

# National Institute on Drug Abuse Summer Research Internship Program

# 2019



### 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, 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 23<sup>rd</sup> year. Since the program's inception in 1997, more than 1160 students have gained experience in drug abuse and addiction research.

### Eligibility:

- This NIDA Summer Research Internship program is designed to train individuals from diverse backgrounds, including those from groups underrepresented in the biomedical, behavioral, clinical and social sciences research workforce, to conduct research and to prepare for careers in the biomedical, behavioral, clinical and social sciences such as individuals from racial and ethnic groups that have been shown by the NSF to be underrepresented in health-related sciences on a national basis (see data at <http://www.nsf.gov/statistics/showpub.cfm?TopID=2&SubID=27> and the report Women, Minorities, and Persons with Disabilities in Science and Engineering). The following racial and ethnic groups have been shown to be underrepresented in biomedical research: Blacks or African Americans, Hispanics or Latinos, American Indians or Alaska Natives, Native Hawaiians and other Pacific Islanders. In addition, it is recognized that underrepresentation can vary from setting to setting; individuals from racial or ethnic groups that can be demonstrated convincingly to be underrepresented by the grantee institution should be encouraged to participate in this program. For more information on racial and ethnic categories and definitions, see NOT-OD-15-089.
- Although this program is designed to enhance underrepresented populations in science, all racial/ethnic populations are eligible to apply.
- Applicants must be at least 18 years old by May 31, 2019 and must be U.S. citizens or permanent residents of the United States (No Exceptions).
- Graduating 2019 college seniors are also eligible to apply.
- 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)

**\*\*\*If unable to complete in one sitting, press SUBMIT and your entries will be saved. At any time prior to the application due date, you may access your application to enter updates/edits. To retrieve it, click on the link sent to the email address entered in the application and enter the token code included in the email. Complete/update the application and press SUBMIT. You last, most recent electronic submission will be the one recorded in the application system and used during the evaluation period.**

All application materials must be submitted by **11:59 pm EST, Monday, February 11, 2019.**

#### **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](mailto:huffmanj@mail.nih.gov) , phone 301-443-9798; or Albert Avila, Ph.D., [aavila@nida.nih.gov](mailto:aavila@nida.nih.gov).

2019 Summer Research with NIDA Site List by State

State	Research Institution	Project Title	Research Site Number	Housing Availability
Arizona	University of Arizona	Testing the Feasibility of a Novel Smoking Cessation Intervention by Timing Quit Dates and Menstrual Phase in a Quitline Setting	1	Campus
Arizona	Arizona State University	Cholinergic Modulation of Glutamatergic Signaling in Nicotine Addiction and Relapse	2	Subsidized
Arizona	Arizona State University	Keepin' it REAL in Mexico: An Adaptation and Multisite RCT	3	Campus
Arizona	University of Arizona	Development of a Selective Mu-Delta Opioid Receptor Heterodimer Antagonist Using a Linked Bivalent Pharmacophore	4	Campus
Arkansas	University of Arkansas for Medical Sciences	The Sex-Specific Roles and Neural Processing Correlates of Future-Oriented Estimation in the Drug Addiction Process	5	Campus
California	University of Southern California	Primary Role of Golgi Stress in Anti-HIV Drug and Alcohol-Induced Liver Injury	6	Campus
California	University of California, Irvine	Circulating miRNAs and Epigenetic Regulation in Nicotine Addiction	7	Subsidized
California	University of California, Irvine	ICAL: Impact of Cannabinoids Across Lifespan	8	Subsidized
California	University of California, San Diego	Characterizing Proviral Populations in Brain Tissues	9	Subsidized
California	University of California, San Diego	Epigenomic Approaches to Study the Gene Networks Underlying the Cannabis Effects on Genetic Vulnerability to Psychosis	10	Campus
California	Stanford University School of Medicine	Computational Methods for Identification of Genetic Factors Affecting the Response to Drug Abuse	11	Campus
California	University of California, San Francisco	Western States Node of the National Drug Abuse Treatment Clinical Trials Network	12	Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
California	California State University, Long Beach	Exploring Deterrents to Prescription Stimulant Diversion and Misuse-Related	13	Subsidized
California	David Geffen School of Medicine at UCLA	HIV Intervention Models for Criminal Justice Involved Black MSM Networks	14	Subsidized
California	The Scripps Research Institute	Identification of Genetic Variants that Contribute to Compulsive Cocaine Intake in Rats	15	Subsidized
California	University of California, Los Angeles	MSM and Substances Cohort at UCLA Linking Infections Noting Effects (mSTUDY)	16	Subsidized
California	Charles R. Drew University of Medicine & Science	CDU Diversity-Promoting Institutions Drug Abuse Research Development Program	17	Campus
California	University of California, Irvine	Prevention of Adolescent Risky Behaviors: Neural Markers of Intervention Effects	18	Subsidized
California	Stanford University	Thalamic Circuits Underlying Opioid Seeking	19	Campus
Colorado	University of Colorado Denver	Advancing STOP: Self-Regulation Therapy for Opioid Addiction and Pain	20	Campus
Colorado	University of Colorado Boulder	Enduring Enhancement of Neuropathic Pain by Early Post-Trauma Morphine	21	Campus
Connecticut	Southern Connecticut State University	Suburban Opioid Study	22	Campus
Connecticut	Wesleyan University	Dissecting Cortical Contributions to Risky Decision-Making	23	Campus
District of Columbia	Children's National Medical Center	Development of the Basal Telecephalic Limbic System	24	Subsidized
Florida	Torrey Pines Institute for Molecular Studies	Synthesis and In Vitro and In Vivo Screening of Fused and Tethered Heterocyclic Peptidomimetics for the Discovery of New Analgesics with Decreased Side Effects	25	Subsidized

State	Research Institution	Project Title	Research Site Number	Housing Availability
Florida	Florida State University	Neuron Subtype Specific Role of Methylcytosine dioxygenase TET1 in Cocaine Addiction	26	Subsidized
Florida	University of Florida	Identifying Patterns of Human Polysubstance Use to Guide Development of Rodent Models	27	Campus
Florida	University of Miami	Culturally Modified Family Based Therapy for Haitian Youth and Their Families in South Florida	28	Campus
Florida	Florida International University	Nano-Delivery of Methandamide Across BBB to Block Cannabinoid Induced Effects in HIV-1 Infection.	29	Subsidized
Florida	Florida International University	Aptamer-Based, Exonuclease-Amplified, Colorimetric, Onsite Screening of Methylendioxypropylvalerone (MDPV) and Mephedrone in Oral Fluid	30	Subsidized
Illinois	University of Illinois at Chicago	Contextual Risk Factors for Hepatitis C among Young Persons Who Inject Drugs	31	Subsidized
Illinois	Northwestern University Feinberg School of Medicine	Center for Prevention Implementation Methodology for Drug Abuse and HIV (Ce-PIM)	32	Campus
Illinois	Northwestern University	Netcanvas: Development, Hardening, and Dissemination of a software Suite for the Collection of Complex Network and Contextual Data in HIV and Drug	33	Subsidized
Illinois	University of Illinois-Urbana Champaign	Mechanisms of Metabolic and Cognitive Dysregulation after Combined Alcohol and THC Use	34	Campus
Illinois	Northwestern University	New Inactivators of GABA Aminotransferase for Addiction and Epilepsy	35	Campus
Indiana	Indiana University-Purdue University Indianapolis	Spinophilin Function in Regulating Pathological Responses to Psychostimulant Drug	36	Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Indiana	Indiana University School of Medicine	Neural Response to Risky Decision Making in Youth at High Risk for Substance Use Disorder and HIV	37	Campus
Iowa	University of Iowa	Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers	38	Campus
Kentucky	US WorkdMeds	Accelerated Development of Lofexidine for Neonatal Opioid Withdrawal Syndrome	39	Campus
Kentucky	University of Kentucky	Neural Microcircuit Selection by Astrocyte Signaling Following Cocaine Exposure	40	Campus
Maine	The Jackson Laboratory	Center for Systems Neurogenetics of Addiction	41	Campus
Maine	The Jackson Laboratory	Genetic Control of Addiction by Host and Microbiome	42	Campus
Maine	The Jackson Laboratory	Sequencing Mutant Mice with Altered Cocaine Responses	43	Campus
Maryland	Johns Hopkins University	Cocaine Use and HIV Antiretroviral Therapy Efficacy in CNS	44	Campus
Maryland	Uniformed Services University	Effects of Early Life Stress on Synaptic Function and DA Signaling in the VTA	45	Subsidized
Maryland	University of Maryland School of Medicine	Neurodevelopmental Effects of THC on the VTA Dopamine System and Behavior	46	Subsidized
Maryland	Emocha Mobile Health, Inc.	Development and Evaluation of Video-Based Directly Observed Therapy for Office-Based Treatment of Opioid Use Disorders with Buprenorphine	47	Subsidized
Massachusetts	Boston University School of Medicine	Bridging Genetic variation with Behavior: Molecular and Functional Mechanisms of Quantitative Trait Gene Regulation of the Stimulant and Addictive Properties of	48	Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Massachusetts	Harvard University	Precision Pharmacology of the Opioids	49	Subsidized
Massachusetts	Massachusetts General Hospital / Harvard Medical School	Effectiveness of a Smoking Cessation Algorithm Integrated into HIV Primary Care	50	Subsidized
Massachusetts	Tufts University	Morphine-Induced Changes in Sperm Epigenome	51	Subsidized
Massachusetts	Tufts University	Neuropeptides, Social Stress and Drugs of Abuse	52	Campus
Massachusetts	Massachusetts General Hospital	The Impact of Medicaid Plans on Access to and Quality of SUD Treatment	53	Subsidized
Massachusetts	Boston University	Engaging Working Memory and Distress Tolerance to Aid Smoking Cessation	54	Subsidized
Massachusetts	McLean Hospital	Behavioral Strategies to Reduce Stress Reactivity in Opioid Use Disorder	55	Subsidized
Massachusetts	Brigham and Women's Hospital	Development and Pilot Testing of a Persuasive Health Communication Intervention for Emergency Department Patients Who Decline Rapid HIV/HCV Screening	56	Subsidized
Michigan	Michigan State University	Neurobehavioral liabilities for substance use disorders	57	Subsidized
Michigan	Wayne State University School of Medicine	Effects of Cocaine Taking and Seeking on Histone Deacetylase Class IIa Enzyme Activity in the Nucleus Accumbens of Rats	58	Campus
Michigan	University of Michigan	Dynamic Control of Cue-Driven Behavior Via the Paraventricular Thalamic Nucleus	59	Campus
Minnesota	University of Minnesota	The Role of Dopamine in Modulation Relapse-Induced Transient Synaptic Plasticity	60	Campus
Missouri	Washington University	Dissecting Circuits Mediating Pain-Induced Alterations in Motivated Behavior	61	Subsidized



State	Research Institution	Project Title	Research Site Number	Housing Availability
Nebraska	University of Nebraska Medical Center	Optimization of Mrgx1 Allosteric Agonists as Potential Therapies for Chronic Pain	62	Subsidized
Nebraska	University of Nebraska Medical Center	Intranasal Delivery of Exosomes Loaded with MIRS-223 and -124 as a Therapeutic Strategy for Hand in Cocaine Users	63	Subsidized
Nebraska	University of Nebraska Medical Center	Extracellular Vesicles, Meth Relapse and Sex Differences	64	Campus
Nebraska	University of Nebraska Medical Center	Mechanisms Underlying Dysregulated Neuroimmune Signaling and Neuronal Dysfunction in HIV (+) Individuals Cart and Cocaine	65	Subsidized
Nebraska	University of Nebraska Medical Center	Role of Extracellular Vesicles in Methamphetamine Mediated Neurotoxicity	66	Campus
Nebraska	University of Nebraska Medical Center	Signatures of Cannabis Abuse in NeuroHIV (SCAN): An Integrated Molecular and Imaging Approach	67	Campus
New Hampshire	Dartmouth College	CRCNS Research Proposal: Cortico-Amygdalar Substrates of Adaptive Learning	68	Campus
New Hampshire	Yale University School of Medicine	Neuroscience of Marijuana Impaired Driving	69	Campus
New York	New York State Psychiatric Institute / Columbia University	Cognitive Control in Children of SUD Parents: A Longitudinal Multimodal MRI Study	70	Campus
New York	Icahn School of Medicine at Mount Sinai	Role of Neurotrophic Factors in the Actions of Drugs of Abuse	71	Subsidized
New York	Albert Einstein College of Medicine	Effect of Drugs of Abuse on CNS HIV-1 Reservoirs and Neuropathogenesis	72	Subsidized

State	Research Institution	Project Title	Research Site Number	Housing Availability
New York	National Development and Research Institutes, Inc.	Preventing Injection: An mHealth Intervention that Leverages Social Networks to Prevent Progression to Injection among Young Opioid	73	Subsidized
New York	New York University Langone Medical Center	Drug Use Among Nightclub and Dance Festival Attendees in New York City	74	Subsidized
New York	University at Buffalo	Fatty Acid Biding Protein _ Mediated Control of Endocannabinoid Signaling and Drug Addiction	75	Campus
New York	National Development and Research Institutes, Inc.	Staying Safe Intervention: Preventing HCV Among Youth Opioid Injectors	76	Subsidized
New York	Icahn School of Medicine at Mount Sinai	Computational and Neural Modeling of Cue Reactivity in Addiction	77	Campus
North Carolina	RTI International	Investigation of Synthetic Cannabinoid Exposures and Pharmacological Consequences	78	Subsidized
North Carolina	RTI International	Integrating Epigenomics in Human Brain and Genomics of Nicotine Dependence	79	Subsidized
North Carolina	University of North Carolina Chapel Hill	Incorporating the Social Context into Neurocognitive Models of Adolescent Risk Taking	80	Campus
North Carolina	University of North Carolina	Center for Systems Neurogenetics of Addiction	81	Campus
North Carolina	Wake Forest School of Medicine	RGS2 Regulation of D2 Receptor Signaling	82	Subsidized
North Carolina	University of North Carolina Chapel Hill	Technology Enhanced Behavioral Activation Treatment for Substance Use	83	Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Ohio	Case Western Reserve University	Identification of Immune Protective Pathways Dysregulated by Opioid Use in HIV Infection, Using a System Biology-Based Approach, Toward the Goal of Pharmacological Restoration of Immune Function	84	Campus
Ohio	University of Toledo	High Throughput Approaches to Determining the Lethality of Synthetic Psychoactive Cathinones Using Danio Rerio Larvae	85	Campus
Oregon	University of Oregon	Brief Substance Use Interventions in General Healthcare Settings: Understanding Variability in Effects Preventative Research	86	Campus
Pennsylvania	University of Pennsylvania	Targeting Dopamine D3 Receptors in Cocaine Addiction	87	Campus
Pennsylvania	University of Pittsburgh	Long-Term Activation of Spinal Opioid Analgesia After Inflammation	88	Campus
Pennsylvania	Temple University	Unraveling Epigenetic Mechanisms of Opioid Addiction Susceptibility Using Multigenerational Animal Models	89	Subsidized
Pennsylvania	University of Pennsylvania	Development of a Point-of-Care Volumetric Bar-Chart Chip for Drug Quantitation	90	Subsidized
Pennsylvania	Drexel University	Hypocretin/Orexin Regulation of Dopamine Signaling and Cocaine Reimbursement	91	Campus
Pennsylvania	The Lewis Katz School of Medicine at Temple University	Brain Endothelial EVS Role in the Neuropathology of Drugs of Abuse and HIV	92	Campus
Pennsylvania	Temple University	Role of miRNA in Methamphetamine/HIV-mediated Immune Activation	93	Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Rhode Island	Brown Medical School	Computer-Assisted Brief Intervention Protocol for Marijuana Using Juvenile Offenders	94	Subsidized
South Carolina	Medical University of South Carolina	Role and Regulation of Class IIa HDACs in Cocaine Addiction	95	Subsidized
South Carolina	Medical University of South Carolina	13/13 ABCD-USA Consortium: Research Project	96	Subsidized
Tennessee	University of Tennessee Health Science Center	Monocytic and Exosomal Cytochrome P450s in Smoking-Mediated HIV-1 Pathogenesis	97	Subsidized
Texas	University of North Texas Health Science Center	Astrocyte-TAAR1 & Meth in Hand	98	Subsidized
Texas	University of Texas Health Science Center at Houston	Gene-Environment Interactions in Cocaine Use Disorder: Collaborative Case- Control Initiative in Cocaine Addiction	99	Subsidized
Texas	University of Texas San Antonio	Development of Impulse Control	100	Subsidized
Texas	University of Texas Medical Branch	5-HT2CR Allosteric Modulators as Novel Pharmacotherapy in Cocaine Use Disorder	101	Campus
Texas	Texas Tech University Health Sciences Center	Mechanisms of Cannabinoid Tolerance	102	Campus
Texas	University of Texas Medical Branch	ELII: 5-HT2C Receptor Allosteric Modulators for Novel Pharmacotherapy	103	Campus
Texas	University of Texas Health Science Center at Houston	HIV Intervention Models for Criminal Justice Involved Substance-Using Black MSM	104	Subsidized
Texas	University of Texas at El Paso	SMART MINDS (Summer Mentoring and Research Training: Methods in Neuroscience of Drug	105	Campus
Texas	Houston Methodist Hospital	Development of a Point-of-Care Volumetric Bar-Chart Chip for Drug Quantitation	106	Subsidized

State	Research Institution	Project Title	Research Site Number	Housing Availability
Vermont	University of Vermont	ENIGMA-Addiction: Pooling of Existing Datasets to Identify Brain and Genetic Correlates of Addiction	107	Campus
Virginia	George Mason University	Role of Extracellular Vesicles in Methamphetamine and HIV Induced Neurotoxicity	108	Campus
Virginia	Virginia Commonwealth University	Using Mobile-Based Contingency Management to Promote Daily Self-Monitoring of Pain Severity and Prescription Opioid Use in a Primary Care Sample of Chronic Pain Patients	109	Subsidized
Virginia	Virginia Commonwealth University	Genetics Basis of Nicotine Withdrawal in a Reduced Complexity Cross	110	Subsidized
Virginia	University of Virginia	Exercise as a Sex-Specific Intervention Strategy for Cocaine Addiction	111	Campus
Washington	University of Washington	Preventing Addiction Related Suicide (PARS) – Controlled Trial of Secondary Suicide Prevention	112	Subsidized
Washington	University of Washington Alcohol & Drug Abuse Institute	Clinical Trials Network – Pacific Northwest Node	113	Campus
Washington	Washington State University, Pullman	Understanding Opioid Dependence and Hydrogen Sulfide	114	Campus
West Virginia	Joan C. Edwards School of Medicine at Marshall University	Characterization of Menthol's Effect of Nicotine Reinforcement and Nicotinic Receptor Neurobiology	115	Campus
West Virginia	West Virginia University	Reducing the Deleterious Effects of Synthetic Cannabinoid Withdrawal on Emotionality & Motivation	116	Campus
Wisconsin	University of Wisconsin-Madison	Real-Time Predictors of Prescription Drug Misuse by College Students and Assessment of Misuse on the Developmental Trajectories	117	Campus
Wisconsin	University of Wisconsin-Madison	Community-Based, Client-Centered Prevention Homes to Address the Rural Opioid Epidemic	118	Campus

# Arizona

**Investigator:** Alicia Allen, Ph.D.  
**Institution:** University of Arizona  
Tucson, AZ  
**Project Title:** Testing the Feasibility of a Novel Smoking Cessation  
Intervention by Timing Quit Dates to Menstrual Phase in a  
Quitline Setting  
**Research:** Clinical Research  
**Research Area:** Smoking Cessation; Addiction; Quitline; Menstrual Cycle;  
Sex Hormones; Women's Health  
**Earliest Start Date:** 5/14/2019  
**Housing:** Campus

**Student Qualifications:** We would prefer to be matched with intern(s) who are interested in pursuing careers in public health, psychology, medicine or similar. We are open to all levels of experience and all levels of education. Intern(s) will be working with human study participants, and with dried blood spot specimens. Intern(s) should have a high level of communication skills (e.g., in-person, over the phone, and via text/email), high attention to detail, be comfortable working with biological samples.

