basic research using animal models in the areas of neurobiology, behavior and genetics. A particular skillset is not required, but background in animal handling and basic laboratory techniques would be helpful. However, the student could and will be trained in these areas - therefore, no previous research experience is required - just an enthusiasm for science and a desire to learn and grow! Intern will be required to handle live laboratory mice including IP injections.

Project Description: Initial sensitivity to psychostimulants predicts future drug use and abuse in humans. In rodents, psychomotor stimulation in response to a drug is often used as a model for initial sensitivity and has a significant genetic component. Repeated exposure to psychostimulants increases locomotor response: a phenomenon known as behavioral sensitization that is thought to reflect neuroadaptations in the brain. The extent to which initial drug sensitivity and behavioral sensitization predict the rewarding and reinforcing properties of drugs in animal models is still being debated. The Tarantino laboratory is involved in the Center for Systems Neurogenetics of Addiction (CSNA); a large program project centered at The Jackson Laboratory and involving 4 institutions including UNC. The CSNA is studying the phenotypic and genetic relationship between animal models of addiction including locomotor sensitivity and sensitization, intravenous self-administration, and predisposing factors such as impulsivity and circadian behavior, with the end goal of identifying genes that contribute to addiction risk. The Tarantino laboratory has identified two strains of mice that show extreme locomotor responses to cocaine and differences in drug self-administration. The NIDA Summer Intern will help with behavioral (drug) testing of new strains of mice as well as further characterization of extreme strains including genetic mapping studies and candidate gene identification and testing.
Oregon

Investigator: John Harrelson, Ph.D.
Institution: Pacific University
Hillsboro, OR
Project Title: Novel Tobacco Cessation Agents
Research: Basic Research
Research Area: Drug discovery and design, nicotine addiction, toxicology, enzyme inhibitors, drug metabolism, protein purification, mass spectrometry, high performance liquid chromatography

Earliest Start Date: 5/18/2018
Housing: Campus

Student Qualifications: None Listed

Project Description: Individuals often respond to medication differently, therefore, it is helpful to have several options available to treat a specific disease. However, unlike many diseases for which there are numerous drug options to address these differences, there are only three drugs developed specifically for smoking addiction. Studies show that people who metabolize nicotine slowly smoke less and are able to quit more easily than people who metabolize nicotine quickly. We discovered that cinnamic aldehyde (a natural product from cinnamon) inhibits the human nicotine metabolizing enzyme. We are evaluating cinnamic aldehyde and related agents for the potential to serve as new smoking cessation agents. The work involves purifying the nicotine metabolizing enzyme and measuring how well the agents bind to it. We also evaluate how well the compounds inhibit the enzyme by measuring changes in nicotine metabolism in the presence of the inhibitors; we use fluorescent and mass spectrometric methods for this work. We are also evaluating these compounds for safety by investigating potential toxicological effects on human and mouse liver cells. The work at this phase of the project is being conducted using cell culture systems and subcellular organelles isolated from liver cells. In the near term our goal is to identify 2 or 3 lead compounds that are both potent inhibitors and reasonably safe. This will lay the foundation for animal studies and potentially clinical trials in the long term.
Oregon

Investigator: Tamara Richards, Ph.D.
Institution: Oregon Health & Science University
Portland, OR
Project Title: Genetic Risk for Methamphetamine Abuse
Research: Basic Research
Research Area: Methamphetamine, addiction, behavioral genetics, genetic risk, mouse;
Phrase: Understanding the genetic factors involved in susceptibility to drug addiction

Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: The intern should be working toward a bachelor’s degree in psychology, biology, neuroscience or related basic science. Helpful skills would be competency with MS Office; laboratory animal handling experience; the ability to work cooperatively in a group; the ability to efficiently perform detail-oriented tasks; familiarity with basic data analysis; flexible work schedule (specific hours of work on each day should be expected to be variable). Previous research experience is not a requirement.

