National Institute on Drug Abuse



Summer Research Internship Program

For

Underrepresented Students



Program:

The NIDA summer research internship program supports students from populations underrepresented in the sciences (American Indian/Alaska Native, Black/African American, Hispanic/Latino, Native Hawaiian/Pacific Islander), to pursue careers in biomedical and behavioral research. Through this program, high school and undergraduate students are introduced to the field of substance 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 8 weeks during the summer. The internship may include laboratory experiments, data collection, data analysis, formal courses, participation in lab meetings, patient interviews, manuscript preparation, library research, and literature reviews. In addition, it is expected that each intern will deliver a formal presentation on his/her research project at the end of the internship.

The NIDA Summer Research Internship Program is in its 20th year. Since the program's inception in 1997, more than 930 students have gained experience in substance abuse and addiction research.

Eligibility:

This program supports summer research internships for high school and undergraduate students who are from racial/ethnic populations that are nationally underrepresented in the biomedical, behavioral, and clinical sciences (American Indian/Alaska Native, Black/African American, Hispanic/Latino, Native Hawaiian/Pacific Islander), although students from any race/ethnicity may apply. Graduating 2016 college seniors are eligible to apply.

Applicants must be at least 16 years of age (unless a specific project indicates otherwise) and must be U.S. citizens or permanent residents of the United States (No Exceptions). Applicants under the age of 18 can only be placed at research sites within daily-commuting distance (25 miles or less) from their home.

Individuals who have already participated in the NIDA Summer Research Internship Program for two summers are not eligible to apply.

Scope of Support:

- High school students will receive stipends in the amount of \$10.00 per hour for a maximum stipend of \$3,200 for 8 weeks.
- Undergraduate students, including graduating high school seniors enrolled in college for the fall, will receive stipends in the amount of \$12.00 per hour for a maximum stipend of \$3,840 for 8 weeks.
- Please note that the research site you are matched with will work with you to arrange your schedule, method of payment, and any other logistics such as housing only if it is offered at that site.

Distant Sites:

Only students who are 18 years old and older may be placed at sites greater than 25 miles (distant site) from their permanent residence. In cases where students are placed at distant sites, investigators can request up to \$3,000 for travel, costs associated with lodging and per diem expenses for these students. In most cases, investigators/research sites will locate/secure housing for students, but this is not always the case. If lodging is available at the research site, it is indicated in the site description. On-campus housing is not available for students under 18 years old or for undergraduate students who live within daily commuting distance of their assigned internship site.

Application Procedures:

To apply for this program fill in all sections of the application form. Prior to making your research site selections, review the research projects and locations listed in the online brochure (<u>www.drugabuse.gov/pdf/sposummer.pdf</u>). After reviewing the descriptions, indicate on the application the top three sites that best match your research interests and experience. All efforts will be made to match applicants at one of their top three choices.

Application components include:

- A completed application form
- current transcripts (unofficial transcripts are acceptable)
- two letters of recommendation

***You may edit, save, and submit your application as often as needed up to the deadline and the application will update each time. Your references will be contacted when you submit your application.

All application materials must be submitted by Wednesday, February 10, 2016.

Application Review and Selection:

Interns are selected according to the following criteria:

- Professional/Career Goals
- Research Interests
- Academics Achievement
- Letters of Recommendation
- Program Priorities

Contact:

For further information please contact Julie Huffman, <u>huffmanj@mail.nih.gov</u>, phone 301-443-9798.