**Project Description:** The overall goal of this study is to examine how the menstrual cycle influences quit smoking outcomes in women who call Arizona's Smokers Helpline (ASHLine). In brief, we are enrolling women between the ages of 18 and 40 who want to quit smoking and who have regular menstrual cycles. Participants are randomized to either standard of care group (meaning they complete the ASHLine quit smoking counseling protocol as normal) or a follicular phase group (meaning we set their quit date during the follicular menstrual phase and the protocol is delayed 0-3 weeks to accommodate this). Participants receive 4 weeks of NRT patches and 6 weekly counseling sessions to help them quit smoking. They also complete weekly online surveys and self-collect dried blood spots so that we can measure their hormones (such as progesterone) and smoking-related biomarkers (such as nicotine). The intern(s) on this project will observe and/or participate in these activities. Further, intern(s) will pursue the development of an abstract on related topics (with mentor guidance); possible related topics include differences in smoking cessation outcome by hormonal contraceptive use, describing the use of e-cigarette use in study participants, describing the differences in withdrawal symptoms by menstrual phase, among others. Upon completion of the internship, intern(s) will present their results at Family and Community Medicine Grand Rounds, Cancer Prevention and Control Seminar, or similar.

# Arizona

**Investigator:** Cassandra Gipson-Reichardt, Ph.D.  
**Institution:** Arizona State University  
Tempe, AZ  
**Project Title:** Cholinergic Modulation of Glutamatergic Signaling in Nicotine Addiction and Relapse  
**Research:** Behavioral Research  
**Research Area:** Nicotine Addiction and Relapse, Glutamate Signaling, Acetylcholine, Synaptic Plasticity, Electrophysiology, Behavior  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Preferred qualifications include prior rodent handling experience, a biology, biochemistry, or psychology major, and a career interest of obtaining Ph.D. or M.D. Prior rodent handling experience is desired but not a requirement. Students will work with rats and will handle tissue.

**Project Description:** The goal of this project is to examine cholinergic interneurons (ChIs), a small population of cells (<1%) in the nucleus accumbens, which may have potentially outsized effects on nicotine-motivated behavior. These neurons express Cre, which is then targeted with a virus (specifically, a Cre-dependent Designer Receptors Exclusively Activated by Designer Drugs, or DREADD, virus). This allows for control of this specific cell type in the brain region that expresses the virus. The research project involves learning how to run rodent nicotine self-administration studies in transgenic (Cre is exclusively expressed in neurons with choline acetyltransferase, or ChAT) rats. These ChAT-Cre transgenic rats are bred on site, and offspring are genotyped to determine if they are Cre-positive. Rats will then be implanted with indwelling jugular catheters as well as infused with the virus in the nucleus accumbens using stereotaxic surgical techniques. Rats will undergo self-administration, extinction, and reinstatement sessions. Prior to reinstatement, which is a rodent model of nicotine relapse, rats will receive injections of clozapine-N-oxide to activate the DREADDs expressed in the ChIs. Of note, the specific viruses infused will either activate or inhibit ChIs. Reinstatement of nicotine seeking will be induced by nicotine-conditioned stimuli, and motivated nicotine seeking will be measured following activation or inhibition of ChIs.

# Arizona

**Investigator:** Flavio F. Marsiglia, Ph.D.  
**Institution:** Arizona State University  
 Phoenix, AZ  
**Project Title:** Keepin' it REAL in Mexico: An Adaptation and Multisite RCT  
**Research:** Behavioral Research  
**Research Area:** The Global Center for Applied Health Research has two research aims: 1. To increase international communities' capacity to apply science-based solutions to pressing health and social problems. 2. To conduct translational intervention research on adolescent substance abuse prevention and youth.  
**Earliest Start Date:** 5/20/2019  
**Housing:** Campus

## **Student Qualifications:**

- Fluent in English and Spanish desired;
- Majors in social work, social sciences, or public health;
- Career interests in adolescent substance use prevention and/or prevention intervention research;
- This internship will not be working with animal, human participants, or tissue samples.

This internship will be office-based. There will be no field or lab work as part of this internship.

**Project Description:** This summer research project will focus on youth substance use prevention in Mexico. In 2017-2018, a school-based substance use prevention program, Mantente REAL, was implemented to over 5,000 students across Mexico. Mantente REAL teaches youth a repertoire of drug resistance strategies—Refuse, Explain, Avoid, Leave [REAL]—and life skills. This study is also examining how changing gender role norms and rising violence may impact substance use among adolescents. In May 2019, the last round of surveys will be collected from these students. Knowledge generated from this study will be applicable globally to other emerging economies as it is being conducted with local partners in a rigorous and participatory fashion that can be replicable, feasible and sustainable in other contexts.



## Arizona

<b>Investigator:</b>	John Streicher, Ph.D.
<b>Institution:</b>	University of Arizona Tucson, AZ
<b>Project Title:</b>	Development of a Selective Mu-Delta Opioid Receptor Heterodimer Antagonist Using a Linked Bivalent Pharmacophore Approach
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Opioid; Pain; Signal Transduction; Heterodimer; G Protein Coupled Receptor; Drug Discovery; Drug Development; Signaling Regulators; Opioid Behavior
<b>Earliest Start Date:</b>	5/1/2019
<b>Housing:</b>	Campus

**Student Qualifications:** No prior research experience required. Previous research experience in mouse behavioral or molecular analysis (Western, CRISPR, qPCR, etc.) or the opioid field is a bonus. Previous coursework in biology is required, Cell Biology being the most important and relevant. No specific major is required if coursework has been taken. No specific career interests required. Interns will be required to work with mice.

**Project Description:** The Streicher Lab focuses on uncovering novel signal transduction mechanisms of the opioid receptors. This involves identifying novel regulators, and determining their molecular mechanisms, mostly through in vivo opioid pain and side effect models. The Streicher Lab then uses this novel signaling mechanisms to develop new profiles for drug discovery and development to create new analgesic drugs without the addictive and other side effect liabilities of opioids. The current project focuses on the mu-delta opioid receptor heterodimer (MDOR), which previous work has suggested acts as a negative feedback system to the opioid receptors, reducing analgesia and promoting side effects. We have developed a novel, first-in-class MDOR antagonist, and shown that this drug selectively blocks the MDOR in vivo, leading to enhanced analgesia and reduced opioid withdrawal. The intern summer project will focus on extended studies from these preliminary results, to identify molecular signaling mechanisms underlying the MDOR that promote these negative effects in vivo. This will involve administration of our MDOR antagonist to mice followed by opioid drugs like oxycodone in acute and chronic pain models. The behavior of the mice will be analyzed, and their molecular signaling in the brain and spinal cord analyzed by cutting edge methods including CRISPR gene editing, proteomic analysis, and similar.

# Arkansas

<b>Investigator:</b>	Clinton D. Kilts, Ph.D.
<b>Institution:</b>	University of Arkansas for Medical Sciences Little Rock, AR
<b>Project Title:</b>	The Sex-Specific Roles and Neural Processing Correlates of Future-Oriented Estimation in the Drug Addiction Process
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Individual and Sex Differences, Neuroimaging, Episodic Future Thinking, Addiction Risk Factors, Adolescence, Temporal Discounting, Attentional Bias Effect
<b>Earliest Start Date:</b>	5/31/2019
<b>Housing:</b>	Campus

**Student Qualifications:** Interns must have an interest in human neuroscience. Prior training in neuroscience, computer programming, or statistics is not necessary but preferred. Interns will interact with human participants and analyze data acquired from human populations, including questionnaires and neuroimaging data. Previous research experience is preferred but not required.

**Project Description:** The intern will be engaged in guided instruction and hands-on training related to the human drug addiction process in the Brain Imaging Research Center of the University of Arkansas for Medical Sciences. The research project will explore the role of future oriented thing in biasing decision making in the drug addiction processes across adolescence and adulthood. Interns would gain experience in structured assessments, functional magnetic resonance imaging, and the use of tasks as processing demands for episodic future thinking, drug incentive motivation, and the temporal discounting of future gains or losses, as well as human neurodevelopment. Experience extensions into the area of resilience, computational modeling, coding, real-time fMRI, and adverse childhood experience mapping and outcomes are additionally possible. There will be opportunities to interact and learn with the medical students, graduate students, postdoctoral fellows and psychiatry residents currently participating as trainees in the UAMS NIDA T32 training program ("Translational Training in Addiction"). The intern will work with the mentor to develop a project tailored to his or her research interests.

# California

**Investigator:** Cheng Ji, PhD  
**Institution:** University of Southern California  
Los Angeles, CA  
**Project Title:** Primary Role of Golgi Stress in Anti-HIV Drug and Alcohol-Induced Liver Injury  
**Research:** Basic Research  
**Research Area:** Drug and Alcohol Abuse, Organelle Stress, Liver Injury Mechanism  
**Earliest Start Date:** 5/15/2019  
**Housing:** Campus

**Student Qualifications:** College students in molecular cell biology; Basic routine laboratory skills in protein, RNA, and DNA sampling and analysis; Willing to work with rodent animals; Confocal imaging of cell and tissues;

**Project Description:** Organelles in mammalian cells include endoplasmic reticulum, Golgi apparatus, mitochondria, lysosome, and nucleus. We found anti-HIV drug and/or alcohol abuse induces organelle stresses. We are studying molecular mechanisms by which the cellular organelle stresses lead to cell death and inflammation, contributing to tissue/organ injuries and disease development.

# California

**Investigator:** Christie Fowler, PhD  
**Institution:** University of California, Irvine  
Irvine, CA  
**Project Title:** Circulating miRNAs and Epigenetic Regulation in Nicotine Addiction  
**Research:** Basic Research  
**Research Area:** Drug Addiction; Nicotine; Self-Administration; Extracellular Vesicles; Exosomes; RNA; Epigenetics; Genetics  
**Earliest Start Date:** 5/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Background in biology, neuroscience or related field preferred. Prior experience in handling rats or mice (preferred, not required). Must be willing to work with animals, cell culture, and tissue samples. Career interests to pursue graduate studies in drug addiction and/or neuroscience.

**Project 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 during drug self-administration.

# California

**Investigator:** Daniele Piomelli, Ph.D.  
**Institution:** University of California, Irvine  
Irvine, CA  
**Project Title:** ICAL: Impact of Cannabinoids Across Lifespan  
**Research:** Basic Research  
**Research Area:** The long-term Consequences of Adolescent Exposure to Cannabinoid Drugs on Brain Plasticity and Behavior and the Molecular Mechanisms Underlying Such Effects.  
**Earliest Start Date:** 6/24/2019  
**Housing:** Subsidized

**Student Qualifications:** Previous experience in a biomedical, neuroscience, molecular or cellular biological research laboratory is required. Preferred skills are handling rodents, tissue isolation, and protein/DNA/RNA/lipid biochemistry. High levels of motivation for Science, work ethics, organization, and responsibility are required.

**Project Description:** Adolescent administration of  $\Delta^9$ -tetrahydrocannabinol (THC) causes long-lasting neurobehavioral impairments in mice and rats. The project will test the hypothesis that these enduring effects result from excessive activation of CB1-type cannabinoid receptor (CB1R), which triggers epigenetic processes resulting in region- and circuit-specific down-regulation of endocannabinoid (ECB) signaling.

We will examine whether acute or prolonged exposure to THC during adolescence alters molecular components of the ECB system, and/or the ability of this system to be engaged by environmental stimuli. We will test, in mice and rats of both sexes, acute and prolonged THC regimens designed to mimic occasional or daily cannabis use in teenagers. We will determine the effects of acute or prolonged adolescent THC exposure on (i) lipid, protein and gene constituents of the ECB complex; (ii) epigenetic modifications; and (iii) stimulus-dependent ECB signaling in vitro and in vivo. A deep understanding of the enduring actions of THC at the genetic, epigenetic and biochemical level will guide the future discovery of predictive biomarkers of exposure outcomes as well as for the rational development of medications aimed at correcting the neurobehavioral consequences of teenage cannabis use.

# California

**Investigator:** Davey Smith, M.D.  
**Institution:** University of California, San Diego  
San Diego, CA  
**Project Title:** Characterizing Proviral Populations in Brain Tissues  
**Research:** Basic Research  
**Research Area:** HIV Cure, Neurocognition, Reservoir  
**Earliest Start Date:** 5/14/2018  
**Housing:** Subsidized

**Student Qualifications:** Desired qualifications in order of importance include: desire to learn about research, interest in helping people with HIV, willingness to work hard, and reliable. Mentees will not work with animals but will work with tissues obtained from people with HIV.

**Project Description:** The project is designed to develop and validate methods to measure HIV from brain tissue from people with HIV. Mentees will work closely with post-doc fellows and senior lab technicians to learn basic lab techniques and sophisticated digital droplet PCR and next generation sequencing. Mentees will also learn how to analyze generated data.

# California

**Investigator:** Francesca Telese, Ph.D.  
**Institution:** University of California, San Diego  
San Diego, CA  
**Project Title:** Epigenomic Approaches to Study the Gene Networks  
Underlying the Cannabis Effects on Genetic Vulnerability to  
Psychosis  
**Research:** Basic Research  
**Research Area:** Epigenetic Mechanisms Underlying Cell-Type Specific Gene  
Expression in the Brain. Molecular Effects of Drugs of  
Abuse in the Adolescent Brain Epigenomics,  
Transcriptomics, Animal Models  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Students will be required to work with tissue samples or mice. Basic knowledge of neurobiology and molecular biology are preferred. Bioinformatic skills are a welcome.

**Project Description:** Adolescence represents a critical time window of neurodevelopment during which the brain undergoes critical changes at the behavioral, cellular and molecular level. The adolescent brain is highly responsive to the environment and this plasticity might lend to this period of development a greater vulnerability to external insults, such as drugs of abuse. In my laboratory, we investigate the effects of cannabis abuse in the adolescent brain using novel mice models that permit the analysis of cell-specific epigenetic pathways.

# California

**Investigator:** Gary Peltz, M.D.  
**Institution:** Stanford University School of Medicine  
Stanford, CA  
**Project Title:** Computational Methods for Identification of Genetic Factors Affecting the Response to Drug Abuse  
**Research:** Basic Research  
**Research Area:** Genetics, Computational Methods, Mouse Genome (CRISPR) Engineering  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** We develop computational methods that will enable genetic factors affecting many biomedical traits to be discovered and experimentally characterized. A computational method will be used to analyze 213,000 responses in inbred mouse strains. These tools will be used to analyze 15 responses of inbred strains to cocaine, methamphetamine, fentanyl, and nicotine. We use a high efficiency method for engineering allelic changes into the mouse genome to analyze the effect of these genetic factors.

**Project Description:** The interns will: 1) help to develop computational methods for analysis of genetic and genomic data; or 2) aid engineering the genome of mice using CRISPR to produce lines that can be tested for response to drugs of abuse.



# 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:** Substance Use, Public Health, Treatment and Services  
**Earliest Start Date:** 5/28/2019  
**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.

**Project Description:** Summer interns will gain exposure to the application of substance abuse research methods in real world treatment settings. Ongoing research projects include a study investigating the safety and effectiveness of a combination pharmacotherapy for methamphetamine use disorder and a study examining the use of and preferences for digital health applications for HIV and HCV prevention and treatment among individuals with opioid use disorders. NIDA summer interns participate in UCSF Summer Research Training Program (SRTTP), which consists of social and academic events with other summer interns at UCSF. The SRTTP offers seminars to prepare students to become more competitive candidates for graduate education including panel discussions about the graduate school application process, life as a graduate student, and career options for researchers, as well as skill-building workshops focusing on abstract writing, oral presentation skills, and how to create effective poster presentations. Students also participate in a weekly journal club where they present a journal article relevant to their summer research project and lead a group discussion about the material, and a substance abuse seminar.

## California

**Investigator:** Niloofar Bavarian, Ph.D.  
**Institution:** California State University, Long Beach  
Long Beach, CA  
**Project Title:** Exploring Deterrents to Prescription Stimulant Diversion  
and Misuse-Related  
**Research:** Behavioral Research  
**Research Area:** Prescription Stimulant Misuse; Prescription Stimulant  
Diversion  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** General Eligibility Criteria: Interest in prescription stimulant misuse research; Motivated to learn; Punctual; Dependable; Ethical; Detail-Oriented.

Skills: Qualitative data experience; Quantitative data experience; Experience in Microsoft Office.

Education: Courses in research methods and statistics are preferable.

Major: Open

Career Interests: Open

\*Although our research involves human participants, the summer intern will not interact directly with participants

**Project Description:** Research team seeks a summer intern to assist with study examining prescription stimulant misuse and diversion. An intern for the summer 2019 period may help with transcribing, analyzing and interpreting results. A separate, quantitative, data set can be made available for interns seeking to pursue their own research questions. Arrangements may also be made for intern to participate in NIH-funded BUILD program during summer.

# California

**Investigator:** Nina T. Harawa, M.P.H., Ph.D.  
**Institution:** David Geffen School of Medicine at UCLA  
Los Angeles, CA  
**Project Title:** HIV Intervention Models for Criminal Justice Involved Black MSM Networks  
**Research:** Epidemiology Research  
**Research Area:** Criminal Justice, Incarceration, HIV, Opioids, Homosexuality, Bisexuality, MSM, Modeling, HIV Prevention, HIV Treatment, HIV Pre-Exposure Prophylaxis  
Diversion  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** Educational majors may include public health, sociology, anthropology, and biomed (interested in students who have completed at least their sophomore year of college). Students will work with data collected from humans. Experience with data entry, qualitative coding, data management, and/or conducting health-related interviews preferred. Particularly interested in students who are motivated to address racial health disparities and/or those with interests in LGBTQ health.

**Project Description:** Students will participate in a range of activities related to this study, including coding of qualitative data, review of qualitative transcripts for accuracy, data entry, study meetings, literature reviews, and assistance with manuscripts and presentations.

# 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:** Clinical Research  
**Research Area:** Cocaine, Addiction, Dependence, Stress, Reward  
**Earliest Start Date:** 5/14/2019  
**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.

**Project 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:** Steven Shoptaw, Ph.D.  
**Institution:** University of California, Los Angeles  
Los Angeles, CA  
**Project Title:** MSM and Substances Cohort at UCLA Linking Infections  
Noting Effects (mSTUDY)  
**Research:** Clinical Research  
**Research Area:** Addiction and HIV  
**Earliest Start Date:** 6/2/2019  
**Housing:** Subsidized

**Student Qualifications:** This internship is particularly suited to an undergraduate studying medicine, psychology, community health science, public health or a similar field. Candidates should be entering junior or senior year. Completion of a statistics course is helpful, but not required. The intern will not be working directly with research subjects, but will be exposed to a variety of clinical research projects and will visit clinics conducting this research.

**Project Description:** The UCLA Center for Behavioral & Addiction Medicine is a multidisciplinary center that seeks to advance the prevention and treatment of chronic illnesses, especially in communities with health disparities. We work at the intersection of academia and community with a focus on treating addiction and preventing the spread of HIV. People who use substances are at much greater risk of acquiring HIV and for those with HIV, use of substances hinders viral suppression (a key measure of health for those with HIV). The intern will work closely with faculty, staff and postdoctoral fellows to gain a general understanding of addiction and how it affects (and is affected by) other medical, behavioral, and social conditions.

# California

<b>Investigator:</b>	Theodore Friedman, M.D., Ph.D.
<b>Institution:</b>	Charles R. Drew University of Medicine & Science Los Angeles, CA
<b>Project Title:</b>	CDU Diversity-promoting Institutions Drug Abuse Research Development Program
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Smoking; Nicotine; Insulin Resistance; Obesity; Diabetes; Drug Addiction; Fatty Liver Disease; Electronic Cigarettes
<b>Earliest Start Date:</b>	5/16/2019
<b>Housing:</b>	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 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

<b>Investigator:</b>	Uma Rao, Ph.D.
<b>Institution:</b>	University of California, Irvine Irvine, CA
<b>Project Title:</b>	Prevention of Adolescent Risky Behaviors: Neural Markers of Intervention Effects
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Child, Adolescent, Life Skills, Risky Behavior, MRI, Ethnicity/Race, African-American.
<b>Earliest Start Date:</b>	6/3/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** This is a clinical research project involving interaction with human research subjects. Certification in human subject's protection and Good Clinical Practices (GCP) is critical for observing the research assessments. NIH sponsored certification is acceptable. Obtaining the training prior to joining the internship will facilitate better use of the 8-week program. Students should have a background in psychology, public health, biological sciences, psychobiology, neuroscience, or related fields.

**Project Description:** Adolescents face many challenges as they begin to gain independence and prepare for adult roles in society. Due to covert and overt racial discrimination in our society, Black (African-American) youth experience more challenges during this transition. The investigator's research team has developed a culturally-sensitive family intervention program, Pathways for African American Success (PAAS), which helps youth and parents to cope with such challenges. This 6-week parent-child program has been shown to be effective in promoting positive outcomes in later adolescence and young adulthood. In the current project, 11-14-year-old Black (African-American) youth (both boys and girls) are recruited. Using magnetic resonance imaging (MRI) technology, brain scans are performed before and after PAAS to learn more about the brain changes associated with positive outcomes in response to the PAAS program. A better understanding of the brain network changes will help us to fine-tune the program or develop alternative strategies for those who don't show significant benefit.