Project Description: Answers to problems associated with excessive drug use are needed even after decades of study. Genetic and experiential factors play a role in individual differences in risk for drug use disorders and in response to treatment. For in-depth study, animal models of drug use and of sensitivity to drug-related effects that are thought to play important roles in addiction potential are used. Mice, in particular, are favored for genetic investigations, because they share considerable physiological and genetic homology with humans, and methods for genetic manipulation have been perfected in this species. A major current focus of research in the Richards’ laboratory is on genetic factors involved in susceptibility to methamphetamine addiction. Standard inbred strains of mice, recombinant inbred strains, and mice that have been selectively bred to voluntarily consume either high and low amounts of methamphetamine are utilized. In addition to studying methamphetamine intake, several other behaviors and physiological measures thought to be associated with risk for methamphetamine use are studied, and molecular genetic differences assessed. The main goal is to identify mechanisms that may lead to the development of more effective treatments. Through behavioral genetics research and discussion with Dr. Richards and other laboratory staff, the intern will gain a deeper understanding of the complexities of drug abuse research and how it translates to the human condition.
Oregon

Investigator: Elizabeth Skowron, Ph.D.
Institution: University of Oregon
Eugene, OR
Project Title: Targeting neurobiological & behavioral mechanisms of self-regulation in high-risk families
Research: Clinical Research
Earliest Start Date: 6/1/2018
Housing: Campus

Student Qualifications: We are looking for motivated students who are interested in pursuing careers in Psychology, Neuroscience, Medicine, or related fields. Interns will work directly with families while learning about structured biobehavioral assessments. We are looking for students that feel comfortable working in a professional and child friendly environment.

This internship would be a valuable experience for students who are interested in attending graduate school in the aforementioned fields.

Program Description: Child maltreatment (CM) is known to compromise children’s developing self-regulation skills and amplify risk for substance use and other regulatory disorders. Parents are implicated in more than 80% of CM cases involving physical abuse and neglect. Parent–Child Interaction Therapy (PCIT) has been shown to improve positive parenting and child behavior and reduce CM recurrence.

This randomized clinical trial is testing the effects of PCIT for child welfare–involved families and attempting to identify biobehavioral pathways to positive change in parenting practices and children’s self-regulatory outcomes. Families with children ages 3 to 7 years are recruited to participate in the evidence-based intervention.

As part of the PCIT experience parents interact with their child while a therapist coaches from behind a one way mirror. The therapist uses live camera feedback and interacts with the mother using an earpiece. This "real" time coaching allows the child to experience the mother as the agent of change. Families are assessed pre, post and at 1 year follow up. We use EEG equipment to assess brain activity and monitor autonomic physiology (RSA, PEP) while the parent and child perform cognitive, emotional, and behavioral challenge tasks both together and apart.
Oregon

Investigator: Elizabeth Stormshak, Ph.D.
Institution: University of Oregon
Eugene, OR
Project Title: Prevention of Substance Use in At-risk Students: A Family-centered Web Program
Research: Clinical Research
Research Area: longitudinal research, family relationships, early adolescence, prevention, Family Check-up, intervention
Earliest Start Date: 6/4/2018
Housing: Subsidized

Student Qualifications: Student intern will have direct contact with human subjects. Previous research experience is not required, although strongly preferred. Minimum Qualifications include: strong attention to detail; excellent organizational, written, and verbal communication skills; and a demonstrated ability to work as part of a team. Preferred Qualifications include: working towards BA/ BS degree in psychology, sociology, or related field; and experience working with families from diverse cultures.

Project Description: Over the past 20 years we have developed the Family Check-Up (FCU), a school-based, model-driven intervention that targets early adolescence, reduces problem behavior and substance use, and promotes successful transition into high school. It is designed to motivate parents to engage in positive parenting practices and to change problematic parenting. It has been shown to reduce substance use and antisocial behavior, depression, and teacher-reported risk behavior.

We are currently conducting several research studies involving the FCU; an intern could choose to participate in data collection/analysis for one or more projects. In one study, we are developing an internet version of the FCU for families of middle school youth and will examine the efficacy of this version in a sample of 300 families. We will examine the effect of the FCU-Online on parenting skills, positive youth adjustment, academic achievement, and reductions in youth problem behavior over the course of one year.

In another study, we are following up an existing community sample of 593 youth and families who were originally recruited at age 11 for the middle school FCU. Participating youth are now 22-23 years old. Families assigned to the original treatment condition were offered an additional intervention that targets parent–youth relationships during early adulthood, providing critical information about developmental changes in family processes that protect youth from substance abuse during this period.
Pennsylvania

Investigator: Anna Rose Childress, Ph.D.
Institution: University of Pennsylvania
Philadelphia, PA
Project Title: Targeting Dopamine D3 Receptors in Cocaine Addiction
Research: Clinical Research
Research Area: Psychiatry, Addictions, Behavioral Health
Earliest Start Date: 6/4/2018
Housing: Campus

Student Qualifications: Student should have a connected degree or interest in the behavioral sciences. Can be an interest in medicine or health care.