Program Director, Albert Avila, Ph.D., aavila@nida.nih.gov

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|------------|--|---|----------------|----------------------|----------------------------|---------------------------|
| Arizona | University of Arizona | Novel NonPeptide Opioids for Pain | 1 | X | | Х |
| Arkansas | University of Arkansas for Medical Sciences | A risk Factor Analysis of Human Brain States Related to Development Addiction | 2 | X | | X |
| California | University of California, San Francisco | RCT of an Integrative Intervention for Non-Treatment- Seeking Meth Users | 3 | X | | X |
| California | University of California, Los Angeles | Homeless Female Offenders Returning to the Community: Improving Hopeful Futures | 4 | X | | X |
| California | University of California, San Francisco | Digital Health Technology Use among Methadone Maintenance Patients | 5 | X | | X |
| California | The Scripps Research Institute | Methamphetamine and Adult Hippocampal Neurogenesis | 6 | | Х | X |
| California | University of California, Irvine | Characterization of Anadamide Transport in Brain | 7 | | | X |
| California | University of California, San Francisco | Marketing, FDA Communications, Tobacco Perceptions and Use in Addiction Treatments | 8 | Х | | X |
| California | The Scripps Research Institute | Methamphetamine and HIV Interactions in the Regulation of Glial Activation | 9 | | | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|-------------------------|--|--|----------------|----------------------|----------------------------|---------------------------|
| California | University of California Irvine | Effect of Exposure to Nicotine Vapor on the Vulnerability to Nicotine Dependence | 10 | X | | X |
| California | University of California Irvine | Role of Ventral Pallidum Projection to VTA in Reinstatement of Cocaine Seeking | 11 | X | | X |
| California | UCLA Center for Behavioral & Addiction Medicine | Combating craving with contingency management: neuroplasticity and MA abuse in So. Africa | 12 | X | | X |
| California | University of California, San Francisco | Developing Tools to Understand the Neuromodulation of Hypothalamic Function | 13 | | | X |
| California | Charles R. Drew University of Medicine & Science | Drew MIDARP (Infrastructure in Drug Abuse Research) | 14 | | | X |
| Connecticut | Yale University | Expanding Medication-Assisted Therapies in Ukraine | 15 | X | | X |
| Connecticut | Yale University | Three Strategies for Implementing Motivational Interviewing on Medical Inpatient Units | 16 | | X | X |
| Connecticut | Yale University | Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers | 17 | | | X |
| District of Columbia | Children's National Medical Center | Development of the Basal Telencephalic Limbic System | 18 | | Х | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|---------------|---|---|----------------|----------------------|----------------------------|---------------------------|
| Florida | The Scripps Research Institute | Synthesis and Evaluation of Functionally Biased Opioid Analgesics | 19 | x | | X |
| Florida | University of Florida | ABCD-USA Consortium: Research Project | 20 | | X | X |
| Georgia | Georgia State University | The Science of Decision Making: Connecting People to Policy | 21 | X | | X |
| Hawaii | Hawaii Pacific University | The Development and Evaluation of the Ho'ouna Pono Drug Prevention Curriculum | 22 | | | X |
| Illinois | Northwestern University | Multilevel Influences on HIV and Substance Use in a YMSM Cohort | 23 | | | x |
| Illinois | University of Chicago | Social Network Dynamics, HIV, and Risk Reduction Among Younger Black MSM | 24 | X | | X |
| Illinois | University of Illinois at Chicago | Emotion Dysregulation and Risky Behavior Among People Who Inject Drugs | 25 | | | X |
| Iowa | University of Iowa | Isolating the Extinction Circuit for Cocaine Seeking | 26 | X | X | Х |
| Kentucky | University of Kentucky | Development of Long-Acting Cocaine Hydrolase as a Treatment for Cocaine Abuse | 27 | X | X | x |
| Maine | The Jackson Laboratory | Discovery of Addiction-Related Genes with Advanced Mouse Resources | 28 | | | X |
| Massachusetts | Boston University School of Medicine | Genetic Basis of Opioid Reward and Aversion in Mice | 29 | x | | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|---------------|---|--|----------------|----------------------|----------------------------|---------------------------|
| Massachusetts | Boston Medical Center | Transforming Opioid Prescribing in Primary Care | 30 | | | X |
| Massachusetts | Boston University Schools of Medicine and Public Health; Boston Medical Center | Improving Physician Opioid Prescribing for Chronic Pain in HIV-infected Persons | 31 | | | X |
| Massachusetts | Massachusetts General Hospital | International Latino Research Partnership | 32 | | | X |
| Michigan | University of Michigan | Intergenerational transmission of Drug Use in an Urban Sample | 33 | X | | X |
| Michigan | University of Michigan | Integrated GWAS of complex Behavioral and Gene Expression Traits in Outbred Rats | 34 | X | | X |
| Michigan | University of Michigan | Visualization of Combinatorial Epigenetic Marks and Complexes in Animals | 35 | X | X | х |
| Missouri | Washington University | Nicotine Dependence to Smoking Cessation: Sequencing Common and Rare | 36 | Х | | X |
| Missouri | Washington University | Genetically Informed Smoking Cessation Trial | 37 | X | Х | X |
| Missouri | Washington University School of Medicine | Implications of Social Media Content and Engagement for Alcohol and Marijuana Use | 38 | | X | X |
| Nebraska | University of Nebraska Medical School | HIV Tat & Cocaine- Mediated Induction of Astrogliosis: Role of ER Stress in HAND | 39 | X | | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School | Undergraduate Students |
|------------------|---|--|----------------|----------------------|----------------|---------------------------|
| | | | | | Students | |
| New Hampshire | Dartmouth College | Behavioral Treatment of Adolescent Marijuana Use | 40 | X | | X |
| New York | Weill Cornell Medical College of Cornell University | The Role Of Cav1.2 L-Type Ca2+ Channels In Cocaine-Induced Reinstatement | 41 | X | | X |
| New York | State University of New York at Stony Brook | Calcium-related Neurotoxicity of Cocaine | 42 | X | | X |
| New York | Columbia University | Substance Use/Abuse & HIV/STI Risk Behaviors in Puerto Rican Youth | 43 | | | X |
| New York | NYU School of Medicine | Longitudinal Pathways to HIV Risk Behaviors Among African American and Latina Women | 44 | | | X |
| New York | National Development and Research institutes, Inc. | Bath Salts & the Illicit Drug Market: Use, Violence & Health | 45 | | | X |
| New York | Columbia University | Translational Research on Interventions for Adolescents in the Legal System | 46 | | | X |
| New York | State University of New York at Buffalo | Substance Use in Reservists: Social and Environmental Influences | 47 | X | | X |
| New York | Icahn School of Medicine at Mount Sinai | Escalation of Cocaine Self- Administration in Mice | 48 | | | X |
| New York | University at Buffalo | Integrated GWAS of Complex Behavioral and Gene Expression Traits in Outbred Rats | 49 | x | x | x |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|-------------------|---|---|----------------|----------------------|----------------------------|---------------------------|
| New York | Center for Health, Identity, Behavior & Prevention Studies (CHIBPS) | Syndemic Production Among Emergent Adult Men | 50 | X | X | X |
| New York | University of Rochester | Comparative Transcriptomic Signatures of Inhaled Tobacco | 51 | X | | X |
| New York | NYU School of Medicine | Combined Cocaine and HIV Vaccine | 52 | | x | X |
| New York | Icahn School of Medicine at Mount | Neurodevelopmental Effects of Cannabis | 53 | | | Х |
| North Carolina | University of North Carolina Chapel Hill | Contributions of Glial Glutamate Transport and Transmission to Drug Abuse | 54 | X | | X |
| North Carolina | University of North Carolina | Organismal and Genetic Networks in Drug Reward and Reinforcement | 55 | | | X |
| North Carolina | University of North Carolina Wilmington | Drugs of Abuse and Memory Span | 56 | x | X | X |
| Ohio | The Ohio State University | Suicide Prevention among Substance Abusing Homeless Youth | 57 | X | | Х |
| Oregon | University of Oregon | Targeting Neurobiological & Behavioral Mechanisms of Self- Regulation in High- Risk Families | 58 | X | | X |
| Oregon | University of Oregon | Parenting to Prevent Substance Use in Late Adolescence | 59 | | | Х |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|-------------------|---|--|----------------|----------------------|----------------------------|---------------------------|
| Oregon | Oregon Research Institute | Peer Influence and Selection Mechanisms Underlying Adolescent Problem Behaviors | 60 | X | X | X |
| Oregon | University of Oregon | Siblings Reared Apart: A Naturalistic Cross- Fostering Study of Young Children | 61 | | | X |
| Pennsylvania | University of Pennsylvania | Vietnam Study | 62 | X | Х | Х |
| Pennsylvania | Drexel University | Modulation of norepinephrine by cannabinoids | 63 | X | Х | X |
| Pennsylvania | Temple University | Project 1 Reciprocal Interaction of Cocaine and Hiv-1 on Glycolytic Pathways in Macrophages and | 64 | X | | X |
| Pennsylvania | Temple University | Opioids, HIV/HCV and Host Cell Innate Immunity | 65 | | | X |
| Puerto Rico | University of Puerto Rico Medical Sciences Campus | Diversity-promoting Institutions Drug Abuse Research Program(DIDARP) | 66 | | | X |
| South Carolina | Medical University of South Carolina (MUSC) | Relapse to Cocaine- Seeking: Cellular Adaptations in the VTA | 67 | | | X |
| Tennessee | East Tennessee State University | Nicotine and the Roles of Nicotinic Receptors in a Rodent Model of Schizophrenia | 68 | x | | x |
| Texas | The University of Texas Health Science Center at San Antonio | Relating Brain Maturation to Impulse Control and Substance use Development | 69 | | | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|------------|--|--|----------------|----------------------|----------------------------|---------------------------|
| Texas | University of Texas San Antonio | Mechanisms of Cocaine Hypersensitivity Following Chronic DBH Inhibition | 70 | | x | X |
| Texas | University of Texas Medical Branch | 5-HT2CR Allosteric Modulators as Novel Pharmacotherapy in Cocaine Use | 71 | X | | X |
| Texas | University of Texas Medical Branch | Translational Addiction Sciences Center: Administration, Communication, and Integration Core | 72 | X | | X |
| Texas | University of Texas at El Paso | Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal | 73 | X | | X |
| Virginia | Virginia Tech | Novel Nanovaccines Against Nicotine Addiction | 74 | X | | X |
| Virginia | George Mason University | In-Person Motivational Interviewing (MI) vs. a Motivational Computer Program (MC) for Probationers | 75 | Х | | X |
| Virginia | George Mason University | Borderline Personality and Inmates' Post- release Substance Abuse and HIV Risk Behavior | 76 | X | | X |
| Washington | Fred Hutchinson Cancer Research Center | Modulating the Impact of Critical Events in Early HIV Infection: Effect of ART Initiation and Alcohol Use | 77 | | | X |
| Washington | University of Washington | Mechanisms of Drug Disposition During Pregnancy | 78 | X | | X |