# California

**Investigator:** Xiaoke Chen, Ph.D.  
**Institution:** Stanford University  
Stanford, CA  
**Project Title:** Thalamic Circuits Underlying Opioid Seeking  
**Research:** Basic Research  
**Research Area:** Opioid, Memory, Circuits/Examining Circuitry Mechanism  
Underlying Opioid-Associated Memories  
**Earliest Start Date:** 6/17/2019  
**Housing:** Campus

**Student Qualifications:** The intern needs to have some experiences working with mice, and a strong interest in neuroscience. Experience in stereotaxic surgery will be ideal.

**Project Description:** We will combine optogenetic pathway manipulation and morphine-conditioned place preference assay to dissect the contribution of each output pathway from the paraventricular nucleus of the thalamus to opioid-associated memory.



# Colorado

**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:** 6/1/2019  
**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.

**Project 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.

## Colorado

**Investigator:** Linda R. Watkins, Ph.D.  
**Institution:** University of Colorado Boulder  
 Boulder, CO  
**Project Title:** Enduring Enhancement of Neuropathic Pain by Early Post-Trauma Morphine  
**Research:** Basic Research  
**Research Area:** Neuropathic Pain; Transition from Acute to Chronic Pain; Morphine; Opioids; Glial Priming; Pro Inflammatory Cytokines; Dorsal Root Ganglia; Spinal Cord; Nerve Injury  
**Earliest Start Date:** 4/30/2019  
**Housing:** Campus

**Student Qualifications:** The work involves living rats and rat tissues. Experience with animals, cell culture, protein and mRNA analyses, behavior, tissue collections, and/or surgery are a plus. Sustained attention to detail, high motivation to master new procedures, ability to work well both alone and in a group, are all essential. Knowledge that you are not allergic to rats is a plus. Prefer students who have biology/neuroscience background.

**Project Description:** Opioids are widely used to treat pain after trauma. Opioid use for pain management has dramatically increased, with little assessment of potential negative consequences for ongoing pain. Recent reports are critical of the lack of controlled, long-term studies to support the dramatic escalation of opioid treatment for chronic pain over the past decade. While one long-term concern is that there may be no benefit, another is that opioids could have negative consequences for pain. There would be major implications were opioid treatment to prolong the course of pain long after opioid cessation. Robust opioid-induced prolongation of pain does indeed occur, making this a phenomenon critical to understand.

Disturbingly, we have discovered that opioids given around the time of trauma may be contraindicated: a brief course morphine can amplify the magnitude and duration of neuropathic pain for months thereafter. Strikingly, this deleterious opioid effect occurs in both males and females, and across all models tested to date: inflammatory pain, peripheral and central neuropathic pain, and post-operative pain, supportive that this is a widespread phenomenon worthy of study. This unanticipated effect of morphine across time and diverse pain models had not been previously reported. Beyond our initial studies, nothing is known regarding the mechanistic underpinnings of this multi-month exaggeration of neuropathic pain by a brief exposure to morphine restricted to early post-trauma.

## Connecticut

<b>Investigator:</b>	Aukje Lamonica, Ph.D.
<b>Institution:</b>	Southern Connecticut State University Fairfield, CT
<b>Project Title:</b>	Suburban Opioid Study
<b>Research:</b>	Behavioral Research
<b>Research Area:</b>	Opioid research, Ethnographic Research, Qualitative Research, Substance Abuse Research, Suburban Opioid Use
<b>Earliest Start Date:</b>	5/30/2018
<b>Housing:</b>	Campus

**Student Qualifications:** Seeking enthusiastic and self-motivated undergraduate student to join the PI's ethnographic research team. Position is open to undergraduates enrolled in a social science program (public health, social work, psychology, nursing, sociology, or a closely related field), who are seeking training and experience in an ethnographic research setting. Intern needs excellent communication and organizational skills. Data management experience a plus.

**Project Description:** Epidemiological data show a dramatic increase in opioid and heroin use, largely due to nonmedical use of opioid prescription medications. In this project, the PIs conduct a qualitative study that triangulates ethnographic field research and in-depth interviews conducted in three suburban field sites that differ by size, location, and demographics. The final sample will consist of 180 opioid and/or heroin users living in suburban communities of Boston, MA (N=60), New Haven, CT (N=60), and Atlanta, GA (N=60). The specific research goals of this suburban research study are (1) to examine opioid and heroin use initiation, trajectories, settings, situations, and risk practices; and (2) to compare opioid and heroin use patterns by race, ethnicity, and gender. The PIs and their teams examine all opioid and heroin use transitions including shifts from medical-to-nonmedical opioid use; opioid-to-heroin use; heroin-to-opioid use, and other patterns that emerge. The summer research project focuses on the New Haven site. Here the intern will be introduced to all aspects of ethnographic fieldwork which includes recruitment and data collection activities with the assistance of the PI. Further, the intern learns how to quality control the collected interviews and analyze the data. Helping prepare conference presentations and manuscripts is also part of the intern experience.

## Connecticut

**Investigator:** Mike Robinson, Ph.D.  
**Institution:** Wesleyan University  
Middletown, CT.  
**Project Title:** Dissecting Cortical Contributions to Risky Decision-Making  
**Research:** Behavioral Research  
**Research Area:** Behavioral Neuroscience; Addiction; Risky Decision-Making;  
Animal Research; Optogenetics  
**Earliest Start Date:** 5/29/2019  
**Housing:** Campus

**Student Qualifications:** Required qualifications: expected to demonstrate an eagerness to learn new skills and concepts, ethical/compassionate treatment of research animals, and ability to work in a collaborative team environment. Preferred qualifications: previous general lab experience, particularly animal research experience; experience reading/analyzing/discussing/writing scientific research publications; current or prospective Neuroscience & Behavior major; interest in pursuing graduate education in the field.

**Project Description:** Research in the Robinson lab investigates the brain mechanisms underlying motivation and reward and how they come together to produce desire and risky decision-making. A current project uses a variety of behavioral and optogenetic techniques in a rodent model to assess how two cortical brain regions (anterior insula and orbitofrontal cortex) are involved in making or influencing risky choices. This is achieved by inhibiting activity in these two cortical regions during discrete moments during the decision-making process (e.g. during deliberation or choice outcomes). Investigating the underlying mechanisms of this complex cognitive process, and what happens when these mechanisms go awry, has important implications for understanding the mechanisms involved in addictions, such as drug and gambling disorder.

## 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.

## Florida

**Investigator:** Adel Nefzi, Ph.D.  
**Institution:** Torrey Pines Institute for Molecular Studies  
Saint Lucie, FL  
**Project Title:** Synthesis and In Vitro and In Vivo Screening of Fused and Tethered Heterocyclic Peptidomimetics for the Discovery of New Analgesics with Decreased Side Effects  
**Research:** Drug Development Research  
**Research Area:** Synthesis, Combinatorial Chemistry, Analgesics, Opioid Receptors, Drug Discovery  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Mature and eager to learn.

**Project Description:** The summer intern will be trained in the combinatorial chemistry techniques and parallel synthesis of a variety of heterocyclic peptidomimetics.

## Florida

**Investigator:** Jian Feng, Ph.D.  
**Institution:** Florida State University  
Tallahassee, FL  
**Project Title:** Neuron Subtype Specific Role of DNA Methylcytosine  
Dioxygenase TET1 in Cocaine Addiction  
**Research:** Basic Research  
**Research Area:** Cocaine, Addiction, Epigenetics, DNA Methylation, Mouse  
**Earliest Start Date:** 5/20/2019  
**Housing:** Subsidized

**Student Qualifications:** Prior mouse handling or basic molecular biology experience is preferred.

**Project Description:** We propose to study the DNA epigenetic mechanism in drug addiction with a focus on TET1, a newly discovered methylated DNA dioxygenase that leads to DNA demethylation. We plan to elucidate the functional role of TET1 and its mediated DNA methylation turnover in the two major neuronal subtypes of the ventral striatum, the center of the brain reward pathway. Our study will not only elucidate a novel molecular mechanism of drug addiction within specific neuron types that are differentially engaged in drug addiction, but will also provide a plausible path for therapeutic manipulation of addiction behavior through DNA methylation editing.

## Florida

**Investigator:** Linda B. Cottler, Ph.D., M.P.H.  
**Institution:** University of Florida  
Gainesville, FL  
**Project Title:** Identifying Patterns of Human Polysubstance Use to Guide  
Development of Rodent Models  
**Research:** Epidemiology Research  
**Research Area:** Adolescent Substance Use, Community-Based Research,  
Recruitment and Retention  
**Earliest Start Date:** 5/13/2019  
**Housing:** Campus

**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 interns must be dedicated, reliable, curious, independent, solution-oriented, have good attention to detail, and a desire to learn about substance abuse research.

**Project 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 2019 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

**Investigator:** Louis HERN Marcelin, Ph.D.  
**Institution:** University of Miami  
Miami, FL  
**Project Title:** Culturally Modified Family Based Therapy for Haitian Youth and Their Families in South Florida  
**Research:** Preventative Research  
**Research Area:** Family-based therapy, Psychoeducational Therapy, Haitian Youth, Juvenile Justice System, Miami-Dade, South-Florida, Acculturation Process, Instrumentation.  
**Earliest Start Date:** 6/10/2019  
**Housing:** Campus

**Student Qualifications:** Interns must have prior experience with ethnography and ethnographic analysis. Skills in ethnography will be critical for the intern to be able to conduct observation of clinical settings, description of clinical cultural contexts, and mapping of clinical settings in the neighborhoods studied. Interns should also have prior experience with in-depth interviews with young people age 13 through 17. Writing skills is a must for fieldnotes and analysis.

**Project Description:** The project will train the interns to apply ethnographic skills in clinical settings where family-based and psychoeducational therapies are delivered to young offenders in diversion programs.

# Florida

<b>Investigator:</b>	Madhavan Nair, Ph.D.
<b>Institution:</b>	Florida International University Miami, FL
<b>Project Title:</b>	Nano-delivery of Methandanimide across BBB to Block Cannabinoid Induced Effects in HIV-1 Infection
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Nanotechnology; HIV and Drug Abuse
<b>Earliest Start Date:</b>	5/1/2019
<b>Housing:</b>	Subsidized

**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.

**Project 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 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.

## Florida

**Investigator:** Yi Xiao, Ph.D.  
**Institution:** Florida International University  
Miami, FL  
**Project Title:** Aptamer-Based, Exonuclease-Amplified, Colorimetric, Onsite Screening of Methylenedioxypropylvalerone (MDPV) and Mephedrone in Oral Fluid  
**Research:** Basic Research  
**Research Area:** Aptamer; Biosensor; Drug detection; Electrochemical; Sensor; THC.  
**Earliest Start Date:** 5/20/2019  
**Housing:** Subsidized

**Student Qualifications:** I prefer for the interns to have chemistry and biochemistry background.

**Project Description:** Electrochemical aptamer-based (E-AB) sensors have great potential for on-site small-molecule detection due to their sensitivity, specificity, ease of use, portability, and robust performance in complex samples. Sensitive detection of targets using E-AB sensors requires structure-switching aptamers, which undergo large conformational changes upon target binding. We will utilize our previously-reported exonuclease-based method to adopt structure-switching functionality into the aptamer that bind THC. We will perform exonuclease III digestion of THC-binding aptamer (46-nt in length) in the presence and absence of THC. Exonuclease digestion of both aptamers in the presence of target will be halted several nucleotides prior to the target-binding domain, yielding a major product with structure-switching functionality. Isothermal titration calorimetry experiments will be used to determine target-binding affinity. Moreover, circular dichroism experiments will be used to confirm that the exonuclease-truncated aptamer will perform target-induced conformational change. Finally, we will use these aptamers to fabricate THC-detecting E-AB sensors.

## Illinois

**Investigator:** Basmattee Boodram, Ph.D.  
**Institution:** University of Illinois at Chicago  
Chicago, IL  
**Project Title:** Contextual Risk Factors for Hepatitis C among Young  
Persons Who Inject Drugs  
**Research:** Epidemiology Research  
**Research Area:** Persons who Inject Drugs, Injection Drug Use, Social  
Networks, Social Geography, Stigma, Norms, Hepatitis C,  
HIV, Heroin Use  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** Trained in the social or health sciences., with a strong inclination toward working with marginalized populations.

**Project Description:** This is a longitudinal study of 420 young persons who inject drugs (PWID) and 1,156 of their drug injection network partners to examine the role of social networks (injection, sexual, and support), social geography, social norms related to drug use and sexual behaviors, and drug use stigma on (a) hepatitis C risk and adverse drug use outcomes (e.g. overdose).

## Illinois

<b>Investigator:</b>	C. Hendricks Brown, Ph.D.
<b>Institution:</b>	Northwestern University Feinberg School of Medicine, Chicago, IL
<b>Project Title:</b>	Center for Prevention Implementation Methodology for Drug Abuse and HIV (Ce-PIM)
<b>Research:</b>	Preventative Research
<b>Research Area:</b>	Implementation Science, Implementation Methods, Systems Science, Methodology Development, HIV Prevention, HIV Treatment, Drug Abuse Prevention, Health Equity
<b>Earliest Start Date:</b>	6/3/2019
<b>Housing:</b>	Campus

**Student Qualifications:** Young adult (18 years old or older) that lives in the Chicago-land area, Passionate about learning about drug abuse prevention and/or HIV prevention, interested in learning how to conduct research.

**Project Description:** The Center for Prevention Implementation Methodology for Drug Abuse and HIV (Ce-PIM) aims to develop, disseminate, and apply innovative and rigorous implementation methods for researchers, policy makers, and practitioners to improve population health, especially in HIV and drug abuse prevention. We pay special attention to addressing disparities by developing methods that improve the health of minorities and underserved communities. Many of the methods use systems science and engineering and advanced computational tools to address the complex interactions involved in implementation.

Ce-PIM identifies and responds to critical methods gaps that are holding back the movement of numerous rigorously evaluated prevention programs involving biomedical interventions for preventing HIV that have demonstrated impact in efficacy and effectiveness trials. Ce-PIM has partnered with 5 qualifying grants to support the next stage of implementation science research. The qualifying grant at Northwestern University is the NIDA funded U01 RADAR research project (full grant title “Multilevel Influences on HIV and Substance Use in a YMSM Cohort”). Led by Dr. Brian Mustanski, the overall goal of the RADAR study is to identify and understand the connections among sexually transmitted infections (like HIV), drug and alcohol use, and romantic or sexual relationship patterns over time among young men who have sex with men (YMSM).

## Illinois

<b>Investigator:</b>	Michelle Burkett, Ph.D.
<b>Institution:</b>	Northwestern University Chicago, IL
<b>Project Title:</b>	Netcanvas: Development, Hardening, and Dissemination of a Software Suite for the Collection of Complex Network and Contextual Data in HIV and Drug Research
<b>Research:</b>	Other Research
<b>Research Area:</b>	Social Network Analysis; Public Health; HIV; STIs; Infectious Disease; Sexual and Gender Minorities; Substance Use; Multilevel Influence; Network Data; Data Collection; Social and Behavioral Health; Prevention; Population Dynamics; Community Outreach; Software; Social Stigma; Surveys.
<b>Earliest Start Date:</b>	6/24/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** Knowledge or interest in health disparities research, LGBTQ+ populations, HIV/infectious disease, public health, and/or community outreach and dissemination. Detail-oriented with strong written and oral communication skills. Majors in social sciences (e.g. sociology, psychology), public health or related field preferred. Basic computer proficiency required, and interest in software development a plus. Student should be comfortable engaging members of the public in a professional capacity.

**Project Description:** Network Canvas is a project of Northwestern University's Institute for Sexual and Gender Minority Health and Wellbeing. The five-year project aims to develop a standalone software suite to simplify the collection and management of complex network data and, once stable, widely disseminate this tool to the research community. Capturing data "beyond" the individual (e.g. social, relational, geospatial) is a growing priority for many researchers, particularly those concerned with understanding the complex drivers of health and disease in marginalized populations. However, existing survey tools for collecting these data are often cumbersome, resource intensive and require strong technical expertise. Through a free, open-source framework, the Network Canvas suite leverages advanced technologies to allow researchers to easily design bespoke surveys, collect rich multilevel data directly from participants using intuitive touchscreen interfaces, and utilize these data in near real-time to assess associations between contextual factors and health outcomes.

The intern will work on feedback and outreach activities to help hone the tool's functionality and foster uptake across the research community during the public beta period. They will assist with the production of high-quality training materials, catalog and summarize incoming feedback, support manuscript preparation, and work directly with researchers interested in implementing Network Canvas in their studies.

## Illinois

**Investigator:** Nu-Chu Liang, Ph.D.  
**Institution:** University of Illinois-Urbana Champaign  
Champaign, IL  
**Project Title:** Mechanisms of Metabolic and Cognitive Dysregulation  
after Combined Alcohol and THC Use  
**Research:** Clinical Research  
**Research Area:** Alcohol, Cannabis, THC, Cognitive Function, Energy  
Balance, Adolescence, Polydrug Use  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Preferred attributes include a general interest in the neuroscience of abused drugs, feeding (e.g., overeating and binge drinking), adolescence, drug-induced neuroadaptation, and cognitive functioning. Majors in psychology and other neuroscience-related fields are preferred, as are students who are highly motivated, very attentive to details, and work well in a team environment. Students should expect to handle live, free behaving rats and process blood and tissue samples.

**Project Description:** Dr. Liang's laboratory studies the neurobiological and behavioral consequences of repeated exposure to psychoactive drugs such alcohol and cannabis. In addition, the laboratory aims to study mechanisms underlying injunctive behaviors and factors that can impair or improve energy balance. Examples of the research questions currently being addressed in the lab are: (1) Do alcohol and cannabis co-use produce worse neural and behavioral outcomes than the use of either drug alone? (2) Are there more adverse consequences when drug exposure occurs early in life and are there age-dependent differences in drug-induced neuroadaptations? (3) What are the neurobiological mechanisms or pharmacokinetics that underlie individual differences in voluntary alcohol and cannabis consumption? (4) Does exercise affect voluntary alcohol and THC intake and related neural and behavioral outcomes? Dr. Liang collaborates with Dr. Joshua Gulley to investigate these questions. Thus, students will have opportunity interact with the Gulley laboratory during the summer internship.

## Illinois

**Investigator:** Richard Silverman, Ph.D.  
**Institution:** Northwestern University  
Chicago, IL  
**Project Title:** New Inactivators of GABA Aminotransferase for Addiction and Epilepsy  
**Research:** Basic Research  
**Research Area:** Enzyme Inactivation, GABA Aminotransferase, Medicinal Chemistry, Organic Synthesis  
**Earliest Start Date:** 5/31/2019  
**Housing:** Campus

**Student Qualifications:** The only education requirement is a full year of organic chemistry with laboratory. Preference will be given to students interested in pursuing chemistry as a career. No work will involve animals, humans, or tissue samples. This will involve chemical reactions with some dangerous chemicals.

**Project Description:** Addiction is known to be caused by the release of dopamine in the brain, which binds to a receptor that produces a reward sensation. It is known that the inhibitory neurotransmitter GABA (gamma-aminobutyric acid) can antagonize the dopamine release, thereby acting to prevent the reward sensation and addiction. The enzyme called GABA aminotransferase degrades GABA. Therefore, if you block GABA aminotransferase, GABA cannot be degraded, and its concentration will rise. This should lead to prevention of addiction. You will be required to carry out chemical synthesis of an organic molecule that has been designed to inactivate the enzyme GABA aminotransferase. If the molecule is synthesized, you can then study whether it inhibits GABA aminotransferase. If this occurs, and it is potent, the molecule will be sent to a collaborator to carry out addiction studies in rodents.



# Indiana

**Investigator:** A.J. Baucum, Ph.D.  
**Institution:** Indiana University-Purdue University Indianapolis  
Indianapolis, IN  
**Project Title:** Spinophilin Function in Regulating Pathological Responses  
to Psychostimulant Drug  
**Research:** Basic Research  
**Research Area:** Signal Transduction, Psychostimulants, Phosphatases,  
Electrophysiology, Behavior.  
**Earliest Start Date:** 6/3/2019  
**Housing:** Campus

**Student Qualifications:** A strong passion or openness to learning new techniques and approaches. Interest in neuroscience. Students will work with animals and animal tissues as well as human and rodent cell lines.