Project Description: The Program is an 8 week, 40 hours a week placement, supervised by a Principal investigator, and a designated program Director. The program will consist of introduction to addiction research including the understanding of clinical protocols and psychopharmacology, and includes the following:

- Psychiatry 105 coursework (Didactics); understanding of the Diagnosis and Treatment of Substance Abuse
- (2) Participation in science meetings - Weekly Speaker Sessions hosted by various investigators from the field and within the University
- (3) Data collection activities & data analysis
  Active research study preparation, including CRF work and Assessments (may include patient contact)
- (4) Laboratory experience/experiments (optional)
  includes animal research
- (5) Library research
- (6) Group activities includes mentor meetings and other group activities
- (7) Final Oral Presentations on topics or studies covered during the internship
Project Description: Relapse to drug use during abstinence is a major challenge in the treatment of drug addiction. Both human and animal studies show that relapse is often triggered and precipitated by cues previously associated with drug self-administration. Results from rodent models of drug relapse have implicated synaptic transmission from the basolateral amygdala (BLA) to the nucleus accumbens (NAc) in cue-induced cocaine seeking. The objective of this application is to explore how BLA-to-NAc synaptic transmission is re-organized following cocaine exposure and how this re-organization contributes to cue-induced cocaine seeking. Our published and preliminary results from the last funding period suggest that the BLA-to-NAc afferent undergoes a silent synapse-based re-organization and that interfering with this re-organization attenuates cue-induced cocaine seeking. Silent synapses are thought to be immature excitatory synaptic contacts that contain NMDAR receptors (NMDARs) without stable AMPA receptors (AMPARs). By recruiting/stabilizing AMPARs, these immature synapses develop into fully functional synapses, potentially resulting in new neural circuits. Thus, generation and maturation of silent synapses in the adult brain may represent a critical and profound process of synaptic and circuitry re-organization.
**Pennsylvania**

**Investigator:** Wenzhe Ho, M.D., M.P.H.  
**Institution:** Temple University  
**Project Title:** Methamphetamine, Innate Immunity and HIV  
**Research:** Other Research  
**Research Area:** Drug abuse, HCV/HIV, Neuro AIDS, Viral Immunology, Innate Immunity  
**Earliest Start Date:** 6/4/2018  
**Housing:** Subsidized

**Student Qualifications:** Prefer students with biology major, having a great interest in research (with or without experience, although research experience is preferred). Students should have attributes of paying attention to details, being a good listener, following instructions, getting along with others, and having ability to organize/present data. Students also have excellent communication skill, and can read and write in English.

**Project Description:** Dr. Ho’s laboratory is using multidisciplinary approaches to understand virus-host interactions and the basic mechanisms that control virus replication and strategies for enhancing the innate immunity against viral infections, particularly HIV and HCV (a major etiology of liver disease). Working closely with drug abusing populations in the regions of Philadelphia and China, the Ho laboratory is also investigating whether drugs of abuse such as heroin and methamphetamine have a cofactor role in promoting HIV and/or HCV diseases. Since HIV and/or HCV infection are frequently found in injection drug users (IDUs) and these two pathogens are likely to be responsible for the highest infectious disease morbidity and mortality rates among IDUs, Dr. Ho’s laboratory is investigating the role of drug abuse in the immunopathogenesis of HIV and/or HCV diseases. Dr. Ho and his research team use in vitro, ex vivo and in vivo models to directly address the question of whether drugs of abuse (opioids and methamphetamine) have the ability to suppress host immune responses and promote HIV and/or HCV diseases. In collaboration with the investigators from the University of Pennsylvania and Wuhan CDC, studies in the Ho’s laboratory have shown that drugs of abuse such as opioids and methamphetamine impair antiviral functions of host innate immune cells (natural killer cells and CD56+ natural T cells) and facilitate HIV or HCV infection/replication.
Rhode Island

Investigator: Sara Becker, Ph.D.
Institution: Brown Medical School Providence, RI
Project Title: Adolescents with Substance Use Disorders Transitioning from Residential Treatment to the Community: Improving Outcomes via a Computer Assisted Parenting Program
Research: Clinical Research
Research Area: adolescent; substance use; residential; technology
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: Previous research experience is not required. Interest in substance use, adolescence and/or parenting, and residential treatment preferred. Strong interpersonal skills, time management, and attention to detail required. Applicants with interest in applying to clinical-related graduate programs (e.g., social work, clinical psychology) are encouraged to apply. Opportunities to contribute to manuscripts or conference presentations could be available for students with strong writing skills.