| State | Site Name | Project Title | Site Number | Housing Available | High School Students | Undergraduate Students |
|-----------|------------------------------------|---|----------------|----------------------|----------------------------|---------------------------|
| Wisconsin | Medical College of Wisconsin | Mild TBI: Effects on Addiction- Related Phenotypes and Mesocorticolimbic Function | 79 | X | X | X |
| Wisconsin | Marquette University | Glucocorticoid- Regulated Endocannabinoids and Stress- Potentiated Cocaine Seeking | 80 | X | | X |
| Wisconsin | Marquette University | Glucocorticoid Regulation of Dopamine Clearance, Cocaine Seeking, and Reward | 81 | X | | X |

<u>Arizona</u>

| Victor Hruby, Ph.D. |
|---|
| University of Arizona |
| Novel Non-Peptide Opioids for Pain |
| Drug Development Research |
| Peptidomimetic Ligand Design, Peptide Mimetics, Synthesis, Molecular Pharmacology, Structure-Biological Activity Studies |
| 6/1/2015 |
| Yes |
| Undergraduate |
| None Listed |
| |

Student Qualifications: Prefer an undergraduate with experience in science, preferably chemistry, biochemistry, neuroscience or pharmacology working towards a Bachelor of Science degree. Will not be working with animals, humans and/or tissue samples.

Program Description: A good project is to work on the synthesis of novel ligands that are designed to have agonist activity at mu opioid receptors, agonist or antagonist activity at delta opioid receptors, and/or kappa opioid antagonist activity all in a single or bivalent ligand, to purify the ligands using HPLC and other methods, to determine purity and structure using HPLC, TLC, mass spectrometry and NMR. Finally, as time permits, to help determine binding affinities and efficacies.

<u>Arkansas</u>

| Investigator: | Clinton D. Kilts, Ph.D. |
|--------------------------|---|
| Institution: | University of Arkansas for Medical Sciences |
| | Little Rock, AR |
| Project Title: | A Risk Factor Analysis of Human Brain States Related to |
| | Development of Addiction |
| Research: | Basic Research |
| Research Area: | Individual Differences, Neuroimaging, Cognition, |
| | Addiction Risk Factors, Adolescence, and Trauma |
| | Exposure |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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 how variance in brain structure and brain function contributes to individual differences in trajectories of drug use disorders in at-risk adolescents. There will be opportunities to interact and learn with the medical students, graduate students, postdoctoral fellows and psychiatry residents currently participation 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: | Adam Carrico, Ph.D. |
|--------------------------|---|
| Institution: | University of California, San Francisco |
| Project Title: | RCT of an Integrative Intervention for Non-Treatment- |
| | Seeking Meth Users |
| Research: | Clinical Research |
| Research Area: | Psychoneuroimmunology; Neuroimmune pharmacology; |
| | HIV/AIDS Prevention; Lesbian, Gay, Bisexual and |
| | Transgender (LGBT) Health Disparities |
| Earliest Start Date: | 5/23/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Although students with at least one year of research experience are preferred, no prior experience is required. Undergraduate students majoring in Nursing and Psychology are strongly encouraged to apply.

Program Description: The intern will assist with day-to-day operations at the study field site gaining experience with cleaning study data, transporting biological specimens, conducting study assessment visits, and joining meeting with our community partner (a substance abuse treatment program serving men who have sex with men). In collaboration with the study PI and postdocs, the intern will also complete a small, independently conceived research project using archival data from recently completed studies examining substance abuse treatment outcomes, LGBT disparities in substance abuse treatment outcomes, and outcomes of vocational rehabilitation for HIV-positive persons.

California

| Investigator: | Adeline Nyamathi, Ph.D. |
|--------------------------|---|
| Institution: | University of California, Los Angeles |
| Project Title: | Homeless Female Offenders Returning to the Community: |
| | Improving Hopeful Futures |
| Research: | Clinical Research |
| Research Area: | Homeless Women, Parolees, Probationers, Substance Use |
| Earliest Start Date: | 6/20/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: Nursing majors are preferred, but will consider other majors in social sciences, e.g., Sociology and Psychology

Program Description: In this study, our team of UCLA and UCSF researchers plan to utilize our successful community participatory approach to engage Homeless Female Offenders (HFOs) who are participants of Residential Drug Treatment (RDT) programs, to assess the impact of a gender-sensitive criminogenic needs - focused intervention program, Female Ex-Offender Mentoring in Care (FEM-CARE), designed to reduce and or prevent relapse to drug use, recidivism, and eliminate or prolong number of days to re-incarceration. This study is based upon our team's history of more than two decades of research promoting theoretically-based, culturally-sensitive nurse-led interventions that are enriched with criminal justice theoretical guidance with homeless population which have led to significant reductions in recidivism, drug and alcohol use among homeless women and men, many of whom have had a history of incarceration.