**Project Description:** The project will entail understanding how a specific protein in the brain called spinophilin affects brain biochemistry, physiology, and animal behavior in a model of amphetamine abuse or obsessive-compulsive disorder. To understand the role of this protein in psychostimulant abuse, animal models with and without this protein will be used and their brain chemistry and physiology and their motor behaviors will be compared.

# Indiana

**Investigator:** Leslie Hulvershorn, M.D.  
**Institution:** Indiana University School of Medicine  
Indianapolis, IN  
**Project Title:** Neural Response to Risky Decision Making in Youth at High Risk for  
Substance Use Disorder and HIV  
**Research:** Clinical Research  
**Research Area:** Brain Imaging, Substance Use Disorder, Risky Decisions, Behavioral  
Issues  
**Earliest Start Date:** 5/15/2019  
**Housing:** Campus

**Student Qualifications:** Interns must be detail-oriented and willing to learn new skills. Students with an interest in medicine, psychology, psychiatry, social services, or other biological sciences would be well-suited for this project. Student interns must be comfortable working with adolescent participants and participant families.

**Project Description:** Interns will assist in an observational study looking at risky behaviors in middle to late adolescents. This project investigates brain mechanisms in high and typical risk youth that underlie decision-making, prior to the effects of drug use on their brain. Interns will have the opportunity to shadow clinicians in a multi-disciplinary team treating adolescents with substance abuse and behavioral health disorders.

## Iowa

<b>Investigator:</b>	Lane Strathearn, Ph.D.
<b>Institution:</b>	University of Iowa Iowa City, IA
<b>Project Title:</b>	Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Maternal; Oxytocin; Dopamine; Reward; Mother-Infant Synchrony; Functional MRI; Development
<b>Earliest Start Date:</b>	5/22/2019
<b>Housing:</b>	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.

**Project 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.

## Kentucky

**Investigator:** Kristen Gullo  
**Institution:** US WorldMeds  
Louisville, KY  
**Project Title:** Accelerated Development of Lofexidine for Neonatal Opioid Withdrawal Syndrome  
**Research:** Drug Development Research  
**Research Area:** Neonatal Opioid Withdrawal Syndrome; Neonatal Abstinence Syndrome; Pediatric Formulation Development; Clinical Trial Material Manufacturing; Nonclinical Toxicology and Pharmacology; Clinical Pharmacology, Bioavailability Study, Pharmacokinetics, Analytical, Bioassay, Regulatory  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Preferred candidates will have educational background in a relevant scientific or math/stats field (chemistry, chemical engineering, biology, biochemistry). Some exposure to basic or clinical research and/or a regulated environment a plus, but not required. Desired skills/attributes include: analytical thinking, strong written and verbal communication, team player mentality, and a passion to help patients. Interns will have no direct contact with animals, human subjects or tissues.

**Project Description:** US WorldMeds is developing a non-opioid product for the treatment of Neonatal Opioid Withdrawal Syndrome (NOWS). In this early stage of drug development, three critical components of research are in progress: nonclinical safety and pharmacology studies to inform safety margins for the treatment of neonates, formulation development to support the particular dosing needs of neonates, and the conduct of a Phase 1 study in adult volunteers to characterize the pharmacokinetics of the neonate formulation prior to evaluating the drug in the target population. Intern(s) will be placed with mentors responsible for the executional oversight of one or more of these development program components. The intern will participate in a number of activities to learn about drug development requirements, assist with documents, perform literature reviews, compile resources and/or data required for program decisions, support vendor communications and compliance oversight, tabulate and trend data, support internal cross-functional meetings to align research activities across stakeholders, and provide organizational and/or writing assistance with regulatory communications required under an Investigational New Drug Application.

# Kentucky

**Investigator:** Pavel Ortinski, Ph.D.  
**Institution:** University of Kentucky  
Lexington, KY  
**Project Title:** Neural Microcircuit Selection by Astrocyte Signaling  
Following Cocaine Exposure  
**Research:** Basic Research  
**Research Area:** Substance Use Disorders; Drug Addiction; Electrophysiology  
Cocaine Self-Administration; Neuron; Astrocyte; Glia  
Synapse Circuit  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** No prior training is required but individuals interested in pursuing graduate education in neuroscience area are particularly encouraged to apply. The project will involve daily animal handling and training. Students will also observe animal surgeries but will not be required to perform them.

**Project Description:** Our lab studies how drugs of abuse change brain activity at the cellular level and how such changes may perpetuate the desire to use the drug. We use rodents (mostly rats) that self-administer cocaine as a model of human drug use. Cocaine-triggered changes are examined in the brains of these animals using electrophysiological recordings, imaging of Ca<sup>2+</sup> activity, and a variety of biochemical methods. This research project will ask a question whether astrocyte signals contribute to drug use when it is associated with negative consequences (mild electric shock). Human drug addicts often maintain drug use despite severe negative consequences such as impact on relationships, job loss, etc. Although neuronal activity is known to be altered following drug exposure, it is not understood how astrocytes, another major cell type in the brain, may contribute to such alterations. We hope to begin probing for answers in this project.

# 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:** 6/2/2019  
**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 can learn genetics and genomics through analysis of behavioral data. Students with computational experience including statistical data analysis using R, or significant python coding can contribute readily to data analysis and software development.

**Project 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:** Jason Bubier, Ph.D.  
**Institution:** The Jackson Laboratory  
Bar Harbor, ME  
**Project Title:** Genetic Control of Addiction by Host and Microbiome  
**Research:** Basic Research  
**Research Area:** Systems Genetics, Microbiome, Heterogeneous Data  
Integration, Behavior, Mouse Genetics  
**Earliest Start Date:** 6/2/2019  
**Housing:** Campus

**Student Qualifications:** The student should have a biological science or related major. They should be interested in graduate school MD/PhD programs, however a desire for a career as a scientist with a bachelor's degree is also sufficient. The student may have no previous research experience and computer programming experience is a plus. This research could include work with animals.

**Project Description:** Evidence from both human and animal studies indicates that a multitude of traits, including novelty seeking, novelty preference, and impulsivity are strongly correlated with the propensity to develop a substance use disorder. We are utilizing the Diversity Outbred (DO) mouse population, an advanced mouse genetic population and the computational and statistical methods in systems genetics developed to analyze these populations, to identify the genomic region associated with these behaviors. Accumulating evidence suggests that the gut microbiome plays a significant role in behavioral response to cocaine, as well as anxiety- and depression-like behaviors, many of which are co-morbid with addiction. In this study, we aim to reveal an integrated genetic basis of addiction that combines host genetics and the microbiome composition.

## 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:** genetic and genomic methods to discover new genes and pathways that regulate addiction.  
**Earliest Start Date:** 6/4/2018  
**Housing:** Campus

**Student Qualifications:** Background in biology, with emphasis on genetics is preferred. Computational experience is not required and will be taught.

**Project Description:** There are several projects depending on the intern's interests that are in line with the overarching goals of the lab - to understand the functioning of the mesolimbic reward circuit at a molecular level. These can be highly computational, such as computer vision projects that analyze mouse behaviors using artificial intelligence methods and computational genomic methods to analyze "omics" data. We also have behavioral projects to look at drug response in mouse models. Interns with broad expertise and interest who are interested in studying the problem of drug addiction are encouraged to apply.



# Maryland

**Investigator:** Dionna Williams, Ph.D.  
**Institution:** Johns Hopkins University  
Baltimore, MD  
**Project Title:** Cocaine Use and HIV Antiretroviral Therapy Efficacy in the CNS  
**Research:** Basic Research  
**Research Area:** HIV, Drug Metabolism, Cognitive Impairment  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** This research requires students to work with blood and/or immune cells obtained from HIV infected people. Outstanding aseptic technique and comfort working in a BSL2/3 laboratory is required. RNA and DNA isolations will be performed. qPCR, sequencing, and statistical analyses will be the primary experimental approaches. Appropriate majors include biology, chemistry, biochemistry, immunology, neuroscience, microbiology, genetics, or related disciplines.

**Project Description:** Human immunodeficiency virus-1 (HIV) enters the brain early after infection and results in a spectrum of neurologic deficits that affect cognitive processes like learning and memory, termed HIV associated neurocognitive disorders (HAND). Antiretroviral therapy (ART) are the therapies used to treat HIV. While successful in reducing HIV to undetectable levels in the blood, ART does not successfully reduce HIV in the brain to the same extent. As a result, ART has not decreased the prevalence of HAND, which continues to increase as the life expectancy for infected individuals increases. HIV-infected substance abusers exhibit more severe cognitive impairment compared with their non-drug abusing counterparts. Specifically, cocaine use is associated with an accelerated incidence and progression of HAND. This occurs, in part, due to cocaine-mediated alterations in the metabolism of ART that inhibits the ability of the therapies to work effectively at reducing HIV in brain. CYP3A4 is a cytochrome P450 family member and is responsible for metabolizing over 50% of clinically used drugs, including ART. CYP3A4 also contributes to the metabolism of cocaine. The goal of this project is to determine whether CYP3A4 expression 1) differs for HIV-infected substance abusers, as compared to non-drug abusing infected people, and 2) contributes to the risk of developing HAND specifically in HIV-infected substance abusers.

# Maryland

**Investigator:** Fereshteh Nugent, Ph.D.  
**Institution:** Uniformed Services University  
Baltimore, 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:** 6/1/2019  
**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.

# Maryland

**Investigator:** Joseph Cheer, Ph.D.  
**Institution:** University of Maryland School of Medicine  
Bethesda, MD  
**Project Title:** Neurodevelopmental Effects of THC on the VTA Dopamine System and Behavior  
**Research:** Basic Research  
**Research Area:** Marijuana, Dopamine, Cannabinoids, Ventral Tegmental Area, Nucleus Accumbens, Addiction, Impulsivity, Cues, Prenatal  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Biology, chemistry, psychology. MatLab experience highly desirable...

**Project Description:** Marijuana is the most common illicit drug used by pregnant women. Clinical studies on the long-term effects of marijuana smoking during pregnancy show its detrimental impact on the cognitive development of the offspring from early childhood until later in life. In fact, children and adolescents exposed to the psychoactive ingredient of marijuana,  $\Delta 9$ -tetrahydrocannabinol (THC), before birth display reduced attention, learning and problem solving, hyperactivity, increased impulsivity and engagement in risk-taking behaviors. Hence, early exposure to THC might induce enduring adaptations encompassing the brain reward dopamine (DA) system resulting in maladaptive behavior, ranging from affective dysregulation to addiction vulnerability. However, preclinical studies on the impact of marijuana use on the development of brain reward pathways are surprisingly lacking. Hence, there is an urgent need to identify molecular substrates and effective strategies for prevention and treatment of these detrimental effects that might confer individual vulnerability. Here, we propose three experiments to test our overarching hypothesis that prenatal THC exposure induces a strengthening at afferent excitatory synapses on ventral tegmental area (VTA) DA neurons, which together with abnormal endocannabinoid (ECB) system function, induces a persistent excitatory drive to DA neurons underlying an at-risk phenotype for alcohol seeking. First, we will determine if prenatal THC exposure leads to strength.

# Maryland

**Investigator:** Sebastian Seiguer, J.D.  
**Institution:** emocha Mobile Health, Inc.  
 Owings Mills, MD  
**Project Title:** Development and Evaluation of Video-Based Directly Observed Therapy for Office- Based Treatment of Opioid Use Disorders with Buprenorphine  
**Research:** Behavioral Research  
**Research Area:** Opioid Use Disorder (OUD), Buprenorphine, Medication Adherence, Mobile Health  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Describe for best fit with senior emocha team member and project: 1) academic, professional, or practical experience: software design and development, systems design (e.g. data science, informatics), or public health research, 2) relevant interests: socio-behavioral research, OUD, medication adherence, or mobile technology to address clinical public health problems. Interns will access and analyze systems that collect and maintain personal health information. HIPAA training will be provided.

**Project Descriptions:** emocha Mobile Health Inc. ([www.emocha.com](http://www.emocha.com)) is a technology start-up in Baltimore, MD dedicated to developing high-impact, public health software applications. The emocha app enables over 35 U.S. public health departments to deliver asynchronous, secure, video Directly Observed Therapy services to their patients on tuberculosis treatment. The technology is expanding to other use cases, including buprenorphine adherence to treat opioid use disorder. The patient-facing mobile app is used to record videos of medication ingestion, to record symptoms and side effects. The provider-facing web portal is the platform to review videos for compliance to regimen and review dose-by-dose adherence data. Under the NIDA R44 award, the emocha team supports a pilot randomized clinical trial on the app for adherence to buprenorphine treatment in Seattle and Boston. We also work with scientists at Johns Hopkins to address issues of adherence to treatment and verification of abstinence under a CDC R01. emocha moves quickly to assess new use cases, features, markets, and the players in each space to address a critical clinical or public health challenge. The intern will be paired with an emocha staff scientist, social design expert, product manager, or engineer. Responsibilities may include reviewing scientific and grey literature in support of projects and proposals, developing databases, and conducting discrete analyses of emocha platform data.

# Massachusetts

<b>Investigator:</b>	Camron Bryant, Ph.D.
<b>Institution:</b>	Boston University School of Medicine Boston, MA
<b>Project Title:</b>	Bridging Genetic variation with Behavior: Molecular and Functional Mechanisms of Quantitative Trait Gene Regulation of the Stimulant and Addictive Properties of Methamphetamine in Mice
<b>Research:</b>	Basic Research
<b>Research Area:</b>	QTL; Behavioral Genetics; Opioid; Withdrawal; Reward; Conditioned Place Preference; Anxiety; Elevated Plus Maze; RNA-Seq; Transcriptome; Gene Expression; Naloxone; Naltrexone; Conditioned Place Aversion; Addiction Liability; Spliceome; Splice Variants; Binge Eating; Food Addiction; Reward; Translational Genetics; Reinforcement; Intermediate Phenotype; Systems Genetics; eQTL; QTL; GWAS; Genome-wide; Gene Editing; Genome Editing; CRISPR; RNA Binding Protein; RBP; CLIP; Self-Administration; ICSS; Intracranial Self-Stimulation; Substance Use Disorders; Neonatal Abstinence Syndrome
<b>Earliest Start Date:</b>	6/1/2019
<b>Housing:</b>	Campus

**Student Qualifications:** Basic knowledge of molecular biology and/or experience in the statistical software environment Rare 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:** Christina Woo, Ph.D.  
**Institution:** Harvard University  
Boston, MA  
**Project Title:** Precision Pharmacology of the Opioids  
**Research:** Basic Research  
**Research Area:** Chemistry, Chemical Biology, Mass Spectrometry,  
Proteomics, Chemical Proteomics  
**Earliest Start Date:** 5/20/2019  
**Housing:** Subsidized

**Student Qualifications:** Background or exposure to organic chemistry, tissue culture, Western blot, or proteomics. Majors typically come from chemistry, biochemistry, or molecular biology. Some prior lab experience a plus. No work with animals or humans.

**Program Description:** Substance abuse behaviors result from molecular changes to gene expression programs in neurons over time. The addictive nature of morphine and heroin, unlike natural opioid peptides, may result from their cell permeability and thus direct influence on gene expression programs. To probe the broader interactions of the opioids in the cell, we are developing chemical tools for visualizing and detecting the opioids in biological systems. We will create and validate a series of “click-opioids” and “photo-opioids” as probes to track opioid mechanisms in cell culture and mouse model systems of addiction. These probes may be coupled to various reporter strategies for fluorescent imaging, chemical proteomics, or chemical genomics. We employed these probes within a mass spectrometry-based binding site hotspot mapping platform to characterize the direct and indirect interactions of the opioids in the cellular proteome. The strategy involves: (1) treatment of cells with the opioid probe, (2) isolation of the resulting global molecular binding sites, and (3) confident mass spectrometry-based assignment of the opioid conjugated to the protein target. We discovered several novel binding sites to the cellular proteome, including extracellular and intracellular membrane proteins and proteins involved in gene regulation.

# Massachusetts

**Investigator:** Conall O'Cleirigh, Ph.D.  
**Institution:** Massachusetts General Hospital/Harvard Medical School  
Boston, MA  
**Project Title:** Effectiveness of a Smoking Cessation Algorithm Integrated  
into HIV Primary Care  
**Research:** Behavioral Research  
**Research Area:** Smoking Cessation; HIV; Implementation Science;  
Substance Use Treatment Research  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** We welcome applications from Interns with interests in pursuing graduate studies in clinical psychology, public health/epidemiology, or medical school and who have an interest in one or more of the following:

1. learning about substance use treatment or prevention research
2. learning about the intersection of substance use and chronic disease
3. learning about clinical intervention research to support substance use treatment and prevention outcomes

**Program Description:** The NIDA Summer Research Intern at Massachusetts General Hospital/Harvard Medical School will take place at the Behavioral Medicine Program in the Department of Psychiatry and at the Fenway Institute, Fenway Health Boston. The Intern will be part of a research team comprised of clinical psychologists, psychiatrists, clinical social workers, and physicians, many of who are currently funded NIDA investigators. The NIDA Summer Intern will work principally with the Principal Investigator on a current smoking cessation program but will also have the opportunity to work on other NIDA projects. The NIDA Summer Intern will learn many of the priorities of clinical intervention science, research operations including data collection and management, and regulatory issue in research management.

# Massachusetts

**Investigator:** Fair Vassoler, Ph.D.  
**Institution:** Tufts University  
Medford, MA  
**Project Title:** Morphine-Induced Changes in Sperm Epigenome  
**Research:** Basic Research  
**Research Area:** Opioid, Transgenerational, Addiction, Epigenetic, Self-Administration  
**Earliest Start Date:** 5/15/2019  
**Housing:** Subsidized

**Student Qualifications:** The student will be required to work with male reproductive tissue including testes, spermatozoa, and seminal fluid. There is also the possibility of working with rats in behavioral studies. This is a great opportunity for individuals interested in pursuing careers in research, human medicine, or veterinary medicine.

**Project Description:** The United States is amid an opioid epidemic. The current population is experiencing wide-spread exposure to opioids. This exposure may have lasting impacts that extend to the next generation. The Vassoler lab examines the impact of adolescent opioid exposure on the susceptibility to substance use disorders in future offspring. The summer project will include examining changes in spermatozoa and testes of adult male rats that were exposed to morphine or saline during adolescence to identify changes that are responsible for transmitting the exposure from sire to offspring. The research project will involve molecular biology including qPCR, immunohistochemistry, and chromatin immunoprecipitation. There is also the potential to be involved in performing rat behavioral studies.



## Massachusetts

**Investigator:** Klaus A. Miczek, Ph.D.  
**Institution:** Tufts University  
Medford, MA  
**Project Title:** Neuropeptides, Social Stress and Drugs of Abuse  
**Research:** Basic Research  
**Research Area:** Neuropeptides, CRF, Ventral Tegmental Area, BNST, Social Stress, Cocaine, In Vivo Microdialysis, Optogenetics, Chemogenetics, Intravenous Self-Administration in Mice and Rats; Neuroanatomical Tract Tracing  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Qualified to work with research animals, enjoy experimental work, statistical summaries, eager to learn

**Project Description:** The summer intern will learn intravenous catheterization in rats and mice, in vivo microdialysis with probes in the BNST, VTA and Accumbens, tract tracing of CRF projections to raphe, amygdala and prefrontal cortex.

# Massachusetts

**Investigator:** Margarita Alegria, Ph.D.  
**Institution:** Massachusetts General Hospital  
Boston, MA  
**Project Title:** The Impact of Medicaid Plans on Access to and Quality of SUD Treatment  
**Research:** Other Research  
**Research Area:** Behavioral Health; Mental Health; Substance Use; Racial/Ethnic Disparities; Evaluation of Systems; Health Plans, New York Medicaid; Health Insurance  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** Excellent organizational, communication and interpersonal skills required. Strong writing and analytical skills are a plus.

**Project Description:** The RA will work on a NIDA-funded study that examines New York Medicaid data to investigate the role of Medicaid privatization on substance use disorder (SUD) treatment, assess differential effects of privatization on access and SUD services, and determine how they might relate to SUD outcomes. The project will look at disparities in the patterns of SUD care by race/ethnicity, gender and rurality; and to generate potential ways to address these issues. As part of qualitative work, we will identify key stakeholders from patients, policy makers, providers, and clinicians who can review our findings, help identify contributors to treatment outcomes, and generate recommendations for improving delivery of SUD treatment services. Research tasks for the summer intern include conducting literature searches and write ups of relevant materials, creating tables and graphs for scholarly papers, entering data, preparing for in-depth interviews, and helping with qualitative data coding. Responsibilities may also include some administrative tasks such as general office and meeting support.