Project Description: The summer intern will be assisting with a project evaluating a technology-assisted parenting program for parents of adolescents in residential substance use treatment. The technology-assisted parenting program consists of in-person coaching sessions, access to a computerized skills training program, and access to a smartphone app to promote networking with parents and with a clinical psychologist. Parents will be randomized to receive either standard residential care or standard residential care plus the technology-assisted program. The primary outcomes examined in the trial will be feasibility and acceptability of the new technology-assisted intervention. Secondary outcomes will include parental monitoring, parental communication, and adolescent substance use after discharge.
Rhode Island

Investigator: Anthony Spirito, Ph.D.
Institution: Brown Medical School
Providence, RI
Project Title: Computer-Assisted Brief Intervention Protocol for Marijuana Using Juvenile Offenders
Research: Clinical Research
Research Area: adolescents, juvenile justice, marijuana, brief computerized intervention
Earliest Start Date: 6/4/2018
Housing: Subsidized

Student Qualifications: At least one year of college; psychology major preferred; strong interpersonal skills required to interact with stressed families

Project Description: This application proposes to examine the feasibility and acceptability of integrating a computer-assisted, brief intervention protocol into the juvenile intake procedures at the Rhode Island Family Court (RIFC) for marijuana using adolescents and their parents. Following an open trial of the brief protocol, 80 adolescents who screen positive for marijuana use at juvenile intake will be recruited from the RIFC and randomly assigned to one of two conditions: 1) a computer-assisted adolescent MI plus an online parenting program; or 2) usual care. Outcomes will be examined at 3 and 6-month follow-ups.
South Carolina

Investigator: Lindsay Squeglia, Ph.D.
Institution: Medical University of South Carolina
Charleston, SC
Project Title: 13/13 ABCD-USA Consortium: Research Project
Research: Clinical Research
Research Area: neuroimaging, neuropsychology, child and adolescent brain development, alcohol, marijuana
Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: Preferred interest in clinical research with children and adolescents. No requirements on major or specific skill sets.

Project Description: The Adolescent Brain Cognitive Development (ABCD) study is a national longitudinal study that will assess the short- and long-term impact of substance use on brain development. The project will recruit 11,500 youths before they begin using alcohol, marijuana, tobacco and other drugs, and follow them over 10 years into early adulthood.
Investigator: Lisa McFadden, Ph.D.  
Institution: University of South Dakota  
Vermillion, SD  
Project Title: Serotonergic Changes in the Frontal Cortex During Methamphetamine Reinstatement  
Research: Drug Development Research  
Research Area: Addiction, Methamphetamine, Sex-Differences, Preclinical, Frontal Cortex  
Earliest Start Date: 5/7/2018  
Housing: Campus

Student Qualifications: This research will require students to work with animals and tissue samples. No research experience is required, but prior work experience is required. Work experience need not be in science, but rather any type of position that demonstrates the student’s maturity and work ethic. Research or career interests in neuroscience, behavioral pharmacology, or drug addiction/counseling is preferred. A criminal background check will be required.

Program Description: Methamphetamine is a highly addictive drug that results in a variety of negative consequences. One side effect of methamphetamine use is hallucinations. Understanding changes in the brain underlying these hallucinations will provide important insight into potential treatments for methamphetamine-associated hallucinations as well as hallucinations associated with other disorders. Previous research in our laboratory suggests changes in one area of the brain, the frontal cortex, may contribute to behaviors associated with hallucinations following the self-administration of methamphetamine in male and female rodents. Specifically changes in the neurotransmitter serotonin and its receptors in the frontal cortex may play a role in these hallucination-like behaviors. Efforts underway will investigate how these changes in serotonergic markers interact with other neurotransmitter systems to produce these behaviors. By targeting both serotonergic system as well as other interacting neurotransmitter systems more effective treatments for methamphetamine-associated hallucinations and hallucinations associated with other disorders can be developed.
Texas

Investigator: Donald Dougherty, Ph.D.
Institution: University of Texas San Antonio
San Antonio, TX
Project Title: Consequences of Substance Use on the Development of Impulse Control
Research: Behavioral Research
Research Area: Family History of Substance Use Disorder; Impulsivity; Sensation Seeking; Stress; Adolescent; Emerging Adulthood; Substance Initiation
Earliest Start Date: 5/1/2018
Housing: Subsidized

Student Qualifications: Previous research experience is not required. Background in psychology, sociology, or training in STEM field is preferred. This project is suitable for students with career interests in mental health, youth development, and substance use involvement.