<u>California</u>

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Student Qualifications: We are seeking undergraduate students with declared majors in psychology, sociology, or cognitive science. Candidates who have completed an introductory statistics course are preferred. Students will participate in a summer research training program with other summer interns from across a wide variety of disciplines at UCSF. Summer interns will be expected to attend summer research seminars and participate in laboratory meetings.

Program Description: This study will design and evaluate the feasibility and acceptability of a mobile optimized website for the dissemination of HCV and HIV health information. In the first phase of this work, we will explore potential barriers and facilitators related to the use of digital technologies among patients recruited from methadone maintenance treatment (N = 200). All participants will complete a computer-assisted interview that will assess sociodemographic and substance use characteristics, access to and use of digital technologies, trust in online information, health status, knowledge of HCV, and HIV/HCV risk behaviors. Qualitative interviews with a subsample of those who completed surveys will provide more indepth information about participants' trust in online health information, confidence in dealing with health issues and online health information, and preferences related to the use of digital technology to obtain health information, including information about HCV and HIV. In the second phase, we will design and test the feasibility and acceptability of a mobile optimized website: 1) website development and refinement (N = 5); and 2) randomized pilot study (N =40) to assess whether tailored motivational text messages will increase participants' motivation to use the website. If feasible and acceptable, the website will provide reliable, efficient, and high-quality HCV health information targeting drug users with the potential for wide dissemination.

<u>California</u>

| Investigator: | Chitra Mandyam, Ph.D. |
|--------------------------|--|
| Institution: | The Scripps Research Institute |
| Project Title: | Methamphetamine and Adult Hippocampal Neurogenesis |
| Research: | Basic research |
| Research Area: | Neural Stem Cells, Learning And Memory, Addiction, |
| | Behavior, Reward |
| Earliest Start Date: | 6/15/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

Student Qualifications: Students majoring in Biochemistry or Neuroscience preferred. Students should have an interest in performing animal behavior such as methamphetamine selfadministration, biochemical experiments including immunohistochemistry and should be interested in performing extensive microscopic analysis. Students with experience in animal handling, pipetting, tissue handling are desired.

Program Description: Neural stem cells persist in the adult hippocampal subgranular zone and mature into hippocampal granule cell neurons (a process known as hippocampal neurogenesis). Neurogenesis may play a significant role in brain repair and recovery from a number of insults. Withdrawal and relapse are integral parts of the addiction cycle, and withdrawal from methamphetamine self-administration (Meth SA) enhances reinstatement to Meth seeking. It is therefore essential to determine whether withdrawal from Meth SA alters the process of hippocampal neurogenesis via altering the structural plasticity of newly born granule cell neurons in the hippocampus. The student intern will assist the graduate student to determine whether withdrawal from Meth SA alters the dendritic arborization and spine density of newly born neurons in the granule cell layer of the hippocampus. We will use techniques such as retroviral labeling to label newly born granule cell neurons and perform 3D structural analysis on these neurons. We will use state-of-the-art software Neurolucida and NeuroExplorer from MicroBrightField to determine these issues. The overall goal of the summer internship will be to assess if withdrawal from Meth SA differentially alters the structural plasticity of newly born versus preexisting neurons in the granule cell layer in the dentate gyrus of the hippocampus. Preclinical rodent models of intravenous Meth SA will be used

California

| Investigator: | Daniele Piomelli, Ph.D. |
|--------------------------|---|
| Institution: | University of California, Irvine |
| Project Title: | Characterization of Anadamide Transport in Brain |
| Research: | Basic research |
| Research Area: | Endocannabinoid, Addiction, Ventral Tegmental Area, |
| | Nucleus Accumbens, Electrophysiology, Liquid |
| | Chromatography-Mass Spectroscopy |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Familiar with basic knowledge of laboratory environment, completed lower division biology and/or chemistry courses (lectures & labs), ability to work with laboratory animals such as rats and mice, collect animal tissues and work with hazardous chemicals such as methanol and chloroform. Prior research experience is preferred but not required of undergraduate students.

Program Description: The mesocorticolimbic system is comprised of the ventral tegmental area, nucleus accumbens, and medial prefrontal cortex. This brain system is responsible for processing reward and adaptive memory by attaching salience to environmental stimuli. Reward is processed by dopamine signaling arising from the ventral tegmental area. Alterations to normal dopamine signaling represent one key mechanism underlying the transition from drug use to addiction. Endocannabinoids are modulatory signals that are involved in modulation of dopamine signaling within the mesocorticolimbic system and may represent a potential therapeutic target. While existing evidence demonstrates the potential for endocannabinoids to modulate dopamine signaling at various sites within the system, there is little evidence for the direct production of endocannabinoids such as anandamide by neurons within the ventral tegmental area, nucleus accumbens, and prefrontal cortex. We hypothesize that anandamide is produced by neurons within the reward circuit which modulates dopamine signaling. Further, drugs of abuse will alter normal anandamide production at multiple sites in a synapse-specific manner, leading to an overall increase in dopamine signaling that may underlie addiction. To test these hypotheses, we will use a combination of whole-cell electrophysiology and liquid chromatography-mass spectroscopy to measure production of anandamide and other endocannabinoid signals in response to drugs of abuse in single neurons at multiple synapses within the mesocorticolimbic system. This research will elucidate the sites of endocannabinoid production within the reward system of the brain and demonstrate the importance of endocannabinoid production in normal reward processing. The results of this project will also reveal potential therapeutic targets at specific synapses within the reward circuit, allowing development of novel therapies to treat addiction. The summer intern will be involved in recording electrophysiological responses to drugs of abuse in single neurons via whole-cell electrophysiology, collection of single neurons for liquid chromatography-mass spectroscopy analysis, and data analysis.

<u>California</u>

| Investigator: | Joseph Guydish, Ph.D., M.P.H. |
|--------------------------|--|
| Institution: | University of California, San Francisco |
| Project Title: | Marketing, FDA Communications, Tobacco Perceptions |
| | and Use in Addiction Treatments |
| Research: | Clinical Research |
| Research Area: | Tobacco, FDA Regulations, Communications, Marketing, |
| | Substance Use Disorders |
| Earliest Start Date: | 5/13/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: We are seeking undergraduate students with declared majors in psychology, sociology, or cognitive science. Preferred student research interests include substance use, nicotine dependence, and organizational behavior. Candidates who have completed an introductory statistics course are preferred. Summer interns will be expected to attend summer research seminars and participate in laboratory meetings. Students from underrepresented populations are highly encouraged to apply.