# Massachusetts

**Investigator:** Michael Otto, Ph.D.  
**Institution:** Boston University  
Boston, MA  
**Project Title:** Engaging Working Memory and Distress Tolerance to Aid Smoking Cessation  
**Research:** Clinical Research  
**Research Area:** Clinical Trial, Smoking Cessation, Working Memory, Distress Intolerance, Craving, Interoceptive Exposure, Mindfulness  
**Earliest Start Date:** 5/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Major in psychology with previous lab experience.

**Project Description:** The purpose of this project is to show the relevance of specific vulnerability factors for smoking cessation failure, and to show that modification of these risk factors with intervention results in an improved ability to tolerate periods of nicotine withdrawal/craving without smoking. The vulnerability factors are specifically relevant to low socioeconomic status smokers, and include negative affectivity, low working memory capacity, and low distress tolerance. This research represents a first step toward trying to improve smoking cessation for these individuals by validating new treatment approaches. Summer interns will have the opportunity to learn about and assist with the interventions for this project, and to play a central role in the assessments of smokers trying to resist the temptation to smoke during lab tasks. Experience with this project will inform the intern on characteristics of addiction, their assessment, and the nature of clinical research trials aimed at ameliorating risk factors for quitting. In addition to this primary experience, summer interns will have the ability to devote time to another one of our projects (Nature and Predictors of Impaired Harm Avoidance in Polysubstance Abuse) that is a translational research project that examines the same processes in animals (rats) and humans. Summer interns will have the chance to observe the animal phase of this study as part of learning of the animal to human translational research process.

# Massachusetts

<b>Investigator:</b>	R. Kathryn McHugh, Ph.D.
<b>Institution:</b>	McLean Hospital Belmont, MA
<b>Project Title:</b>	Behavioral Strategies to Reduce Stress Reactivity in Opioid Use Disorder
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Opioid Use Disorder, Stress, Behavioral Therapy, Behavior Change
<b>Earliest Start Date:</b>	5/15/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** This clinical project entails working with human subjects in an acute clinical setting (psychiatric hospital). Preferred qualifications include experience working in some type of helping profession role, preferably in a clinical setting; good organizational and time management skills; and an interest in human subjects' research or clinical practice. Candidates with an interest in careers in medicine, clinical psychology, or other clinical or clinical research area are preferred.

**Project Description:** Stress is an important risk factor for opioid use. The way that people respond to stress (also known as stress reactivity) is a robust predictor of opioid use disorder treatment outcome. Accordingly, there is a clear need to improve treatments to reduce stress reactivity in people with opioid use disorder, with the goal of improving outcomes (e.g., reducing relapse) in this population. The aim of this project is to test behavioral strategies for reducing the impact of stress in people with opioid use disorder. For this study, men and women diagnosed with opioid use disorder will be recruited and will receive training in different strategies for reducing response to stress. We then test whether these strategies help people to experience less craving, negative emotion, and physiological response to stress.

## Massachusetts

**Investigator:** Roland C. Merchant, M.D.  
**Institution:** Brigham and Women's Hospital  
Boston, MA  
**Project Title:** Development and Pilot Testing of a Persuasive Health  
Communication Intervention for Emergency Department  
Patients Who Decline Rapid HIV/HCV Screening  
**Research:** Clinical Research  
**Research Area:** HIV, Hepatitis C, Emergency Medicine, Brief Interventions,  
Screening  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Interns who are willing and excited to learn how to interview patients and administer surveys in a busy emergency medicine setting are invited to become a part of our team. We prefer interns who are bilingual in English and Spanish.

**Program Description:** This project involves assessing the HIV and hepatitis C risk among adult emergency department patients who use drugs. Summer interns will randomly select adult patients at the Brigham and Women's Hospital and Brigham and Women's Faulkner Hospital emergency departments to interview and survey. The intent of the research is to obtain a better understanding of the prevalence of drug use among these patients as well as their risk for an undiagnosed HIV and hepatitis C infection. The results of the project will help inform future interventions to address substance use and HIV and hepatitis C screening among these patients.

# Michigan

**Investigator:** C. Emily Durbin, Ph.D.  
**Institution:** Michigan State University  
East Lansing, MI  
**Project Title:** Neurobehavioral Liabilities for Substance Use Disorders  
**Research:** Behavioral Research  
**Research Area:** Child Temperament, Psychophysiology, Risk Factors,  
Behavioral, Internalizing, Externalizing  
**Earliest Start Date:** 6/5/2019  
**Housing:** Subsidized

**Student Qualifications:** An interest in child development is critical, as well as curiosity, and familiarity with basic databases are important.

**Project Description:** Our project is designed to understand how differences in children's emotional reactivity, responses to rewards, and their brain activity in response to simple computerized tasks are related to their risk for later developing substance use disorders. We use laboratory behavioral measures to evaluate how children respond to different stimuli and challenges to measure their temperament and we measure how their brain responds to making errors and to winning and losing rewards and we assess how these may be part of the family risk for substance use, using previously collected data on their parent(s), who have been assessed for between 5-25 years.

## Michigan

**Investigator:** Shane Perrine, Ph.D.  
**Institution:** Wayne State University School of Medicine  
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:** Drugs of Abuse, Cocaine, Epigenetics, Behavioral  
Neuroscience, Behavior, Neuroimaging, Post-Traumatic  
Stress, PTSD  
**Earliest Start Date:** 5/1/2019  
**Housing:** Campus

**Student Qualifications:** Ideally trainees (1) will be majoring in neuroscience, psychology, biology, or related field, (2) have laboratory research experience outside of the classroom, and (3) be willing to conduct research in animals. However, no prior research experience is required.

**Project Description:** Cocaine addiction devastates the lives of millions of Americans, yet current therapies are poor and development of novel therapeutics is lacking. A translational design that combines state-of-the-art neuroscience techniques with an animal model of cocaine taking and seeking behaviors is being used to study epigenetic mechanisms underlying cocaine addiction. Our studies provide a unique strategy to study the neurobiology that underlies cocaine-motivated behaviors and the knowledge gained will aid in the treatment of this devastating mental health disorder. Other laboratory projects include studies on the effects of traumatic stress exposure (as a model of post-traumatic stress disorder) on drug-taking and related behaviors and reward neurobiology.

# Michigan

**Investigator:** Shelly Flagel, Ph.D.  
**Institution:** University of Michigan  
Ann Arbor, MI  
**Project Title:** Dynamic Control of Cue-Driven Behavior Via the  
Paraventricular Thalamic Nucleus  
**Research:** Basic Research  
**Research Area:** Individual Differences, Reward Learning,  
Neuropsychopharmacology, Animal Models, Addiction  
**Earliest Start Date:** 5/6/2019  
**Housing:** Campus

**Student Qualifications:** Interns are expected to be comfortable working with animals, as the Flagel Lab primarily uses rats. In addition, prior lab experience is preferred as is an interest in pursuing graduate education in Neuroscience or Psychology/Biopsychology.

**Project Description:** How an individual respond to stimuli or cues in the environment associated with reward may be a key determinant of addiction liability. The Flagel Lab uses an animal model that captures individual differences in cue-driven behaviors to study the neural mechanisms that may render an individual susceptible to or resilient from addiction or relapse behavior. Two NIDA-funded projects in the lab are focused on elucidating the neural circuits and neurochemical profiles that characterize addiction-prone and addiction-resilient individuals. By combining sophisticated behavioral analyses with cutting-edge tools to manipulate brain function, the Flagel Lab works to elucidate the neural mechanisms responsible for individual differences in susceptibility to addiction.



# Minnesota

**Investigator:** Sade Spencer, Ph.D.  
**Institution:** University of Minnesota  
Ann Arbor, MI  
**Project Title:** The Role of Dopamine in Modulating Relapse-Induced  
Transient Synaptic Plasticity  
**Research:** Basic Research  
**Research Area:** Addiction, Cocaine, Dopamine, Glutamate, Motivated  
behavior  
**Earliest Start Date:** 5/20/2019  
**Housing:** Campus

**Student Qualifications:** The intern should be comfortable working with rats. The intern should be interested in the neurobiological basis of addiction and other psychiatric disorders. The qualified student will be motivated, attentive, and careful in their work. Ideally this experience will be geared toward students with an interest in pursuing graduate studies in the field of neuroscience.

**Project Description:** Chronic cocaine use is associated with enduring alterations in nucleus accumbens excitatory synapses. In addition to these lasting changes, relapse triggered by drug-associated cues and resulting in eventual drug use stimulates additional rapid changes. It is relatively well understood how chronic cocaine alters glutamate and dopamine neurotransmission in key brain reward areas. What is less clear is how these neurotransmitter dynamics interact on a shorter time scale during relapse to regulate neural plasticity and behavior. The studies in this project are designed to answer that question among others.

## Missouri

**Investigator:** Jose Moron-Concepcion, Ph.D.  
**Institution:** Washington University  
St. Louis, MO  
**Project Title:** Dissecting Circuits Mediating Pain-Induced Alterations in Motivated Behavior  
**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:** 5/31/2019  
**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:** Corey Hopkins, Ph.D.  
**Institution:** University of Nebraska Medical Center  
Omaha, NE  
**Project Title:** Optimization of Mrgx1 Allosteric Agonists as Potential  
Therapies for Chronic Pain  
**Research:** Basic Research  
**Research Area:** Medicinal Chemistry, Drug Discovery  
**Earliest Start Date:** 5/19/2019  
**Housing:** Subsidized

**Student Qualifications:** Preferred: Chemistry or Biochemistry major. The students will NOT work with animals.

**Program Description:** The student will work in the lab with an experienced graduate student or post-doc synthesizing novel compounds to be tested as MrgX1 allosteric agonists for pain therapy.

# Nebraska

**Investigator:** Guoku Hu, Ph.D.  
**Institution:** University of Nebraska Medical Center  
Omaha, NE  
**Project Title:** Intranasal Delivery of Exosomes Loaded with MIRS-223  
AND -124 as a Therapeutic Strategy for Hand in Cocaine  
Users  
**Research:** Basic Research  
**Research Area:** Therapeutic Applications of Extracellular Vesicles (EVs);  
Role of Noncoding RNAs (miRNAs And lncRNAs) in Drug  
Abuse  
**Earliest Start Date:** 5/13/2019  
**Housing:** Subsidized

**Student Qualifications:** The intern should have a basic knowledge of molecular and cell biology, genetics and general human physiology with a career interest in the field of substance abuse. The students will use in vitro cell culture models and ex vivo tissue samples in their study.

**Project Description:** The research conducted in Dr. Hu's laboratory is focused on exploring the effects of noncoding RNAs, including lncRNA and miRNA and their dysregulation associated with drug use, such as morphine and cocaine. He has also carried out extensive work on lncRNA/miRNA studies related to HIV associated CNS disorders using cell culture models and rodent. Furthermore, Dr. Hu is also interested in establishing Extracellular Vesicle (EV)-based methodology of RNA drug delivery for the treatment of CNS complications in HIV infected drug users. His goal is to elucidate the functional aspects of EVs and ncRNAs in drug addiction and HIV infection as well as to identify novel therapeutic strategies that may enhance neuronal function and survival in these disorders.

# Nebraska

**Investigator:** Gurodutt Pendyala, Ph.D.  
**Institution:** University of Nebraska Medical Center  
Omaha, NE  
**Project Title:** Extracellular Vesicles, Meth Relapse and Sex Differences  
**Research:** Basic Research  
**Research Area:** Drug Addiction, Sex Differences, Extracellular Vesicles, Application of Anti-Inflammatory Drugs as Therapeutics to Attenuate Inflammation and Subsequent Drug Seeking Behavior, Synaptic Alterations, Glutamate Biology, Drug Self-Administration  
**Earliest Start Date:** 6/15/2018  
**Housing:** Campus

**Student Qualifications:** My lab has a strong track record in mentoring high school and undergraduate students apart from graduate/post-doctoral/ clinical fellows including exchange students. We welcome any one with a penchant towards neuroscience and interests in the preclinical addiction field (using animal models) at the interface of neurochemistry, neuroplasticity and behavior. Other preferred qualities include strong organizational, communication skills and the ability to work independently and in a group setting.

**Project Description:** My lab is interested in understanding how chronic drug seeking leads to changes at the synapse (key points of communication between neurons and glial cells) which subsequently impact behavior. Another major arm in my lab is understanding the addiction potential of gabapentanoids such as gabapentin as an alternate to opioids. We are probing the addictive potential of gabapentin during and after pregnancy on the overall brain development of the exposed offspring during the course of their development. We are studying changes in the molecular and synaptic correlates in these exposed offspring which may possibly lead to changes in behavior including possibility of predisposing them to addiction and substance abuse disorders. We employ an array of complementing behavioral, molecular, and biochemical coupled to high through "omics" approaches to help understand the molecular underpinnings as a source for developing therapeutic strategies.

## Nebraska

**Investigator:** Minglei Guo, Ph.D.  
**Institution:** Nebraska University Medical Center  
Omaha, NE  
**Project Title:** Mechanisms Underlying Dysregulated Neuroimmune Signaling and Neuronal Dysfunction in HIV (+) Individuals with Cart and Cocaine  
**Research:** Basic Research  
**Research Area:** Drug Abuse, Cocaine, Antiretroviral, HIV, Neuroinflammation  
**Earliest Start Date:** 6/17/2019  
**Housing:** Subsidized

**Student Qualifications:** The intern should have major on biology/neuroscience/chemistry with strong interests on the basic medical research. For this project, the intern will learn cell culture and perform experiments including qRT-PCR & WBs. The intern will not do any animal experiments neither on human samples.

**Project Description:** Previous findings have demonstrated that cocaine has the ability to activate microglia in vitro & in vivo and autophagy dysregulation underlies this phenomenon. Whether lysosome defection underlies cocaine mediated autophagy dysregulation and microglial activation has never been explored. To bridge this gap, in this project, we will investigate the effects of cocaine on lysosomal function in vitro & in vivo. BV2 mouse microglia cells and primary microglia will be cultured and exposed to cocaine followed with the detection on the levels of lysosome markers. Meanwhile, cathepsin D activity and lysosome membrane permeability (LMP) will be assayed in microglia with/without cocaine exposure. In addition, microglial cells will be pre-exposed to lysosomal protector N-acetylcysteine (NAC) followed with cocaine exposure for another 24 hours. The levels of various pro-inflammatory mediators including IL6, IL1 $\beta$ , & TNF $\alpha$  will be assayed by quantitative (q) RT-PCR or ELISA approach. The findings obtained from in vitro studies will be further confirmed by in vivo experiments. Mice with cocaine administration (20 mg/kg, 7 days, I.P.) with/without NAC pre-injection will be sacrificed and the striatal homogenates will be prepared for the detection on lysosome markers as well as cathepsin D activity and LMP. The levels of various pro-inflammatory mediators including IL6, IL1 $\beta$ , & TNF $\alpha$  will be assayed by qRT-PCR or ELISA approach.

# Nebraska

**Investigator:** Sowmya Yelamanchili, Ph.D.  
**Institution:** University of Nebraska Medical Center  
Omaha, NE  
**Project Title:** Role of Extracellular Vesicles in Methamphetamine Mediated Neurotoxicity  
**Research:** Basic Research  
**Research Area:** Methamphetamine Addiction, Opioid Addiction, Extracellular Vesicles, microRNAs  
**Earliest Start Date:** 6/4/2019  
**Housing:** Campus

**Student Qualifications:** Interest in addiction biology is preferred but not necessary. Our laboratory has diverse set of expertise ranging from rat behavior to molecular biology techniques. Most of the studies in the laboratory is focused on rat models of addiction and therefore the intern will be working with postmortem rat tissues. Some of post-validations will be conducted on plasma and serum clinical samples from humans and therefore we expect some work to be performed on human samples.

**Project Description:** Oxycodone (oxy), is a semi-synthetic opioid commonly used as a pain medication which also is a widely abused prescription drug. While very limited studies have examined the effect of in utero oxy (IUO) exposure on neurodevelopment, a significant gap in knowledge is the effect of IUO compared with postnatal oxy (PNO) exposure on synaptogenesis – a key process in the formation of synapses during brain development in the exposed offspring. One relatively unexplored form of cell–cell communication associated with brain development in response to pre- and postnatal oxy exposure are extracellular vesicles (EVs). The study would evaluate the role of brain derived EVs and their microRNA cargo signatures in the IUO and PNO exposed groups. The focus will be on assessing the EV-miRNA cargo on neuronal function and stability. Further, these EV-miRNA signatures and associated key gene targets will be validated to regulate synaptic function and subsequent neurodevelopment.

## Nebraska

**Investigator:** Tony W. Wilson, Ph.D.  
**Institution:** University of Nebraska Medical Center  
Omaha, NE  
**Project Title:** Signatures of Cannabis Abuse in NeuroHIV (SCAN):  
An Integrated Molecular and Imaging Approach  
**Research:** Clinical Research  
**Research Area:** Human Neuroimaging, Cannabis, neuroHIV, HIV,  
AIDS, MEG, fMRI, MRI, Neurophysiology, Biomarker,  
Brain  
**Earliest Start Date:** 6/4/2019  
**Housing:** Campus

**Student Qualifications:** All interns will work with human subjects. Undergraduates majoring in neuroscience, psychology, engineering, biology, and computer science are preferred. Excellent computer skills are a must, as all neuroimaging data collection and processing is computer based. Prior experience in human subjects' research, cognitive psychology, biological psychology, and related disciplines will be helpful.

**Project Description:** Interns will be participating in collecting and analyzing multiple types of human data from an ongoing study. This will include the use of advanced brain imaging technologies such as magnetoencephalography (MEG), functional MRI, and structural MRI, as well as neuropsychological and cognitive-emotional assessments. Participants in this study include persons living with HIV infection who either regularly use cannabis (marijuana) or have never used cannabis, as well as uninfected demographically-matched control groups who do and not regularly use cannabis. Interns will be trained in instrument safety as well as advanced signal processing methods often applied to neuroimaging data.



# New Hampshire

**Investigator:** Alireza Soltani, Ph.D.  
**Institution:** Dartmouth College  
Hanover, NY  
**Project Title:** CRCNS Research Proposal: Cortico-Amygdalar Substrates of Adaptive Learning  
**Research:** Basic Research  
**Research Area:** Learning, Decision Making, Neural Circuit, Reward  
**Earliest Start Date:** 6/15/2019  
**Housing:** Campus

**Student Qualifications:** Training to work with human subjects, some programming skills in Matlab or similar languages

**Project Description:** The real world is uncertain and constantly changing. As a result, human and other animals have evolved to adjust to the environment constantly. Specifically, certain characteristics of the real world require that learning and decision-making processes be adjusted constantly. For example, in nature and in ecologically valid settings that approximate the real world, learning from reward feedback is challenging because choices have many features (e.g. color, shape, texture), each of which can take on different values, resulting in a large number of options whose reward values have to be learned. Learning becomes even more challenging when reward information change over time. The adjustments in behavior could be about what should be learned, how much should be learned, and what information should be used for making decisions.

# New Hampshire

**Investigator:** Godfrey Pearlson, M.D.  
**Institution:** Yale University School of Medicine  
Hartford, CT  
**Project Title:** Neuroscience of Marijuana Impaired Driving  
**Research:** Clinical Research  
**Research Area:** Acute Dose Study; Marijuana Research; Functional MRI  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Research requires student to work with human subjects & bio samples. Student would have to be comfortable with individuals exhibiting altered behavior, & comfortable with administration of controlled substances in a laboratory environment. Position requires math competence and Excel experience

**Project Description:** Recreational marijuana users are recruited for three separate study days where they are given different doses of cannabis or placebo, drive a vehicle and virtual-reality inside of an MRI scanner to look at brain patterns, and complete various computerized cognitive tests including simulated driving. Blood and saliva samples are collected over several hours.

## New York

<b>Investigator:</b>	Christina Hoven, Dr. Ph, M.P.H.
<b>Institution:</b>	New York State Psychiatric Institute/Columbia University New York, NY
<b>Project Title:</b>	Cognitive Control in Children of SUD Parents: A Longitudinal Multimodal MRI Study
<b>Research:</b>	Epidemiology Research
<b>Research Area:</b>	Brain Imaging (MRI), Neuroscience of Decision Making, Epidemiology.
<b>Earliest Start Date:</b>	5/20/2019
<b>Housing:</b>	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:** Eric J. Nestler, M.D.  
**Institution:** Icahn School of Medicine at Mount Sinai  
New York, NY  
**Project Title:** Role of Neurotrophic Factors in the Actions of Drugs of Abuse  
**Research:** Basic Research  
**Research Area:** The major goals of this project are to study the modulation of the biochemical and behavioral actions of drugs of abuse in the mesolimbic dopamine system by neurotrophic factors.  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Undergraduate college knowledge of biology and neuroscience and willingness to do research with laboratory mice and rats.