Project Description: Parent Grant Title: Consequences of Substance Use on the Development of Impulse Control

A defining feature of healthy development is an increasing ability to control impulsive behavior. What cannot be determined from previous studies is whether poor impulse control contributes to, or is a result of, substance use involvement, and whether these factors interact in adolescence and yield increasingly negative outcomes by early adulthood. We are examining how specific components of impulse control develop and relate to substance use development. Importantly, we also test, refine, and extend the Dual Systems model of adolescent risk taking by addressing whether processes in the model are independent or interdependent, how they develop in non-normative samples to explain problematic patterns of substance use, and whether processes in the model are affected by social/environmental factors related to risk and resiliency.

This study tests bi-annually a cohort of youth with and without family histories of substance use. Parents and their children: (a) completed an initial assessment battery at study entry (self-report, interview, and laboratory-behavioral measures), and (b) have been re-assessed every 6 months to monitor changes in impulse control, substance use involvement, psychiatric status, family and environmental stressors, and physical maturation. Data collection include questionnaire, interview, and laboratory behavioral assessments.
Texas

Investigator: Laura O’Dell, Ph.D.
Institution: University of Texas at El Paso
El Paso, TX
Project Title: Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal
Research: Basic Research
Research Area: Neuroscience; Drug Abuse; Tobacco Use; Addiction; In Vivo Micro Dialysis; Behavior; Molecular Biology
Earliest Start Date: 5/25/2018
Housing: Campus

Student Qualifications: Biology or Chemistry Background; Physiological Psychology; Animal Handling experience; Preferably Graduate School bound; Interested in Neuroscience

Project Description: Summer students will be a part of our training program entitled, Summer Mentoring and Research Training: Methods in Neuroscience of Drug-Abuse (SMART MIND). This summer program consists of 8 undergraduate students from all over the country working in an intensive 11-week summer experience focused on neuroscience and drug abuse. In the O’Dell laboratory, summer student projects will emanate from the parent grant, entitled “Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal. The projects will examine sex differences to the behavioral effects of nicotine withdrawal. They will learn to integrate an array of behavioral procedures (place-conditioning, self-administration, anxiety-like behavior) with advanced neurochemical and molecular approaches. The student will present their work at the end of the summer at the local Summer Undergraduate Research Symposium. The students will be heavily involved in data collection and will learn valuable oral presentation skills. As part of the summer REU they will also receive training in bioethics and professional development skills. Our laboratory is based on strong student-mentor relationships, and we are dedicated to the success of a diverse range of students.
Texas

Investigator: Carlos Paladini, Ph.D.
Institution: University of Texas San Antonio
San Antonio, TX
Project Title: Mechanisms of Cocaine Hypersensitivity following Chronic DBH Inhibition
Research: Basic Research
Research Area: Dopamine, Addiction, Drug Abuse, Circuitry of Reward Behavior, Brain, Electrophysiology, and In Vivo
Earliest Start Date: 6/1/2018
Housing: Subsidized

Student Qualifications: No prior experience is required. The lab does use animals in experiments, so the student should be comfortable seeing animals euthanized and handling tissue.

Project Description: The neurotransmitter dopamine directs responses to natural rewards and pathological responses to drugs of abuse. The goal of this research is to determine how dopamine signaling and drug addiction is modulated by another related neurotransmitter, norepinephrine. This work may define new targets for the treatment of addiction.