Program Description: Dr. Joseph Guydish, Professor at the University of California, San Francisco (UCSF) leads the San Francisco Treatment Research Center at UCSF. The research of his team concerns access, delivery, and organization of substance abuse treatment services, including tobacco dependence treatment services. Dr. Guydish and his team offer research opportunities for undergraduate students in the behavioral and social sciences to facilitate their successful transition to graduate research. Summer students will participate in a 10-week program and gain exposure to the application of substance abuse research methods in real world treatment settings. Research projects include a study designed to examine the use of tobacco products, marketing, messaging, and perceptions associated with those products, and their relation to tobacco use behavior in addiction treatment populations and the use of graphic warning labels on cigarette packaging. NIDA summer interns participate in UCSF Summer Research Training Program (SRTP), which consists of social and academic events with other summer interns at UCSF. Students will participate in a substance abuse seminar, a weekly journal club where they present a journal article relevant to their summer research project and lead a group discussion about the material. Summer interns develop & conduct a research project using existing data, and present the results at the final SRTP projects as both a poster and oral presentation.

California

| Investigator: | Maria Cecilia G. Marcondes, Ph.D. |
|--------------------------|---|
| Institution: | The Scripps Research Institute |
| | La Jolla, CA |
| Project Title: | Methamphetamine and HIV Interactions in |
| | the Regulation of Glial Activation |
| Research: | Basic Research |
| Research Area: | Neuro-immunology of HIV and drug abuse |
| Earliest Start Date: | 1/15/2015 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Project Descriptions: We are employing a state-of-the-art ChIP-Next Gen sequence approach to identify, in human microglia and macrophage cell lines, promoters that are immediately affected by Methamphetamine and HIV Tat, which can affect inflammatory outcome and the status of the Central Nervous System as a viral reservoir. We are right now performing analysis, and the student will learn how to use bio-informatics and systems biology tools to identify target clusters and pathways, followed by validation techniques directed to a prioritized pathway of choice, with a focus on inflammation and regulation of the brain immune environment. This project is complementary to our current R01, which is focused mainly on the mechanisms related to the CCR5 promoter, in order to expand our analysis to other inflammation-relevant molecules with a translational value in the interface between HIV and drug abuse.

<u>California</u>

| Investigator: | Oliver George, Ph.D. |
|----------------------|---|
| Institution: | The Scripps Research Institute |
| | La Jolla, CA |
| Project Title: | Effect of Exposure to Nicotine Vapor on the Vulnerability |
| | to Nicotine Dependence |
| Research: | Basic Research |
| Research Area: | Nicotine, Addiction, Dependence, Stress, Reward |
| Earliest Start Date: | 5/15/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Limit: | 18 |

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 hypothesis under test is that low to moderate levels of nicotine vapor will facilitate the acquisition of nicotine self-administration, exacerbate the effect of nicotine withdrawal, and increase the risk for relapse. Our preliminary data demonstrate that moderate to high levels of nicotine vapor exposure that lead to blood nicotine levels that are similar to electronic cigarette use increase withdrawal symptoms and facilitate the acquisition of nicotine self-administration. Our results also show that withdrawal from nicotine in dependent rats increases anxiety-like behavior and pain sensitivity. The following Specific Aims will directly test the effects of a wide range of nicotine vapor levels on these behaviors and neuroadaptations that appear to be critical for the development of and relapse to nicotine dependence.

Specific Aim 1: Test the effect of chronic exposure to nicotine vapor on anxiety-like behavior and pain. We will measure the effect of different levels of nicotine vapor exposure, ranging from second-hand to heavy electronic cigarette smoking, on anxiety-like behavior and pain sensitivity using a novel model of nicotine vapor inhalation.

Specific Aim 2: Test the effect of chronic and acute exposure to nicotine vapor on the acquisition and reinstatement of nicotine self-administration. We will measure the effect of different levels of nicotine vapor exposure, ranging from second-hand to heavy electronic cigarette smoking, on the acquisition of nicotine self-administration and relapse to nicotine seeking in rats using state-of-the-art models of escalation of nicotine self-administration in rats.

The results of these studies will (i) elucidate the behavioral effects of nicotine vapor exposure, similar to a wide range of electronic cigarette exposure, (ii) determine the minimum level of nicotine vapor exposure required to produce an increased risk for the acquisition of and relapse to nicotine dependence, and (iii) important information for nicotine dependence prevention efforts and policymakers.

<u>California</u>

| Investigator: | Stephen V. Mahler, Ph.D. |
|--------------------------|--|
| Institution: | University of California, Irvine |
| Project Title: | Role of Ventral Pallidum Projection to VTA in |
| | Reinstatement of Cocaine Seeking |
| Research: | Basic research |
| Research Area: | Behavioral Neuroscience, Addiction, Cocaine, Reward, |
| | Drugs, Motivation, Dreadds, Optogenetics, Channel |
| | Rhodopsin, Relapse, Reinstatement, Cues, and Conditioned |
| | Stimuli |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Prior research experience is preferable, especially with rat behavioral experiments, electrophysiology, immunohistochemistry, microscopy, and/or computer programming.

Program Description: Addiction is a major health concern, and its chronic relapsing nature is perhaps its most insidious aspect. Exposure to drug-associated cues is a risk factor for relapse, and understanding how the brain processes these cues may lead to addiction therapies. Here, we examine the role of projections from the ventral palladium (VP) to ventral tegmental area (VTA) in a rat self-administration/cue-induced reinstatement model of relapse. We will employ novel designer receptors (DREADDs) that allow on-demand inhibition or activation of VP and VTA cells during behavior. I have found that projections from VP to VTA are activated during cued reinstatement, and that DREADD inactivation of these projections specifically blocks this behavior. Here, we explore the mechanisms by which VP-VTA projections mediate cued reinstatement, and how VP inputs modulate VTA activity. Using a combination of immunohistochemistry (postmortem staining for neural activity and cell types), electrophysiology (recording the firing of neurons in an anesthetized rat), and virusbased strategies to control neuron activity during reward seeking behavior (optogenetics and DREADDs), we will determine the roles of VP projections to VTA in drug relapse. These experiments will therefore characterize the mechanisms of the novel, functionally-identified VP-VTA pathway, which is crucially involved in cue-induced reinstatement of cocaine seeking in a rat model of relapse in addiction.