**Program Description:** Participate in basic biochemistry and molecular biology research involving use of laboratory animals.

## New York

**Investigator:** Ganjam Kalpana, 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:** Molecular Biology, HIV-1 Replication, HIV-1 Latency,  
Single Cell Single Molecule Imaging, Methods to  
Quantitate Latent Reservoirs, Characterizing Latency in  
CNS Reservoirs, Effect of Illicit Drugs on Reactivation and  
Establishment of CNS Latent Reservoirs, HIV-1 Latency In  
Microglia and Astrocytes  
**Earliest Start Date:** 7/1/2019  
**Housing:** Subsidized

**Student Qualifications:** First requirement is that the student is highly motivated, is interested in learning and is interested in doing biological research. Some level of basic tissue culture and microscopy experience will be preferable. We will not be doing animal or human research.

**Project Description:** The Kalpana laboratory has developed a novel single-cell based, ultra-sensitive assay that provides in-depth view of the HIV-1 reactivation kinetics in latent reservoirs. This provides a unique opportunity to study CNS reservoirs and the effect of illicit drugs on these reservoirs. In collaboration with Manhattan Brain Bank, we will develop an understanding of how brain HIV reservoirs are affected by drug abuse. Our studies are likely to help develop strategies to eradicate HIV reservoirs in the brain.

## New York

<b>Investigator:</b>	Honorio Guarino, Ph.D.
<b>Institution:</b>	National Development and Research Institutes, Inc. New York, NY
<b>Project Title:</b>	Preventing Injection: An mHealth Intervention that Leverages Social Networks to Prevent Progression to Injection among Young Opioid Users
<b>Research:</b>	Preventive Research
<b>Research Area:</b>	Young Adults; Opioid Misuse; mHealth; Injection Drug Use; Cognitive Behavioral Therapy; Behavioral Intervention
<b>Earliest Start Date:</b>	6/3/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** The intern should be a student in a behavioral, social science or public health-related field with an interest in learning about and working with young drug users. The student should be comfortable working with people who use drugs, as the internship will require the student to interact with young adults (18-29 years of age) who use heroin and/or other opioids. The student should also have excellent attention to detail and strong written and oral communication skills.

**Project Description:** The intern will learn about and participate in the daily operations of a clinical trial to evaluate a novel mobile phone-based intervention designed to prevent progression to regular injection drug use, overdose and other harms among young adults in New York City who use heroin and/or other opioids. During a brief, initial period, the intern will become familiar with the study protocol and complete the required online training for working with human research subjects. Subsequently, the intern will be based primarily at the study's storefront field site, working closely with research staff to learn about and assist with a broad range of research activities associated with the implementation of a randomized controlled trial to evaluate a technology-based behavioral intervention. These research activities may include: greeting and interacting with study participants and prospective participants at the field site; helping to schedule appointments with participants and contacting participants to remind them of scheduled appointments; observing eligibility screenings, informed consent sessions and structured interviews with participants; recording the results of point-of-care urine drug tests; and assisting with maintenance of study databases, files and other documentation. If desired, the PIs may also work with the intern on a small project aligned with the student's specific interests - e.g., literature review; small analysis of preliminary data (quantitative or qualitative).

## New York

<b>Investigator:</b>	Joseph Palamar, Ph.D.
<b>Institution:</b>	New York University Langone Medical Center New York, NY
<b>Project Title:</b>	Drug Use Among Nightclub and Dance Festival Attendees in New York City
<b>Research:</b>	Epidemiology Research
<b>Research Area:</b>	Club Drugs; Nightclubs; Electronic Dance Music; Dance Festivals; Ecstasy; Molly; New Psychoactive Substances; Bath Salts; Survey; Epidemiology; Hair Testing; Adulterants; Ketamine; Cocaine; Methamphetamine
<b>Earliest Start Date:</b>	5/3/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** Ideal candidates will be enrolled in an undergraduate program focusing on public health, psychology, sociology, nursing, or another health- or social science-related discipline. Excellent English and oral communication skills are necessary, and socially-outgoing individuals are preferred as interns must be comfortable approaching passersby on the street. Familiarity with the EDM scene is preferred, and must be willing to work late night hours. No prior research experience necessary.

**Program Description:** This study focuses on drug use among adults in the electronic dance music (EDM) party scene in New York City (NYC). We collect data on self-reported drug use and we also collect hair samples from participants to determine whether they have unknowingly been exposed to novel drugs such as “bath salts” which are commonly present in ecstasy/Molly. The intern with help research assistants survey individuals about to enter nightclubs and dance festivals, typically late at night (from about 11pm to about 1:30am). The majority of randomly selected parties are in Brooklyn and Manhattan. Interns will help research assistants track the number of individuals entering each randomly-selected party and approach individuals about to enter parties to determine eligibility and interest in participation. They will also assist research assistants administer the survey on electronic tablets, assist in the collection and tracking of hair samples, and help track recruitment and participant payments. The intern will also attend short periodic team meetings to discuss progress. Emphasis is placed on safety and the interns will always work with a group of research assistants.

## New York

**Investigator:** Panayotis Thanos, Ph.D.  
**Institution:** University at Buffalo  
Buffalo, NY  
**Project Title:** Fatty Acid Binding Protein - Mediated Control of  
Endocannabinoid Signaling and Drug Addiction  
**Research:** Basic Research  
**Research Area:** Endocannabinoids, Cocaine Abuse, Behavioral  
Neuropharmacology, Neuroimaging  
**Earliest Start Date:** 6/3/2019  
**Housing:** Campus

**Student Qualifications:** Qualifications preferred include: Previous lab experience handling animal or human tissue samples, previous coursework in biological psychology, neurobiology or related field, and experience working in a laboratory, following instructions, record keeping and responsible team work.

**Project Description:** The summer research intern will assist in this project in a variety of ways. These include but not listed to getting training in and performing numerous behavior neuropharmacology methods associated with cocaine and drug addiction. In addition, the intern will be trained in conducting basic science research, data assessment, written and oral presentation and be part of a large interdisciplinary research team in the laboratory of Dr. Thanos. Interns will gain strong research skills and experience essential for a research career.



## New York

**Investigator:** Pedro Mateu-Gelabert, Ph.D.  
**Institution:** National Development & Research Institutes  
New York, NY  
**Project Title:** Staying Safe Intervention: Preventing HCV Among Youth  
Opioid Injectors  
**Research:** Preventative Research  
**Research Area:** Hepatitis C Prevention, Epidemiology of Drug Use, Young  
Opioid Users, Opioid Epidemic  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Interest in the epidemiology of drug use. Previous qualitative or quantitative research experience. The internship will require interaction with human subjects. Please note there is no on-campus housing availability.

**Program Description:** Young people who inject drugs are at extremely high risk for HCV infection using contaminated injection equipment. To date, no behavioral intervention has been sufficiently potent to produce significant reductions in HCV incidence among PWID. To address this need, the project is developing Staying Safe (Ssafe), an innovative, strengths-based, socio-behavioral HCV prevention intervention. This study will assess the effectiveness of the Ssafe intervention in reducing both injection-related HCV and HIV risk behavior and HCV incidence among young adults (ages 18-29) who inject opioids (heroin and/or prescription opioids).

## New York

**Investigator:** Xiaosi Gu, Ph.D.  
**Institution:** Icahn School of Medicine at Mount Sinai  
New York, NY  
**Project Title:** Computational and Neural Modeling of Cue Reactivity in  
Addiction  
**Research:** Basic Research  
**Research Area:** Computational Psychiatry; Addiction; Brain Imaging;  
Computational Modeling; Machine learning  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Prior training or coursework in one of two of the following areas is required: math's, physics, computer science, psychology, neuroscience, or biomedical sciences. Prior experience in programming is preferred (e.g. MATLAB, R, python, C++). This project will only involve computer-based analysis of existing data, and will NOT involve contact with animals, humans, or biological samples.

**Project Description:** Substance use disorders (SUD) and obesity are both major public health concerns in the United States, with an estimated 20.8 million Americans struggling with at least one SUD in 2015 and 78.6 million adults and 12.7 million children who are obese. Cue-elicited craving is a central symptom of both drug addiction and binge eating and a strong predictor of relapse. In this project, we will investigate the brain basis of cue-induced craving across multiple SUD groups (tobacco, cannabis, alcohol) and binge eaters, using state-of-the-art computational modeling and machine learning methods.

## North Carolina

**Investigator:** Brian F. Thomas, Ph.D.  
**Institution:** RTI International  
Research Triangle Park, NC  
**Project Title:** Investigation of Synthetic Cannabinoid Exposures and Pharmacological Consequences  
**Research:** Basic Research  
**Research Area:** Pharmacology, Molecular, Receptor Signaling, In Vitro, G Protein, G Protein Coupled Receptor, Cannabinoids, Cannabis, Synthetic Cannabinoids  
**Earliest Start Date:** 5/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Preferred candidates will have previous laboratory experience (e.g. pipetting, familiarity with molarity/dilutions) majoring in a science (e.g. biology, chemistry) planning a career in science (e.g. pharmacology, biology). Research requires working with animal brain tissue (but not live animals or collection of the tissue) and radiochemicals (tritium and sulfur-35). Interns will be required to take a training course in radiation safety (offered by RTI) prior to working with radiochemicals.

**Program Description:** Cannabis is the most widely abused substance in the world and its psychoactive effects are primarily due the drug delta-9-tetrahydrocannabinol acting at the cannabinoid type-1 (CB1) receptor. In recent years, clandestine chemists have been synthesizing research chemicals that also bind and activate the CB1 receptor (synthetic cannabinoids) which are then sold online and in head shops to individuals seeking a replacement for cannabis or who want to experience effects. However, these compounds have a propensity to produce untoward effects and have led to hospitalizations and been attributed to numerous deaths. Questions remain regarding the mechanism(s) through which these effects occur and whether they are due to the parent compound and/or their thermolytic and metabolic products.

This project will involve molecular pharmacological characterization of abused synthetic cannabinoids and their degradants in assays of receptor binding and signaling. Interns will learn basics in the principles of pharmacology and techniques in molecular pharmacology to conduct receptor radiochemical binding and signaling studies utilizing both membrane based and cell based assays. Techniques that will be learned include basic laboratory skills, cell culture, protein quantification, radioligand binding, safe handling of radiochemicals, scintillation spectrophotometry, and data analysis using Graphpad Prism.

## North Carolina

**Investigator:** Dana Hancock, Ph.D.  
**Institution:** RTI International  
Research Triangle Park, NC  
**Project Title:** Integrating Epigenomics in Human Brain and Genomics of Nicotine Dependence  
**Research:** Basic Research  
**Research Area:** Genome-Wide Association Studies; Genetics; Epigenetics; Gene Regulation; Brain; Epidemiology; Gene-Environment Interaction; Addiction; Nicotine; Opioids; HIV; Lung Function  
**Earliest Start Date:** 5/27/2019  
**Housing:** Subsidized

**Student Qualifications:** A basic biological background and/or quantitative and analytic skills are preferred. The research involves all existing human data, with no new human participant contact.

**Project Description:** The goal of our overarching project is to discover biologically important genetic variants underlying risk for nicotine dependence. To achieve this goal, we are studying gene regulation differences in postmortem human brain of smokers vs. nonsmokers, mapping DNA variants underlying these differences, and conducting association testing of the DNA variants with nicotine dependence in a genome-wide analysis of 58,000 smokers. Results of this study may identify important biological pathways for nicotine dependence and smoking cessation and ultimately reduce the burden of smoking-related health outcomes.

## North Carolina

<b>Investigator:</b>	Eva Telzer, Ph.D.
<b>Institution:</b>	University of North Carolina Chapel Hill Chapel Hill, NC
<b>Project Title:</b>	Incorporating the Social Context into Neurocognitive Models of Adolescent Risk Taking
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Adolescence; Adolescent Brain Development; Behavior; Brain Imaging; Developmental Psychology; Drug Use; Family; Peers; fMRI; Neuroscience; Parenting; Puberty; Social Behavior; Risk Taking; Teens
<b>Earliest Start Date:</b>	5/20/2019
<b>Housing:</b>	Campus

**Student Qualifications:** This position is ideal for students interested in pursuing a PhD in psychology, neuroscience, or related field, as well as individuals looking to work on cutting edge research with diverse populations. We are looking for meticulous, energetic individuals with excellent organizational and interpersonal skills. Flexible and independent thinking are required. The applicant should have an interest working with people of all ages and backgrounds, and must be available to work evenings and weekends.

**Project Description:** The Developmental Social Neuroscience (DSN) lab's Project NeuroTeen is a longitudinal study examining the important role of peers and parents on neurobiological development and drug use during adolescence. With funding from an R01 grant from the National Institutes of Health, the DSN lab follows 150 middle school students across 3 years investigating how the brain changes during this important developmental phase. Diverse methodological tools are used, including hair sampling to obtain cortisol, a stress hormone, fMRI to capture neural activation during reward processing and decision-making, and questionnaires to assess adolescent risk-taking and drug use. By studying changes in brain development, the DSN lab seeks to broaden the field's understanding of the biological experiences and social contexts that help teens thrive.

## 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:** 6/3/2019  
**Housing:** Campus

**Student Qualifications:** Our laboratory conducts basic research using animal models in the areas of neurobiology, behavior and genetics. A 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.

## North Carolina

**Investigator:** Rong Chen, Ph.D.  
**Institution:** Wake Forest School of Medicine  
Winston Salem, NC  
**Project Title:** RGS2 Regulation of D2 receptor signaling  
**Research:** Basic Research  
**Research Area:** To Study the Molecular Mechanisms of Drugs of Abuse  
(Cocaine & Alcohol)  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** Motivated to learn

**Project Description:** We have identified that a protein called RGS2 is regulated by exposure to drugs of abuse. We will use genetic tools to overexpress or knock down RGS2 proteins in the brain and investigate whether alterations in RGS2 protein and activity levels will influence drug-seeking and taking behavior in rodent models of drug self-administration.

## North Carolina

<b>Investigator:</b>	Stacey Daughters, Ph.D.
<b>Institution:</b>	University of North Carolina Chapel Hill Chapel Hill, NC
<b>Project Title:</b>	Technology Enhanced Behavioral Activation Treatment for Substance Use
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Substance Use; Substance Use Disorder; Alcohol Use Disorder; Clinical Treatment; Clinical Psychology; Behavioral; Activation Therapy; Neuroscience
<b>Earliest Start Date:</b>	5/20/2019
<b>Housing:</b>	Campus

**Student Qualifications:** An ideal candidate will have the following qualifications:

1. Experience in a research setting with a clinical population.
  2. Educational background in one or more of the following fields, psychology, neuroscience, biology, public health, or a similar field.
  3. Career interests in psychology, neuroscience, public health, medicine, or a similar field.
- This position will require working with a diverse population of treatment seeking substance users throughout the triangle area.

**Project Description:** The Biobehavioral Research on Addiction and Emotion (BRANE) lab within the Department of Psychology and Neuroscience at the University of North Carolina, Chapel Hill focuses on examining the mechanisms underlying substance use disorders and translating this knowledge into the development and testing of interventions. We conduct both experimental and treatment outcome research integrating behavioral, biological and neural assessment methodology. The NIDA intern will primarily contribute to ongoing studies in the lab.



## Ohio

**Investigator:** Alan Levine, Ph.D.  
**Institution:** Case Western Reserve University  
Cleveland, OH  
**Project Title:** Identification of Immune Protective Pathways Dysregulated by Opioid Use in HIV Infection, Using a Systems Biology-Based Approach, Toward the Goal of Pharmacological Restoration of Immune Function  
**Research:** Basic Research  
**Research Area:** Intestinal permeability; Opioids; HIV; Mucosal immunology; Epithelium  
**Earliest Start Date:** 5/27/2019  
**Housing:** Campus

**Student Qualifications:** Senior in high school through UG education, with a keen interest in scientific research as a career goal. Interns will work with human tissue and cells.

**Project Description:** Opioid misuse is a crisis that not only includes addiction but also enhanced disease progression for an HIV infected person. We propose that opioids do so because they directly alter host immune defense, the intestinal barrier, and the microbiome. Summer interns will be paired with either graduate students or postdoctoral fellows to dissect the mechanisms and signal transduction pathways initiated by opioids in human T lymphocytes and intestinal epithelial cells.

# Ohio

**Investigator:** Frank Scott Hall, Ph.D.  
**Institution:** University of Toledo  
Toledo, OH  
**Project Title:** High Throughput Approaches to Determining the Lethality of Synthetic Psychoactive Cathinone's Using Danio Rerio Larvae  
**Research:** Basic Research  
**Research Area:** Drug Abuse, Synthetic Cathinone's, Bath Salts, Lethality, Toxicity, Overdose, Zebrafish  
**Earliest Start Date:** 5/13/2019  
**Housing:** Campus

**Student Qualifications:** The intern should have a background in neuroscience, pharmacology, or a related discipline. General familiarity with basic laboratory techniques is necessary, but all specific scientific techniques will be learned during the internship. Work will be conducted with zebrafish larvae and tissue.

**Project Description:** In recent years, drugs of the cathinone class (synthetic cathinone's; beta-keto amphetamines; commonly called "bath salts") have increased greatly in usage among illicit users. This increased prevalence has been associated with increased adverse events, including overdose and death, according to clinical reports. However, these reports suffer from several shortcomings, often including a failure to confirm the specific drugs used, and most overdose patients have often taken many drugs. This makes it difficult to determine whether particular cathinone's actually have increased toxic and lethal effects compared to other amphetamine drugs such as methamphetamine and methylenedioxymethamphetamine. Controlled studies in animal models are needed to address this question, as well as to identify the mechanisms underlying cathinone-induced toxic and lethal effects. To address this problem, this grant examines the lethality and toxicity of a series of synthetic cathinone's using a high-throughput assay in zebrafish larvae. This assay will allow the determination of the structure-activity relationships for the lethal and toxic effects of this class of drugs.

## Oregon

<b>Investigator:</b>	Emily Tanner-Smith, Ph.D.
<b>Institution:</b>	University of Oregon Eugene, OR
<b>Project Title:</b>	Brief Substance Use Interventions in General Healthcare Settings: Understanding Variability in Effects
<b>Research:</b>	Preventative Research
<b>Research Area:</b>	Systematic Review; Meta-Analysis; Individual Participant Data Meta-Analysis; Brief Alcohol Intervention; Brief Substance Abuse Intervention; Primary Care; Exploratory Data Analysis; Statistical Modeling
<b>Earliest Start Date:</b>	6/17/2019
<b>Housing:</b>	Campus

**Student Qualifications:** Preferred qualifications: Coursework or experience in statistics; basic knowledge of experimental research design; attention to written detail; excellent reading comprehension in English.

Relevant education/majors: Psychology, Social Work, Sociology, or other related social/behavioral sciences

Relevant career interests: Program evaluation, research, statistics, substance use prevention

This research does not involve contact with human patients, animals, or tissue samples.

**Project Description:** Excessive alcohol consumption and drug use are important public health priorities. Brief interventions (BIs) aimed at reducing drug and alcohol use are one potentially cost-effective way to intervene with substance users in general healthcare settings. Understanding when and for whom BIs are most effective has important public health implications for reducing the consequences associated with problematic levels of drug and alcohol use. The proposed research project, conducting a systematic review and meta-analysis of the BI literature, will generate useful information for both researchers and practitioners by providing a more comprehensive understanding of the types of patients, intervention components, and contexts in which BIs may be maximally effective in reducing drug and alcohol use. The summer research intern will join a team of dedicated researchers and participate in an ongoing systematic review of brief intervention (BI) literature. This will involve acquiring knowledge and familiarity of the BI field in order to participate in detailed reading of study reports and the extraction of data related to methodology, quality, outcomes, and effect sizes. Furthermore, the intern will learn how to manage large amounts of study data, perform exploratory analyses, and design and apply statistical models.