Norepinephrine (NE) provides excitatory drive onto midbrain dopamine (DA) neurons and modulates responses to dopaminergic drugs, including psychostimulants. Chronic loss of noradrenergic tone impairs DA neuron firing and DA release, leading to compensatory alterations in postsynaptic DA receptor signaling and a paradoxical hypersensitivity to dopaminergic drugs. The goal of this proposal is to identify the molecular and cellular mechanisms underlying the behavioral hypersensitivity to cocaine following chronic inhibition of the NE biosynthetic enzyme, dopamine β-hydroxylase (DBH). Based on our preliminary data, we propose that a chronic loss of NE produces a decrease in β-arrestin2 (βArr2) in the nucleus accumbens (NAc), which promotes a reversal in the valence of D2 responses from inhibitory to excitatory, potentially via a Gαi-to-Gαs switch in D2 receptor coupling. Completion of these Specific Aims will contribute to our understanding of noradrenergic modulation of mesolimbic DA transmission, the plasticity of DA receptor signaling pathways, and NE-DA interactions underlying aversive responses to drugs of abuse.
**Virginia**

**Investigator:** Kim Blackwell, Ph.D.  
**Institution:** George Mason University  
Fairfax, VA  
**Project Title:** CRCNS: US-French Collaboration: Dopamine modulation of calcium in STDP  
**Research:** Basic Research  
**Research Area:** Striatum, Reward Learning, Calcium Dynamics, Computer Model  
**Earliest Start Date:** 5/29/2018  
**Housing:** Campus

**Student Qualifications:** No prior research experience is required. Research does not involve work with animals, humans or tissue samples. Required education and skills: completion of integral calculus, a cellular neuroscience course, and experience or course work in computer programming. Preferred skills include python programming and knowledge of the unix operating system.

**Project Description:** Drug use disorders (including alcohol abuse) are increasingly prevalent disorders with costly burdens to families and society. Both drug and alcohol addiction cause executive control of behavior to decline allowing compulsive, habitual use to increase, which hinders the ability to avoid drug use in the face of negative consequences. Synaptic plasticity in the striatum has been implicated in learning habitual behavior, both for normal habits and those related to drug and alcohol abuse; thus, understanding the mechanisms underlying synaptic plasticity could lead to development of novel treatments for addiction and relapse. Our approach is to create data-driven computer models of striatal neurons to investigate mechanisms of synaptic plasticity and how drugs or alcohol modify synaptic plasticity.
Virginia

Investigator: Wendy Lynch, Ph.D.
Institution: University of Virginia
Charlottesville, VA
Project Title: Dopaminergic and Glutamatergic Mechanisms of Cocaine Addiction: Sex Differences
Research: Basic Research
Research Area: Animal models, drug self-administration, sex differences, neurobiology of addiction
Earliest Start Date: 5/29/2018
Housing: Campus

Student Qualifications: Prior laboratory handling skills would be beneficial, but are not required. Students will need to undergo animal handler training prior to starting in the laboratory.

Project Description: Dr. Lynch’s laboratory uses rat models and a combination of behavioral, pharmacological, and molecular techniques to understand the neurobiological basis of addiction. They are particularly interested in determining the biological basis of sex differences in vulnerability to addiction. This work has shown that females are more vulnerable than males to the rewarding effects of drugs of abuse and develop addiction after less drug exposure than males. They are also interested in the development of exercise as a sex-specific treatment for addiction. In humans, exercise is a promising treatment for addiction that may reduce withdrawal symptoms and prevent relapse in both men and women.

This project will combine these two research areas by focusing on the potential for exercise to prevent the development of features of addiction in males versus females. The overall goals are to determine the exercise conditions necessary for inducing beneficial effects and to determine effects can be maximized.
Investigator: Barbara Sorg, Ph.D.
Institution: Washington State University
Vancouver, WA
Project Title: Perineuronal nets and cocaine-associated memories
Research: Basic Research
Research Area: Cocaine, Conditioned Place Preference, Reconsolidation, Memory
Earliest Start Date: 5/14/2018
Housing: Subsidized

Student Qualifications: Required: major in biomedical sciences. Preferred: interest in the field of neuroscience with some lab experience. Students will work with tissue samples, but they will not directly work with animals. They should not be allergic to rats, however.

Project Description: The student will work on my project that examines the influence of structures in the brain called perineuronal nets on memory. Specifically, cocaine exposure in rats creates memories that we believe drives relapse to cocaine in humans, and my lab focuses on how to diminish these memories in an effort to decrease the drive to seek and take cocaine in rat models of addiction.