<u>California</u>

| Investigator: | Steven Shoptaw, Ph.D. |
|--------------------------|--|
| Institution: | University of California, Las Angles |
| Project Title: | Combating Craving with Contingency Management: |
| | Neuroplasticity and MA Abuse in South Africa |
| Research: | Clinical Research |
| Research Area: | Clinical Trials, Medication Development, Translational |
| | Research, Methamphetamine Research, Substance Use and |
| | HIV |
| Earliest Start Date: | 6/20/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: Candidates should have completed at least two years of college. Basic knowledge of Excel and PowerPoint is required. Some familiarity with statistics is helpful. Our work will interest those pursuing a career in a clinical field such as psychology or medicine. Students should be comfortable working with people of diverse backgrounds and discussing sensitive behavioral issues, including drug use and high-risk behaviors. Must be able to maintain strict confidentiality of patient information.

Program Description: The UCLA Center for Behavioral & Addiction Medicine (CBAM) provides NIDA Interns with exposure to ongoing programs of addiction research including clinical trials of novel medications to treat drug dependence. Our work also includes HIV prevention research with high risk populations, especially those who use drugs. Interns work closely with faculty and staff over the course of the summer to develop a deeper understanding of addiction and the various evidence-based treatment approaches available. Interns are given the opportunity to see how addiction treatment is conducted in a primary care setting versus an outpatient research clinic setting and how researchers in Los Angeles work closely with community. Because the majority of our work is clinical, students generally will not work directly with study participants, but will meet one-on-one with staff and faculty involved in daily clinical research operations. Interns attend lectures and presentations and may work with research data. Interns attend regular Center meetings in order to learn the organizational structure of research and how to resolve questions and problems in carrying out study protocols.

California

| Investigator: | Su Guo, Ph.D. |
|--------------------------|---|
| Institution: | University of California, San Francisco |
| Project Title: | Developing tools to understand the neuromodulation of hypothalamic function |
| Research: | Clinical Research |
| Research Area: | Neural Circuitry, Stress, Dopamine, CRF, Tool Development, Drug Abuse, Zebrafish |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

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

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

California

| Theodore Friedman, M.D., Ph.D. |
|--|
| Charles R. Drew University of Medicine & Science |
| Drew MIDARP (Infrastructure in Drug Abuse Research) |
| Basic Research |
| Smoking, Nicotine, Insulin Resistance, Obesity, Diabetes, Drug Addiction, Fatty Liver Disease |
| 6/1/2016 |
| No |
| Undergraduate |
| None Listed |
| |

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 (Diversitypromoting 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. Additional opportunities exist for PET scanning projects, 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 and learn about drug addiction research.

Connecticut

| Investigator: | Frederick Altice, M.D., M.A. |
|--------------------------|--|
| Institution: | Yale University |
| Project Title: | Expanding Medication-Assisted Therapies in Ukraine |
| Research: | Epidemiology Research |
| Research Area: | Opioid substitution therapy, implementation science, HIV prevention, HIV treatment, methadone, buprenorphine, extended-release naltrexone, attitudes, health beliefs, operations research, qualitative research, respondent driven sampling, people who inject drugs |
| Earliest Start Date: | 5/15/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Program Description: Ukraine's HIV epidemic, fueled primarily among opioid-dependent people who inject drugs (PWIDs), remains volatile despite gains achieved elsewhere. PWIDs account for ~70% of cumulative and >56% of new HIV infections. Despite Ukraine's HIV epidemic transition toward a generalized epidemic, empiric and mathematical modeling suggest that medication-assisted therapy (MAT) is the most effective and cost-effective approach to reverse this trend. MAT is associated with reduced HIV transmission and improved HIV treatment outcomes including engagement in care and antiretroviral medication access and adherence. Though MAT is free and capacity has increased since 2004, <3% of PWIDs receive it. MAT scale-up is complex, poorly understood and has been fraught with low entry and high attrition. Corrective interventions that facilitate MAT entry and retention are therefore crucial for HIV prevention and treatment efforts in Ukraine. Using implementation science techniques, we examine both HIV (linkage to and retention in HIV care, initiation of and adherence with antiretroviral therapy) and substance abuse (time to opioid relapse, percent of day's opioid free, retention on MAT) treatment outcomes among a cohort of HIV+ PWIDs. In this project we are using qualitative and quantitative methods to improve MAT scale-up and build regional capacity. The 2016 Summer Intern would work with investigators in the US and in Ukraine to examine client- and program-level facilitators and barriers to MAT.

Connecticut

| Kimberly Yonkers, M.D. |
|--|
| Yale University |
| Three Strategies for Implementing Motivational |
| Interviewing on Medical Inpatient Units |
| Clinical Research |
| Implementation, Motivational Interviewing, Substance |
| Abuse |
| 5/18/2016 |
| No |
| High School/Undergraduate |
| 16 |
| |

Student Qualifications: This project requires no prior research experience. The student would work side by side with research staff as they screen possible patient participants for a substance use disorder. The student should speak English, be available for 8 weeks during the summer and be willing to work in a non-judgmental manner with individuals who have substance use problems.

Program Description: The intern will assist with day-to-day operations at the study field site gaining experience with cleaning study data, transporting biological specimens, conducting study assessment visits, and joining meeting with our community partner (a substance abuse treatment program serving men who have sex with men). In collaboration with the study PI and postdocs, the intern will also complete a small, independently conceived research project using archival data from recently completed studies examining substance abuse treatment outcomes, LGBT disparities in substance abuse treatment outcomes, and outcomes of vocational rehabilitation for HIV-positive persons.

Connecticut

| Investigator: | |
|--------------------------|--|
| Institution: | |
| Project Title: | |
| | |
| Research: | |
| Research Area: | |
| Earliest Start Date: | |
| Housing Available: | |
| Student Level: | |
| Minimum Age Requirement: | |

Linda Mayes, M.D. Yale University Oxytocin and Brain Reward and Stress Responses to Infant Cues in Addicted Mothers Clinical Research Parenting, addiction, oxytocin, fMRI 6/1/2016 No Undergraduate None Listed

Student Qualifications: None

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

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 |
| | Processes |
| Research: | Basic Research |
| Research Area: | Developmental Neuroscience and Neural Circuit |
| | Function |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | 16 |

Student Qualifications: Potential career research interest and/or major in 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 Description: 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,pProjects in the lab are focused on a variety of questions regarding limbic system development, function and dysfunction, and include, 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.