# 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

# Pennsylvania

**Investigator:** Bradley Taylor, Ph.D.  
**Institution:** University of Pittsburgh  
Pittsburgh, PA  
**Project Title:** Long-Term Activation of Spinal Opioid Analgesia After Inflammation  
**Research:** Basic Research  
**Research Area:** Chronic Pain; Opioid Dependence; Neuropharmacology  
In Vivo Optogenetics And Calcium Imaging  
**Earliest Start Date:** 5/1/2019  
**Housing:** Campus

**Student Qualifications:** This research will require the student to study behavior in mice, including channelrhodopsin transgenic mice for optogenetics experiments. The ideal candidate major in neuroscience, psychology, bioengineering, or related field, with an eye towards PhD or MD/PhD training leading to a job in a Tier 1 academic institution or pharmaceutical company. Some research experience is preferred but applicants with strong biological laboratory coursework or other notable strengths will be considered.

**Project Description:** The journal SCIENCE (Corder and Taylor and et al, 2013) and elsewhere describe that tissue or nerve injury triggers constitutive activity (activity in the absence of neurotransmitter binding) at mu and kappa opioid receptors and cannabinoid receptors. This can last over one year in the mouse or rat, and has been demonstrated in humans as well. This mechanism allows the body to keep chronic pain in remission despite lasting sensitization of somatosensory pathways. Remarkably, the body can become "dependent" on long-lasting activity of opioid receptor, such that a drug receptor antagonist can produce behaviors reminiscent of opiate drug withdrawal. This project will evaluate the brain regions responsible for this "endogenous opioid withdrawal"

# Pennsylvania

**Investigator:** Mathieu Wimmer, Ph.D.  
**Institution:** Temple University  
Philadelphia, PA  
**Project Title:** Unraveling Epigenetic Mechanisms of Opioid Addiction  
Susceptibility Using Multigenerational Animal Models  
**Research:** Basic Research  
**Research Area:** Epigenetics, Addiction, Multi-Generational, Opioid, Self-  
Administration  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** The intern should be willing to work with animals and interested in learning molecular biology techniques. A strong biology background is recommended but not necessary. This research requires working with animals and tissue samples.

**Project Description:** My lab is interested in the impact of drug exposure in fathers (sires) on addiction-like behavior in the next generation. We use the drug self-administration model in rats to study addiction-like behaviors in the offspring of morphine-taking sires. The goal of our research is to 1) identify epigenetic mechanisms in the germline responsible for the transmission of drug exposure to the next generation and 2) define changes to the epigenetic landscape in the brain of offspring produced by drug-treated sires. The ultimate objective of my research program is to delineate mechanisms predictive of addiction vulnerability using multi-generational models of drug exposure.

# Pennsylvania

**Investigator:** Ping Wang, Ph.D.  
**Institution:** University of Pennsylvania  
Philadelphia, PA  
**Project Title:** Development of a Point-of-Care Volumetric Bar-Chart Chip  
for Drug Quantitation  
**Research:** Clinical Research  
**Research Area:** Drugs of Abuse, Therapeutic Drug, Diagnostics Assay  
Development, Point-Of-Care Diagnostics, Drug  
Quantification  
**Earliest Start Date:** 7/1/2019  
**Housing:** Subsidized

**Student Qualifications:** The preferred intern would have passion for diagnostic and analytical science and good communication skills in both writing and speaking. Some prior background in chemistry or engineering research would be a plus. The research group may interact with patients or use patient blood and urine specimens for research, but the intern is not required to do so.

**Project Description:** The summer intern will work with the PI and other research group members to develop novel diagnostic assays and devices to rapidly and objectively assess the absence/presence of various drugs of abuse or therapeutic drugs in patient specimens (venous blood, fingerstick blood, urine etc.). There will be opportunities to work across disciplines with collaborators with medicine or engineering background and expertise.

# Pennsylvania

**Investigator:** Rodrigo Espana, Ph.D.  
**Institution:** Drexel University  
Philadelphia, PA  
**Project Title:** Hypocretin/Orexin Regulation of Dopamine Signaling and Cocaine Reinforcement  
**Research:** Basic Research  
**Research Area:** Fast Scan Cyclic Voltammetry, Neurochemistry, Sleep, EEG/EMG, Addiction, Dopamine, Relapse, Abstinence  
**Earliest Start Date:** 6/22/2019  
**Housing:** Campus

**Student Qualifications:** This research project involves rat handling, animal surgery and brain sample processing. The ability and willingness to work with rats.

**Project Description:** Sleep disruptions are commonly observed during recovery from chronic cocaine use and are believed to promote cocaine craving and relapse. Thus, one potential strategy for treating cocaine addiction is to manipulate sleep. We will employ a rat model of cocaine self-administration combined with sleep and dopamine signaling recordings to assess whether correcting sleep disruptions can be employed to reduce cocaine craving. Rats will be exposed to cocaine self-administration and sleep disruptions and cocaine craving will be monitored. We will test whether restoration of sleep architecture attenuates cocaine craving and whether these effects involve alterations in dopamine signaling. This project is likely to have sustained and significant impact on the drug abuse field because it will provide novel information on whether sleep therapies can serve as a transitionally-relevant approach for treating cocaine dependence.



# Pennsylvania

<b>Investigator:</b>	Servio H. Ramirez, Ph.D.
<b>Institution:</b>	The Lewis Katz School of Medicine at Temple University Philadelphia, PA
<b>Project Title:</b>	Brain Endothelial EVS Role in the Neuropathology of Drugs of Abuse and HIV
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Neuroinflammation; Blood-Brain Barrier; Microfluidics; Extracellular vesicle biology; Drugs of abuse; Neuroimmunology; Brain imaging
<b>Earliest Start Date:</b>	6/3/2019
<b>Housing:</b>	Campus

**Student Qualifications:** The student should be enrolled in an undergraduate major related to the life sciences (Biology, Biochemistry, Neuroscience, Microbiology etc) or Biomedical Engineering related fields. Ability to interact with a diverse group of students, faculty, and staff. Highly motivated individual capable of working independently or as part of a team. Willing to work with animals if necessary.

**Project Description:** Cerebrovascular injury, particularly Blood-Brain Barrier (BBB) disruption is an established hallmark consequence of neuroinflammation. Formed by brain endothelial cells, the role of the BBB in the CNS is to protect and maintain the microenvironment necessary for neuronal function. The BBB is a conceptual term that describes multiple aspects of this barrier property. For instance, the BBB is thought of as a barrier to: blood solutes (the physical barrier), xenobiotics (transport barrier), toxins, (metabolic barrier) and neuroinvasion (immunological barrier). Methamphetamine, cocaine and other drugs of abuse can induce neuroinflammation that alters the BBB. In this project the student will explore all aspects of the BBB, using a state of the art microfluidic chip model of the neurovascular unit (Andrews A et. al., J Cereb Blood Flow Metab. 2018 May;38(5):888-903). This study will be the first to provide a head to head comparisons between various drugs of abuse and their impact on BBB dynamics. The opportunity to submit this work for publication (at the completion of the internship) is very high. -To learn more about our laboratory, please visit [www.RamirezNeuroLab.com](http://www.RamirezNeuroLab.com)

# Pennsylvania

**Investigator:** Wenzhe Ho, M.D., M.P.H.  
**Institution:** Temple University  
 Philadelphia, PA  
**Project Title:** Role of miRNA in Methamphetamine/HIV-Mediated  
 Immune Activation  
**Research:** Other Research  
**Research Area:** Host Cell Innate Immunity, HIV and HCV, Opioids,  
 Methamphetamine, Antiviral Natural Products  
**Earliest Start Date:** 6/3/2019  
**Housing:** Campus

**Student Qualifications:** Prefer students with the biology major or related 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 the ability to organize/present data. Students also have excellent communication skill and can read and write in English.

**Project Description:** Chronic immune activation is a major factor in HIV disease progression. Bacterial products of microbial translocation from the gut are likely to be a cause of systemic immune activation in chronic HIV infection. However, the mechanism(s) responsible for chronic immune activation remains to be determined. Given that drugs of abuse contribute greatly to HIV infection, it is crucial to study whether the use of methamphetamine (METH), one of the most commonly abused drugs among HIV-infected individuals, is associated with HIV infection-related systemic inflammation and chronic immune activation. The summer research project proposed three specific aims to address the hypothesis that METH use results in inflammation and immune activation through the induction of the inflammatory and neurotoxic miRNAs. Aim 1: To study whether monocytes and T lymphocytes from METH users express higher levels of the inflammatory/neurotoxic miRNAs than those from non-METH users; Aim 2: To investigate whether METH has the synergetic effect with the microbial products on enhancing HIV infection of macrophages; Aim 3: To examine the effects of METH and/or HIV on the expression of inflammatory and neurotoxic miRNAs in the cells from CNS (neuronal cells, astrocytes, BMVEC).

# 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:** 6/3/2019  
**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:** Christopher W. Cowan, Ph.D.  
**Institution:** Medical University of South Carolina  
Charleston, SC  
**Project Title:** Role and Regulation of Class IIa HDACs in Cocaine Addiction  
**Research:** Basic Research  
**Research Area:** Cocaine, Cocaine Reward, Gene Regulation, Epigenetics,  
Cocaine Self-Administration, Protein Biochemistry  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** The student intern does not require prior research experience, but the project plan will likely be adjusted based on prior experience level. However, the student intern will be asked to work with rodents and rodent tissues samples. An ideal candidate might also have some prior coursework in biology, psychology, biochemistry and some basic lab course experience.

**Project Description:** The lab studies how drugs of abuse, like cocaine, alter the function of the brain as it relates to future drug craving and drug seeking. The intern project would likely involve assisting with rodent behavioral tests of drug self-administration. In addition, the project would also likely involve manipulations of genes and proteins, sectioning and analysis of brain neurons, and other related research experiences.

## 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:** Adolescent; Teen; Neuroimaging; Neuropsychological  
Assessment; Brain Development; Cannabis; Alcohol  
**Earliest Start Date:** 5/1/2019  
**Housing:** Subsidized

**Student Qualifications:** The intern should have an interest in working with children and teens.

**Project 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 has recruited over 11,000 children ages 9-10 to join the study. The overarching goal of ABCD is to determine how childhood experiences (e.g., substance use, screen time, social media, sleep, physical activity) interact with each other and with a child's changing biology to affect brain development and social, behavioral, academic, health, and other outcomes. Researchers will track their biological and behavioral development for 10 years, through adolescence into young adulthood.

# Tennessee

**Investigator:** Santosh Kumar, Ph.D.  
**Institution:** University of Tennessee Health Science Center  
Memphis, TN  
**Project Title:** Monocytic and Exosomal Cytochrome P450s in Smoking-Mediated HIV-1 Pathogenesis  
**Research:** Basic Research  
**Research Area:** HIV, Smoking, Exosomes, Cytochrome P450, Oxidative Stress  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Undergraduate students with major in biology or biochemistry and has a career interest in PhD in pharmacology, Pharmaceutical Sciences, and related areas.

**Program Description:** Our research deals with understanding of the molecular mechanism of smoking-induced HIV-1 pathogenesis. We also propose to determine the role of smoking constituents on response to antiretroviral therapy (ART). Our hypothesis is that monocytic and plasma exosomal cytochrome P450 enzymes induce smoking-mediated HIV pathogenesis and alter the response of ART drugs in peripheral system. We will use a combination of in vitro and ex vivo systems to test our hypothesis. We will test the hypothesis using aim 1: Aim 1: Contribution of monocytic CYP enzymes in tobacco-enhanced HIV-1 replication in monocyte-derived macrophages (MDM), Aim 2: Ex vivo validation of the role of CYP enzymes in smoking-enhanced HIV-1 replication, and Aim 3: Contribution of plasma exosomal CYP enzymes to HIV-1 replication in macrophages.

## Texas

**Investigator:** Anuja Ghorpade, Ph.D.  
**Institution:** University of North Texas Health Science Center  
 Fort Worth, TX  
**Project Title:** Astrocyte-TAAR1 & Meth in Hand  
**Research:** Basic Research  
**Research Area:** Affect; AIDS/HIV problem; Amines; Animal Model;  
 Astrocytes; Base; Brain; Brain Tissue; Ceftriaxone;  
 Comorbidity; Complex; CREB1 gene; Cyclic AMP; Cyclic  
 AMP-Dependent Protein Kinases; Data; Development;  
 Disease Outcome; Excitotoxicity; Exposure to; General  
 Population; Genetic Transcription; Gliosis  
**Earliest Start Date:** 4/30/2019  
**Housing:** Subsidized

**Student Qualifications:** An intern with a good understanding of cellular biology would be preferred. The intern should be open minded, independent and a critical thinker. Those interested in graduate education, including medicine and biomedical careers, would fit well into our laboratory group. No prior research experience is necessary. We work with live HIV, primary human neural cells/blood/tissues and HIV transgenic rodents, thus attention to training and detail are a must.

**Project Description:** Astrocytes are the caretakers of the brain, providing physical and metabolic support for neurons. Astrocytes become dysfunctional during both METH and HIV disease, leading to neurological impairment. We study how neurodegeneration is regulated so that we can target astrocytes to promote neural cell survival and function. The focus of this research investigates disease mechanisms downstream of a METH receptor expressed in astrocytes, including astrogliosis, oxidative stress, and excitotoxicity.

# Texas

**Investigator:** Consuelo Walss-Bass, Ph.D.  
**Institution:** University of Texas Health Science Center at Houston  
Houston, TX  
**Project Title:** Gene-Environment Interactions in Cocaine Use Disorder:  
Collaborative Case- Control Initiative in Cocaine Addiction  
**Research:** Basic Research  
**Research Area:** Gene-Environment Interactions, DNA Methylation,  
Postmortem Brain  
**Earliest Start Date:** 6/3/2019  
**Housing:** Subsidized

**Student Qualifications:** Students will work with postmortem brain tissue and blood. Students majoring in any biological science and that have basic skills in laboratory techniques such as pipetting are preferred.

**Project Description:** We propose to perform an in-depth genome-wide characterization of the influences of epigenetic modifications on gene expression in our existing cohort of addiction brain samples. We will assess DNA methylation utilizing Illumina arrays and gene expression by RNA sequencing in brain tissue from 50 subjects (25 cases and 25 controls) in 2 addiction-related brain regions (nucleus accumbens and amygdala). We will perform integrated methylation and expression analyses to identify region-specific gene expression and methylation differences in cases compared to controls, and we will correlate genomic changes with behavioral measures related to addiction, such as impulsivity and self-regulation (obtained via our detailed psychological autopsy), as well as with exposure to stressful life events (again via the psychological autopsy). These studies will lead to a better understanding of how changes in DNA methylation modulate gene expression, and whether this may be correlated with alterations in behavior and brain function, and ultimately lead to development of addiction.



# Texas

**Investigator:** Donald Dougherty, Ph.D.  
**Institution:** University of Texas San Antonio  
 San Antonio, TX  
**Project Title:** 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:** 6/10/2019  
**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:** Jia Zhou, Ph.D.  
**Institution:** University of Texas Medical Branch  
Galveston, TX  
**Project Title:** 5-HT<sub>2</sub>CR Allosteric Modulators as Novel Pharmacotherapy  
in Cocaine Use Disorder  
**Research:** Drug Development Research  
**Research Area:** Cocaine Addiction, Drug Abuse, Chemical Biology,  
Medicinal Chemistry, Small Molecules, Molecular  
Modeling, 5-HT<sub>2</sub>C Receptor, GPCR, Allosteric Modulators,  
Drug Discovery, Translational Research, Chemistry  
**Earliest Start Date:** 5/30/2019  
**Housing:** Campus

**Student Qualifications:** Previous research experience is not required. College students that have taken chemistry courses, have a safety sense of handling chemical synthesis, and are interested in chemical biology, medicinal chemistry, molecular modeling and docking, organic synthesis, and small molecule drug discovery are encouraged to apply.

**Project Description:** Our research interests are broadly based on the interface of synthetic organic chemistry and medicinal chemistry, and on the drug discovery of bioactive molecules to probe biological systems or act as potential therapeutic agents in neuroscience and drug addiction. With this general idea in mind, and in active collaboration with other biologists and pharmacologists, we would like to establish a strong and creative research program that applies state-of-the-art chemical approaches to biological problems impacting diagnosis, prevention and treatment of human diseases.

In the current project, our objective is to optimize 5-HT<sub>2</sub>CR PAMs with a favorable drug metabolism and pharmacokinetics (DMPK) profile, and analyze select molecules in proof-of-concept behavioral models to support therapeutic potential for cocaine use disorder. To accomplish our objective, we will: (1) design, synthesize and optimize 5-HT<sub>2</sub>CR PAMs; (2) define selectivity and specificity and DMPK profiles of 5-HT<sub>2</sub>CR PAMs in vitro; and (3) determine DMPK in vivo and efficacy of optimized 5-HT<sub>2</sub>CR PAMs in rodent models of impulsivity and cue reactivity. This innovative, potentially high impact small molecule development project will elucidate important new information about the chemical neurobiology of 5-HT<sub>2</sub>CR allosteric modulation, and drive new concepts and directions in cocaine use disorder and anti-relapse medications.

# Texas

**Investigator:** Josee Guindon, Ph.D.  
**Institution:** Texas Tech University Health Sciences Center  
 Lubbock, TX  
**Project Title:** Mechanisms of Cannabinoid Tolerance  
**Research:** Basic Research  
**Research Area:** Delta-9-tetrahydrocannabinol ( $\Delta$ 9-THC) and cannabis-like compounds have been used by cancer patients for its analgesic and anti-emetic effects. This study will assess agonist-specific mechanisms of cannabinoid tolerance to the antinociceptive effects using a chronic (chemotherapy-induced) pain model.  
**Earliest Start Date:** 5/30/2019  
**Housing:** Campus

**Student Qualifications:** The student should be interested in behavioral biology, pharmacology and neuroscience. This research requires the students to work with animals and tissue samples. No previous behavioral pharmacology experiences are required since the PI holds a veterinary medicine degree as well as a Ph.D. in pharmacology. She has also trained several trainees unfamiliar with behavioral and pharmacological testing. However, a strong desire to learn behavioral pharmacology and molecular biology is highly encourage.

**Project Description:** The student will use chemotherapy-induced neuropathic pain as previously described and optimized by Dr. Guindon. He will be treating mice with 4 doses of 5 mg/kg cisplatin given 1 weekly (Guindon et al., 2014). He will perform behavioral testing: mechanical (digital electro von Frey) and cold (acetone) allodynia (Guindon and Hohmann, 2013). The first part of the project will be to test daily, 60 minutes after IP injection, 0.3 mg/kg of CP55,940, 3 mg/kg of WIN55,212-2 or 6 mg/kg of  $\Delta$ 9-THC in Wild-type (WT mice) or in disrupted GRK phosphorylation of CB1 (S426A/S430A mutants) mice using the cisplatin-induced neuropathic pain model. The second part of the project will evaluate the ability of JNK signaling (3 mg/kg SP600125 or 25 mg/kg SU 3327) to modulate tolerance to 0.3 mg/kg CP55,940, 3 mg/kg WIN 55,212-2 or 6 mg/kg  $\Delta$ 9-THC in Wild-type and S426A/S430A mice. The following groups will be tested and these compounds will be given for 14 consecutive days: (1) vehicle with vehicle, (2) 3mg/kg SP600125 and vehicle, (3) 25 mg/kg SU 3327 and vehicle, (4) 3 mg/kg SP600125 and 0.3 mg/kg CP55,940, (5) 25 mg/kg SU 3327 and 0.3 mg/kg CP55,940, (6) 3 mg/kg SP600125 and 3 mg/kg WIN 55,212-2, (7) 25 mg/kg SU 3327 and 3 mg/kg WIN 55,212-2, (8) 3 mg/kg SP600125 and 6 mg/kg  $\Delta$ 9-THC and (9) 25 mg/kg SU 3327 and 6 mg/kg  $\Delta$ 9-THC. After animal testing, tissues part of pain signaling or possessing high levels of CB1 (PAG, spinal cord) will be dissected to perform molecular pharmacology (RT-PCR).

# Texas

**Investigator:** Kathryn A. Cunningham, Ph.D.  
**Institution:** University of Texas Medical Branch  
Galveston, TX  
**Project Title:** ELII: 5-HT<sub>2C</sub> Receptor Allosteric Modulators for Novel  
Pharmacotherapy  
**Research:** Basic Research  
**Research Area:** Addiction Research; Addiction Sciences; Pharmacology;  
Toxicology; Neuroscience  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Excitement about science; Team Player; preferred background in Neuroscience, Psychology, Pharmacology, or Behavioral Science; Understanding of the importance of animal research to advancing our understanding of addiction.