The student would learn about animal models of addiction and be able to watch over others performing surgical techniques such as intravenous catheterization and intracranial cannula implantation (but they would not handle animals, as this takes some weeks of training). They would also learn how to slice rat brains and perform immunohistochemistry to identify changes in the brain. In addition, they would learn how to quantify these changes using an analysis program developed in my lab and how to make graphs and perform simple statistics of the results.
Wisconsin

Investigator: Paul Gasser, Ph.D.
Institution: Marquette University
Milwaukee, WI
Project Title: Glucocorticoid Regulation of Dopamine Clearance, Cocaine Seeking, and Reward
Research: Basic Research
Research Area: Addiction, Motivation, Reward, Cocaine, Stress, Corticosterone, Rat, Relapse, Dopamine, Nucleus Accumbens, Preclinical
Earliest Start Date: 5/25/2018
Housing: Campus

Student Qualification: Qualified students will be college students entering the sophomore, junior or senior year who have a strong interest in neuroscience and who are pursuing a degree in a biology-, neuroscience-, or psychology related field. Prior research experience is preferred but not required. Students must be willing to work with animals (rats and mice).

Project Description: The full-time 8-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. Paul Gasser at Marquette University in Milwaukee, WI and participation in the Marquette University College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The student's project will involve the use of preclinical rat models to investigate the neurobiological processes through which stressful stimuli can modulate motivation and reward processes and promote relapse to drug use. Specifically, mechanisms by which the stress hormone corticosterone modulates monoaminergic neurotransmission will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection mini-course. At the end of the 8-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.
Wisconsin

Investigator: John Mantsch, Ph.D.
Institution: Marquette University
Milwaukee, WI
Project Title: Glucocorticoid-regulated endocannabinoids and stress-potentiated cocaine seeking
Research: Basic Research
Research Area: Addiction, Cocaine, Stress, Corticosterone, Rat, Relapse, Endocannabinoid, Prefrontal Cortex, Preclinical
Earliest Start Date: 5/25/2018
Housing: Campus

Student Qualifications: Qualified students will be rising college sophomores, juniors or seniors with a strong interest in neuroscience and who are pursuing a degree in a biology-, neuroscience-, or psychology related field. Prior research experience is preferred but not required. Students must be willing to work with animals (rats and mice).

Program Description: The full-time 8-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. John Mantsch at Marquette University in Milwaukee, WI and participation in the Marquette College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The mentored project will involve the use of preclinical rat and mouse models to investigate the neurobiological processes through which stressful stimuli can promote relapse to drug use. More specifically, mechanisms in the prelimbic prefrontal cortex that control drug use during periods of stress will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection mini-course. At the end of the 8-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.
**Wisconsin**

**Investigator:** Lauren Papp, Ph.D.

**Institution:** University of Wisconsin-Madison

**Madison, WI**

**Project Title:** Real-Time Predictors of Prescription Drug Misuse by College Students and Assessment of Misuse on the Developmental Trajectories

**Research:** Behavioral Research

**Research Area:** Prescription Drug Abuse; Ecological Momentary Assessment; Interpersonal Relations; College; Stressor; Interpersonal Relations; Emotions; Development

**Earliest Start Date:** 6/1/2018

**Housing:** Campus

**Student Qualifications:** The research requires students to work with human participants. The research is relevant to students with interests or experience in psychology, human development, social work, public health, and counseling. Interns should be comfortable working with research staff and fellow students in a group environment. Dependability and thoroughness are valued traits. Previous research experience is desirable but not required. Completion of a research methods course is preferred.

**Program Description:** Personal and group characteristics that place some individuals at higher risk of engaging in prescription drug misuse compared to their peers have been established; however, among those who misuse, researchers have not systematically discovered in-the-moment antecedents of misuse behavior in real-world environments. Until we do so, society’s ability to prevent young adults—who display the highest misuse rates and experience increasingly costly health and well-being impacts—from misusing prescription drugs will likely remain beyond reach. Building on the team’s pilot work, 355 college students oversampled for elevated risk of prescription misuse will complete ecological momentary assessment (EMA) procedures for 28 days. The design consists of signal-based (scheduled across the day) and event-based (self-initiated) prompts. EMA will collect ratings of theoretically-driven contextual triggers and real-time prescription drug misuse in day-to-day environments. EMA and survey data will be collected during T1. Quantitative modeling will be employed to identify real-time predictors of prescription drug misuse in college students’ daily lives. Resulting contributions will be significant because a person-focused and contextual understanding of prescription drug misuse is expected to have broad translational importance in basic and applied fields.