<u>Florida</u>

| Investigator: | Laura Bohn, Ph.D. |
|--------------------------|--|
| Institution: | The Scripps Research Institute |
| | Jupiter, FL |
| Project Title: | Synthesis and Evaluation of Functionally Biased Opioid |
| | Analgesics |
| Research: | Drug Development Research |
| Research Area: | Opioid Receptors, Morphine, Reward, |
| | Reinforcement, GPCR Pharmacology, Ligand Bias, |
| | Drug Discovery, Mouse Models, Biochemistry, Cell |
| | Biology, Animal Behavior |
| Earliest Start Date: | 5/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 16 |

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

Project Description: We have developed mu opioid receptor agonists that bias MOR signaling toward G protein pathways over beta-arrestin recruitment. Based on extensive work using Barrestin2-KO mice, we have hypothesized that activation of MOR without Barrestin2 recruitment will provide antinociception without side effects, including tolerance, constipation, respiratory suppression and physical dependence. We do not know whether the compounds will be more or less rewarding. These studies are beginning using mouse conditioned place preference (CPP) assays. The student would have the opportunity to take part in an active drug discovery program. We are a small efficient group of researchers (8 on the team) and the student would have the opportunity to experience firsthand how we evaluate our compounds in vitro and in vivo; they would learn how we use our findings to drive lead molecule identification and direct further chemical development.

<u>Florida</u>

| Investigator: | Linda B. Cottler, Ph.D., M.P.H. |
|--------------------------|--|
| Institution: | University of Florida |
| Project Title: | ABCD-USA Consortium: Research Project |
| Research: | Epidemiology Research |
| Research Area: | community-based research, adolescent substance use, assessment development |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Program Description: The Department of Epidemiology at the University of Florida has opportunities available for Summer Scholars interested in a challenging, yet rewarding, summer experience. The 2014 Summer Scholars will work on an ongoing NIDA research study entitled "Transformative Approach to Reduce Research Disparities towards Drug Users." Summer Scholars will be involved in the third phase of this research, which involves the extension of the CTSA street-based outreach model to target people with recent illicit drug use and link them to our community-based outreach site, HealthStreet, where they can be connected with University of Florida research trials. 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. More specifically, Summer Scholars will learn about the outreach protocols utilized at HealthStreet by shadowing the Community Health Workers; screen potential study participants, through HealthStreet, and link them to open studies; test our newly developed web-based HealthStreet database; and develop educational materials for various audiences designed to dispel the myths associated with enrolling individuals with a history of illicit drug use in research studies. These activities, as defined, will serve as an introduction to drug abuse research.

<u>Georgia</u>

| Michael Eriksen, Sc.D. |
|--|
| Georgia State University |
| The Science of Decision Making: Connecting People to |
| Policy |
| Basic Research |
| Tobacco use, novel tobacco products, risk perceptions, |
| decision making, point of sell, economic impact |
| assessment, consumer behavior |
| 6/1/2016 |
| Yes |
| Undergraduate |
| None Listed |
| |

Student Qualifications: Outstanding undergraduate student in field relevant to regulatory science including pre-law, social sciences, economics, psychology, public health, and communications. Excellent written and oral communication skills and the ability to work individually as well as in teams are needed. The student should have an interest in research, public health and tobacco control. Intern will not conduct research with animals, humans or tissue samples. No prior research or experience in the field is required.

Program Description: Summer students at the GSU TCORS will have the opportunity to assist research staff working on the project titled, "Conducting Consumer Behavior, Risk Perception and Media Research on Novel Tobacco on Products." This project includes both quantitative and qualitative research examining adults' risk perceptions about novel and alternative tobacco products, including electronic cigarettes and little cigars/cigarillos. The findings from this research will be used to develop a prototype of a media campaign designed to accurately inform consumers about the risks associated with use of these products.

The student will have the opportunity to assist with the following tasks to support the project:

- Analysis of quantitative data from the online survey
- Analysis of qualitative data from focus groups and key informant interviews
- Evaluation of a media campaign prototype
- Writing reports based on findings from the research
- Conducting literature reviews to support the research

Because there are several ongoing projects with the TCORS, the intern will have the opportunity to develop their skills in several areas through their mentored involvement in the research.

<u>Hawaii</u>

| Investigator: | Scott K. Okamoto, Ph.D. |
|--------------------------|---|
| Institution: | Hawaii Pacific University, |
| | Honolulu, HI |
| Project Title: | The Development and Evaluation of the Ho'ouna Pono |
| | Drug Prevention Curriculum |
| Research: | Social/Behavioral Research |
| Research Area: | Health disparities, rural, Hawaiian youth, and prevention |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: This project requires students to work with humans only. It is appropriate for undergraduate students majoring in psychology, social work, public health, or another allied discipline. Students with knowledge and/or interest in rural, Native Hawaiian, and/or Pacific Islander youth populations are preferred. Students with skills in video editing using computer-based programs (e.g. Final Cut) are encouraged to apply.

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

<u>Illinois</u>

| Investigator: | Brian Mustanski, Ph.D. |
|--------------------------|---|
| Institution: | Northwestern University |
| | Chicago, IL |
| Project Title: | Multilevel Influences on HIV and Substance Use in a |
| | MSM Cohort |
| Research: | Clinical Research |
| Research Area: | HIV; Young Men Who Have Sex With Men; Multilevel |
| | Influence, Drug, Sex, And Social Networks; Dyadic |
| | Influences; Substance Use; Stis; Mental Health; Viral |
| | Set Point; Plasma HIV Sequencing |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

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

Project Description: The mission of the IMPACT Program within the Department of Medical Social Sciences and Northwestern University is conduct community-based research which improves the health and well-being of LGBTQ adolescents. The overall goal of the current project -- RADAR -- 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). Project aims are as follows: 1) Understand how co-occurring problems (or "syndemics") of substance use, HIV, sexually transmitted infections, mental disorders, and violence develop among YMSM and their partners over time; 2) Determine how relationship characteristics (or dyadic processes) influence HIV risk behaviors and transmission among YMSM; 3) Describe networks and social influences on "syndemic" development among YMSM; 4) Determine if, and how, substance use increases risk of HIV infection and the amount of HIV, or viral load, in a person's blood. We will accomplish these aims by enrolling YMSM who have participated in other IMPACT research studies. As participants develop serious partners, we will enroll those individuals to build a larger cohort of approximately 1,350 participants over the course of this five-year study. The summer intern will assist with study-related research and manuscripts. For motivated interns who have advanced skills in writing and conducting statistical analysis, authorship and co-authorship is possible. The intern will also have opportunities to meet with and learn from community-based research staff.