**Project Description:** The University of Texas Medical Branch at Galveston houses The Center for Addiction Research (CAR), a center focused on uncovering the biological, behavioral and chemical determinants of Substance Use Disorders (SUDs). The CAR research teams use a multi-pronged approach to be at the frontier of SUD research and provide a sustainable training environment for future scientists. A summer research intern can expect to interrogate the role of serotonin (5-HT), 5-HT<sub>2A</sub> receptor (5-HT<sub>2A</sub>R), and 5-HT<sub>2C</sub> receptor (5-HT<sub>2C</sub>R) in SUDs. Currently, there are no FDA-approved medications for cocaine use disorder, which provides the foundation to explore manipulations to the 5-HT<sub>2C</sub>R, because 5-HT<sub>2C</sub>R activation reduces cocaine relapse behavior in rodents. Challengingly, because the 5-HT<sub>2A</sub>R and 5-HT<sub>2C</sub>R have similar binding pockets for 5-HT, targeting a common binding pocket results in undesired effects. To combat this, the research team targeted another binding area of the 5-HT<sub>2C</sub>R that does not share binding properties with the 5-HT<sub>2A</sub>R using newly synthesized small molecules. The research team designed small molecules that selectively target the alternative binding site and potentiate 5-HT<sub>2C</sub>R signaling without 5-HT<sub>2A</sub>R activation. The innovative nature of this project requires a multidisciplinary research team to which the summer research intern will be experience. The long-term mission is to provide a rich training environment and develop therapeutics to reduce SUDs.

# Texas

**Investigator:** Kayo Fujimoto, Ph.D.  
**Institution:** University of Texas Health Science Center at Houston  
Houston, TX  
**Project Title:** HIV Intervention Models for Criminal Justice Involved  
Substance-Using Black MSM  
**Research:** Behavioral Research  
**Research Area:** HIV, Men Who Have Sex with Men, Sexual and Gender  
Minorities, Social Network, Sexual Network, Criminal  
Justice, Jail  
**Earliest Start Date:** 4/30/2019  
**Housing:** Subsidized

**Student Qualifications:** Interns must have an interest in HIV, sexual and gender minority health, or the criminal justice system. A prior experience with or courses in qualitative or quantitative research is preferred.

**Project Description:** The research project looks at the changes in the social and sexual networks among for young Black men who has sex with men involved in the criminal justice system, at risk or living with HIV. Depending on the student's interests, skills, and experience, assignments may include transcribing, coding, and abstracting qualitative data, inputting, organizing, and preliminary analysis of quantitative data, recruiting and scheduling study participants, helping prepare for data collection, supporting data collectors in the field, and conducting interviews with research participants. The student will meet at least monthly with the faculty supervisor(s) to evaluate progress

# Texas

**Investigator:** Laura O'Dell, Ph.D.  
**Institution:** University of Texas at El Paso  
El Paso, TX  
**Project Title:** SMART MINDS (Summer Mentoring and Research  
Training: Methods in Neuroscience of Drug Abuse)  
**Research:** Basic Research  
**Research Area:** Neuroscience; Drug Abuse; Tobacco Use; Addiction; In  
Vivo Micro Dialysis; Behavior; Molecular Biology  
**Earliest Start Date:** 5/25/2019  
**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:** Lidong Qin, Ph.D.  
**Institution:** Houston Methodist Hospital  
Houston, TX  
**Project Title:** Development of a Point-of-Care Volumetric Bar-Chart Chip  
for Drug Quantitation  
**Research:** Basic Research  
**Research Area:** Microfluidics; Bioengineering; Lab on a Chip; Cell Assay  
**Earliest Start Date:** 6/1/2019  
**Housing:** Subsidized

**Student Qualifications:** GPA 3.0  
Credits in chemistry, physics, biochemistry, and cell biology.

**Project Description:** We will provide an opportunity of summer intern students to learn state of the art drug analysis and platform developments. We will demonstrate how a clinical sample is assayed in a laboratory setup. Our unique strength is that we have an institute wide undergraduate Summer Intern program with a class size of 50, providing classes, lectures, training, communications, and housing.

# Vermont

**Investigator:** Hugh Garavan, Ph.D.  
**Institution:** University of Vermont  
Burlington, VT  
**Project Title:** ENIGMA- Addiction: Pooling of Existing Datasets to Identify Brain and Genetic Correlates of Addiction  
**Research:** Basic Research  
**Research Area:** Neuroimaging; Addiction; Meta-analysis  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Interns will work with neuroimaging (fMRI) data but can also gain experience testing human participants at the MRI scanner if they wish. A background in Psychology or Neuroscience, or in Mathematics, Computer Science, or Engineering would be suitable. Comfort with data analyses is a must, experience with programming is not necessary but highly desirable.

**Project Description:** The lab conducts research on the neurobiology of substance abuse. For the ENIGMA-Addiction project we work with large datasets contributed from consortium members around the globe. The primary analyses are on brain structure but we will extend into analyses of brain function. In addition, we work with several large longitudinal datasets including IMAGEN (<https://imagen-europe.com>) and ABCD (<https://abcdstudy.org>). There is very rich psychological characterization in these datasets so interns can typically choose a topic of interest to themselves.



# Virginia

**Investigator:** Fatah Kashanchi, Ph.D.  
**Institution:** George Mason University  
Manassas, VA  
**Project Title:** Role of Extracellular Vesicles in Methamphetamine and HIV  
Induced Neurotoxicity  
**Research:** Basic Research  
**Research Area:** Drug Abuse; Exosomes; HIV/AIDS  
**Earliest Start Date:** 6/3/2019  
**Housing:** Campus

**Student Qualifications:** GPA = 3.5

Prerequisite courses: Chemistry, Biology, Microbiology, Cell Biology, and Biochemistry.

**Project Description:** These experiments will address if Nef (HIV viral protein) is responsible for increasing Extracellular vesicle (EV) release after HIV infection in relation to Methamphetamine abuse. EVs will be isolated and separated from HIV virions using Dr. Kashanchi's gradient purification and nanotrap based isolation and separation method as well as differential centrifugation. EVs from different conditions (uninfected immune cells, +/- Meth; HIV (Nef+ and Nef- deletion mutant initially) infected immune cells, +/- Meth, will be examined for particle number, size and shape using Nanoparticle Tracking Analysis (NTA), and Electron Microscopy.

# Virginia

**Investigator:** Kathryn Polak  
**Institution:** Virginia Commonwealth University  
Richmond, VA  
**Project Title:** Using Mobile-Based Contingency Management to Promote Daily Self-Monitoring of Pain Severity and Prescription Opioid Use in a Primary Care Sample of Chronic Pain Patients.  
**Research:** Clinical Research  
**Research Area:** Chronic Pain; Pain Management; Prescription Drug Misuse; Prescription Drug Overuse; Drug Misuse; Analgesics, Opioid; Narcotics; Opioid-Related Disorders; Contingency Management; Mobile Applications  
**Earliest Start Date:** 5/20/2019  
**Housing:** Subsidized

**Student Qualifications:** Required: A curious mind and motivation to learn and work hard on the research project. Must maintain at least a 3.0 GPA. Desired: Some science background (e.g., a high school level course in biology, psychology, and/or chemistry).

**Project Description:** Responsible opioid prescribing depends on effective identification of prescription (Rx) opioid misuse as well as an understanding of clinically-relevant variables (e.g., pain). Remote self-monitoring is a promising, practical, and readily available method for tracking these variables; however, low rates of adherence have impeded the use of remote self-monitoring among chronic pain patients, limiting the potential beneficial effects. The present study is examining the efficacy and feasibility of contingency management (CM; as delivered by an innovative CM app) for improving self-monitoring of clinically-relevant variables among chronic pain patients, which will inform future research on effective pain management, early identification of Opioid Use Disorders, and adherence across a variety of medical conditions.

# Virginia

**Investigator:** M. Imad Damaj, Ph.D.  
**Institution:** Virginia Commonwealth University  
Richmond, VA  
**Project Title:** Genetics Basis of Nicotine Withdrawal in a Reduced Complexity Cross  
**Research:** Basic Research  
**Research Area:** Nicotine Addiction Research in Animal Models; Behavioral Genetics; Pain and Neuropathy; Role of Nicotinic Receptors in Behaviors; Adolescent Exposure to Drugs of Abuse  
**Earliest Start Date:** 4/1/2019  
**Housing:** Subsidized

**Student Qualifications:** Science background; Motivation and interest in research; Experience with animal behavioral testing is a plus; Experience in a research Lab is a plus

**Project Description:** The impact of nicotine and alcohol adolescent exposure on reward and withdrawal later in life in mice. Adolescents appear to be particularly vulnerable to initiate the use of tobacco and other nicotine containing products. This proposal is focused on the long-term impact resulting from initiation of the use of oral nicotine delivery systems such as snus products and dissolvable tobacco products during adolescence on alcohol dependence and behaviors alter in life. A central goal of the experiments described in this summer project is to examine the impact of oral nicotine consumption during adolescence in mice on alcohol intake and preference as well as alcohol withdrawal intensity in young adult animals, testing the general hypothesis that decreasing the nicotine content in oral products will prevent the development of alcohol addiction later in life.

# Virginia

**Investigator:** Wendy Lynch, Ph.D.  
**Institution:** University of Virginia  
Charlottesville, VA  
**Project Title:** Exercise as a Sex-Specific Intervention Strategy for Cocaine  
Addiction  
**Research:** Behavioral Research  
**Research Area:** Sex Differences, Cocaine Addiction, Rat Model, Exercise,  
Intervention, Relapse  
**Earliest Start Date:** 5/29/2019  
**Housing:** Campus

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

**Project Description:** Exercise is a promising treatment for addiction that reduces withdrawal symptoms and prevents relapse in both men and women. However, its effects can be variable with evidence suggesting that some exercise conditions are not effective. This project will use a rat model of cocaine addiction to determine how to maximize the beneficial effects of exercise for treating cocaine addiction focusing on sex-specific differences.

## Washington

<b>Investigator:</b>	Katherine Anne Comtois, Ph.D., MPH
<b>Institution:</b>	University of Washington Seattle, WA
<b>Project Title:</b>	Preventing Addiction Related Suicide (PARS) - Controlled Trial of Secondary Suicide Prevention
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Suicide Prevention; Secondary Prevention; Addictions; Help-Seeking; Treatment Development; Group Therapy
<b>Earliest Start Date:</b>	4/29/2019
<b>Housing:</b>	Subsidized

**Student Qualifications:** Pursuing a Bachelor's degree in psychology, social sciences, or other related field; completing coursework in research methods or a year of research experience; evidence of strong interpersonal skills and competence communicating and working with the research team and a diverse community of chemical dependency providers and clients; and a flexible schedule to be able to participate in client recruitment at morning or evening groups.

**Project Description:** The University of Washington Department of Psychiatry and Behavioral Sciences has an outstanding opportunity for a summer intern. This individual will assist the PI, study coordinator, and other study staff with a large NIDA-funded pragmatic clinical trial evaluating the effectiveness and utility of Preventing Addiction Related Suicide (PARS). PARS are a psychoeducational suicide prevention program designed to be used within Intensive Outpatient Programs (IOPs), the most widely available modality of community addiction treatment. The study aims to evaluate the effectiveness and utility of PARS utilizing a novel, randomized stepped wedge design. If proven effective, PARS will allow community addiction treatment agencies to be key players in the national suicide prevention strategy by helping one of the most high-risk suicidal populations in the country. This study will recruit 900 clients in six waves of 150 clients each and assure completion of 1-, 3-, and 6-month follow-up online or phone assessments. The intern will work under the general direction of the study coordinator and investigators and work collaboratively with the team to ensure project aims are being met in a timely matter.

# Washington

<b>Investigator:</b>	Mary Hatch-Maillette, Ph.D.
<b>Institution:</b>	University of Washington Alcohol & Drug Abuse Institute Seattle, WA
<b>Project Title:</b>	Clinical Trials Network - Pacific Northwest Node
<b>Research:</b>	Clinical Research
<b>Research Area:</b>	Addiction Treatment, Clinical Research, Implementation Science, Clinical Trials, Substance Abuse, HIV, Opioid Use Disorder, Emergency Department
<b>Earliest Start Date:</b>	6/23/2019
<b>Housing:</b>	Campus

**Student Qualification:** This internship is geared toward undergraduates who are interested in seeing how addiction and related issues (opioid use, HIV, sexual risk, etc.) are treated and researched in real world settings. Interns will not be working directly with patients or participants, but will have some experiences shadowing those who are. Students who are considering careers in medicine, psychology, social work, or public health will be a good fit.

**Project Description:** The Pacific Northwest Node (PNW) of the NIDA Drug Abuse Treatment Clinical Trials Network (CTN), housed at the University of Washington Alcohol & Drug Abuse Institute, welcomes a NIDA Summer Intern to learn about substance abuse treatment clinical research. This 5-week internship will focus on two CTN studies: one occurring at Harborview Medical Center, Seattle's Level I trauma center, focusing on improving buprenorphine treatment access for opioid use disorder in the Emergency Department, and the other working with a lead investigative team based at ADAI, launching an implementation survey study to assess Pre-Exposure Prophylaxis and opioid-related service availability for men who have sex with men in high-HIV-incidence Southeastern US cities. Specific projects might be working with the lead investigative team to develop a coding manual for qualitative interviews of directors whose agencies serve those at high HIV risk, or beta testing attitudinal surveys developed for men who have sex with men and their treatment providers. The intern will gain exposure and experience with addiction clinical research via a variety of experiences such as shadowing in the ED, touring community treatment programs, participating on conference calls, conducting literature searches, preparing research materials, and attending webinars and presentations available through the Northwest Addiction Technology Transfer Center (NWATTC) and the UW Center for AIDS Research (CFAR).

# Washington

**Investigator:** Ming Xian, Ph.D.  
**Institution:** Washington State University, Pullman  
Pullman, WA  
**Project Title:** Understanding Opioid Dependence and Hydrogen Sulfide  
**Research:** Basic Research  
**Research Area:** Organic Chemistry, Synthesis, Fluorescent Sensors,  
Chemical Biology  
**Earliest Start Date:** 5/13/2019  
**Housing:** Campus

**Student Qualifications:** The preferred intern should have some background in chemistry. He/she should have taken and passed related courses in chemistry, in particular analytic chemistry, biochemistry, and two semesters' organic chemistry. Having some research experience is a plus. This research does not involve animal or human samples.

**Program Description:** Opioids are used in treating chronic pain but have adverse effects including problematic issues of tolerance, dependence, and opioid-induced hyperalgesia. The best-established mechanism of opioid dependence is the up-regulation of adenylyl cyclase (AC)/cAMP pathway. Recent studies revealed that hydrogen sulfide (H<sub>2</sub>S) can effectively attenuate the development of opioid dependence via down-regulation of the AC/cAMP pathway. However, H<sub>2</sub>S's exact mechanisms of action are still unclear, and the actual H<sub>2</sub>S concentration and flux which exhibit the optimal inhibition of opioid dependence have yet to be determined. This lack of knowledge presents a major burden in the development of H<sub>2</sub>S based therapy. In this summer internship project, the student will work with a senior graduate student in my lab to synthesize and evaluate several novel and highly sensitive H<sub>2</sub>S fluorescent sensors. The most promising sensor(s) will be used to determine H<sub>2</sub>S concentration changes in cell models of opioid dependence. We expect the optimal H<sub>2</sub>S flux causing effective inhibition of opioid dependence will be identified.

## West Virginia

**Investigator:** Brandon Henderson, Ph.D.  
**Institution:** Joan C. Edwards School of Medicine at Marshall University  
 Huntington, WV  
**Project Title:** Characterization of Menthol's Effect on Nicotine  
 Reinforcement and Nicotinic Receptor Neurobiology  
**Research:** Basic Research  
**Research Area:** Addiction; Tobacco; Menthol; Dopamine Neurons; Animal  
 Behavior; Fluorescence Microscopy  
**Earliest Start Date:** 5/31/2019  
**Housing:** Campus

**Student Qualifications:** Qualifications include: cell culturing experience, general pipeting skills, and basic computer skills. My research requires students to work with mice.

**Project Description:** Nicotine, the primary addictive component of tobacco products, is one of the most heavily used drugs of abuse in the United States. It is estimated that a third of the U.S. population uses cigarettes, cigars and or chewing tobacco products. This results in ~440,000 premature deaths each year and an annual cost of more than \$75 billion in direct medical charges. Menthol is the only remaining legal cigarette flavorant; but smokers of menthol cigarettes have lower quit rates. This has suggested that menthol may enhance nicotine reward; but how this occurs is unknown. To compound this problem, electronic nicotine delivery systems (ENDS), which allow a multitude of flavors, are becoming increasingly popular. It is becoming increasingly important to study how flavors play a role in the addiction to nicotine.

Our work has found that menthol enhances nicotine reward-related behavior (addiction) in mice. Our current and future work will focus on studying how tobacco flavorants, such as menthol, alter cellular mechanisms that are involved with addictive behavior. Summer students will receive training in general cell culture methods, quantitative microscopy, tissue sectioning, and immunohistochemistry. Depending on time and student preference, experiments with mouse models is an option as well. Our goal is to give students adequate experience in common biomedical techniques that will provide an excellent foundation for a future biomedical scientist.



## West Virginia

**Investigator:** Steven Kinsey, Ph.D.  
**Institution:** West Virginia University  
Morgantown, WV  
**Project Title:** Reducing the Deleterious Effects of Synthetic Cannabinoid  
Withdrawal on Emotionality & Motivation  
**Research:** Behavioral Research  
**Research Area:** Cannabinoid; Anxiety; Depression; Drug Withdrawal  
**Earliest Start Date:** 5/13/2019  
**Housing:** Campus

**Student Qualifications:** Research will require working with mice and tissue samples.

**Project Description:** Despite the unknown risks and sales bans, synthetic cannabinoid use has increased in recent years. Cannabinoid dependence causes emotional changes including increased anxiety and depression, which contribute to relapse. These studies will use mouse models to target cannabinoid receptors in the brain to alter emotional and motivational changes caused by cannabinoid use, with the goal of informing synthetic drug dependence research and therapies for people.

# Wisconsin

<b>Investigator:</b>	Lauren Papp, Ph.D.
<b>Institution:</b>	University of Wisconsin-Madison Madison, WI
<b>Project Title:</b>	Real-Time Predictors of Prescription Drug Misuse by College Students and Assessment of Misuse on the Developmental Trajectories
<b>Research:</b>	Behavioral Research
<b>Research Area:</b>	Prescription Drug Abuse; Ecological Momentary Assessment; Interpersonal Relations; College; Stressor; Interpersonal Relations; Emotions; Development
<b>Earliest Start Date:</b>	5/20/2019
<b>Housing:</b>	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.

**Project 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.

# Wisconsin

**Investigator:** Ryan Westergaard, M.D., Ph.D., MPH  
**Institution:** University of Wisconsin-Madison  
 Madison, WI  
**Project Title:** Community-Based, Client-Centered Prevention Homes to  
 Address the Rural Opioid Epidemic  
**Research:** Epidemiology Research  
**Research Area:** Behavioral and Social Science; Brain Disorders; Clinical  
 Research; Prescription Drug Abuse; Prevention; Rural  
 Health; Substance and Drug Abuse; Emerging Infectious  
 Diseases; HIV/AIDS; Health Disparities; Health Services;  
 Hepatitis; Hepatitis - C; Infectious Diseases; Liver Disease;  
 Minority Health  
**Earliest Start Date:** 6/1/2019  
**Housing:** Campus

**Student Qualifications:** Preferred candidates will be studying public health, social work, medicine, and related fields. The intern will be working with human subjects and should demonstrate excellent written and oral communication skills, an ability to work independently and effectively under general supervision, initiative and creativity on the job along with the ability to problem solve, and a compassionate, nonjudgmental, and respectful approach to vulnerable populations.

**Project Description:** The Division of Infectious Diseases at the University of Wisconsin is seeking a NIDA Research Intern to assist with a community health research project. This research is a collaboration between the University and the AIDS Resource Center of Wisconsin. The goal of the study is to develop community-based interventions to prevent HIV, viral hepatitis and opioid overdose among people who inject drugs. This research and training opportunity will involve daily interaction with field staff who provide prevention services to clients with substance use disorders, including syringe exchange, naloxone-based overdose prevention, and risk reduction counseling. This is a multi-site study, offering the possibility of placement in several different communities, depending on project needs and candidate preferences. While the PI and the research team are in Madison, the candidate may have the opportunity to live and work in or near one of the following seven Wisconsin communities: Superior, Eau Claire, La Crosse, Wausau, Appleton, or Green Bay.