<u>Illinois</u>

| Investigator: | John Schneider, M.D., M.P.H |
|--------------------------|--|
| Institution: | University of Chicago |
| Project Title: | Social Network Dynamics, HIV, and Risk Reduction |
| | among Younger Black MSM |
| Research: | Social and Behavioral Research |
| Research Area: | HIV, Social Network, YBMSM, MSM, Social Support, |
| | Risk, Youth |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |
| | |

Student Qualifications: The NIDA summer intern should be interested in sexual health, risk behaviors (including sexual risk and substance use), health disparities, and working in low resource settings. The intern should also be comfortable facilitating activities with young people and talking about sensitive subjects related to sex and sexuality. No research experience is required; however, the intern must have experience working with African American and sexual minority youth.

Program Description: The Youth Health Leadership Corps (YHLC) is a youth-led initiative on the South Side that will empower young people to become active participants in the design and implementation of HIV and sexual health services. The YHLC will also advise unmet, critical service needs related to substance and alcohol. A team of 10 youth leaders will be trained by skilled facilitators on sexual health, substance use and risk behavior, outreach strategies, research methodology, quality improvement needs assessments, and evidence-based program planning. Upon completion of the training sequence, youth will create a quality improvement needs assessment that addresses how YBMSM access social and sexual health services in the community. Participating youth will develop a cultural competency training series for providers treating YBMSM and refine existing adolescent HIV and sexual health programming.

The NIDA summer intern will assist our team of youth leaders in administering the quality improvement needs assessment with other youth and clinical providers. The summer intern will also be responsible for facilitating training modules related to substance and alcohol use risk behaviors. The intern will provide feedback to youth as they create a cultural competency curriculum for case managers and health providers. He or she will also assist youth in the planning and implementation of various health outreach events held for youth of the greater South Side community.
<u>Illinois</u>

| Investigator: | Mary E. Mackesy-Amiti, Ph.D. |
|--------------------------|--|
| Institution: | Fred Hutchinson Cancer Research Center |
| | Seattle WA |
| Project Title: | Emotion Dysregulation and Risky Behavior among |
| | People Who Inject Drugs |
| Research: | Epidemiology Research |
| Research Area: | Alcohol Use Disorder, Cocaine use, HIV transmission, |
| | Men who have sex with men, Peru |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |
| | |

Student Qualifications: Students with an interest in public health, psychology, or social science are preferred. Basic computer proficiency is required, and experience with Android mobile phone systems is desirable. Prior coursework in statistics is a plus. This research will involve working with people who inject drugs. Previous research experience is not required.

Project Description: The student will participate in a research project conducted by Community Outreach Intervention Projects (COIP), a part of the School of Public Health. People who inject drugs (PWID) are at risk for infection with HIV or hepatitis C when they share injection equipment with others who may be infected. Individuals who have difficulty regulating their emotional state may be more likely to engage in risky behavior such as sharing syringes. This study will investigate the relationship between mood and risky injection behavior among young people who inject drugs using ecological momentary assessment (EMA). EMA is a method of collecting data in real time, in the context of everyday life. Participants will be recruited from syringe exchange programs operated by Community Outreach Intervention Projects in two Chicago neighborhoods. Study participants will be asked to answer questions about their mood and behavior using a mobile phone app several times a day over a period of two weeks. They will complete a computerized questionnaire at the baseline visit, and a brief interview at the follow-up visit after two weeks. The results of this study may help us to design an intervention for PWID who have difficulty with emotion regulation.

Iowa

| Investigator: | Ryan LaLumiere, Ph.D. |
|--------------------------|--|
| Institution: | University of Iowa |
| | Iowa City, IA |
| Project Title: | Isolating the Extinction Circuit for Cocaine Seeking |
| Research: | Basic Research |
| Research Area: | Cocaine, Self-administration, Rats, Circuitry, Behavior, Prefrontal cortex |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Project Description: Our laboratory investigates the neural mechanisms underlying cocaineseeking behavior in rats. Therefore, the research project for the summer intern will involve conducting drug self-administration experiments in rats. The rats will then undergo extinction training, followed by reinstatement testing. The reinstatement serves as a model of relapse in drug-addicted individuals. During the reinstatement testing, activity in different brain regions can be altered to determine the role of those regions in regulating this behavior. In particular, the summer intern's project will focus on the role of the infralimbic cortex in cocaine seeking. Our prior work indicates that this region is involved in the extinction of cocaine-seeking behavior. Therefore, our continuing work has focused on the precise mechanisms in this structure that underlie extinction learning. The intern's project will examine how activation and blockade of different receptors within the infralimbic cortex influence the extinction of cocaine seeking. As part of this project, the intern will be involved in stereotaxic and catheter implantation surgeries, conducting the behavioral components of the task, and engaging in the necessary histology analysis following the experiment.

Kentucky

| Investigator: | Chang-Guo Zhan, Ph.D. |
|--------------------------|---|
| Institution: | University of Kentucky |
| | Lexington, KY |
| Project Title: | Deveopment of Long-Lasting Cocaine Hydrolase as a |
| | Treatment for Cocaine Abuse |
| Research: | Drug Development Research |
| Research Area: | Cocaine abuse, enzyme therapy, protein drug, and |
| | Biotechnology |
| Earliest Start Date: | 5/16/16 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: The candidates have learnt a course in biochemistry and a course in biology.

Project Description: Development of a truly effective anti-cocaine medication has been very challenging, particularly for treatment of cocaine abuse. Enhancing cocaine metabolism by administration of butyrylcholinesterase (BChE) has been recognized as a promising treatment strategy for cocaine abuse. However, the catalytic activity of this plasma enzyme is low against the naturally occurring (-)-cocaine. Our integrated computational-experimental effort has led to discovery of high-activity mutants of human BChE, known as cocaine hydrolases (CocHs), with at least 1,000-fold improved catalytic efficiency against (-)-cocaine compared to wild-type BChE. In vivo evidences indicate that our discovered CocHs are promising candidates for development of an anti-cocaine medication. In addition, it has been shown that many cocaine users use heroin along with cocaine. Interestingly, BChE can also hydrolyze heroin to 6monoacetylmorphine (6-MAM) and 6-MAM to morphine. It is also interesting to determine whether CocHs (BChE mutants) can hydrolyze heroin and 6-MAM and, thus, regulate physiological effects of heroin in rodents (mice and rats). The high school student will be instructed to participate in the studies that aim to understand how CocHs affect the metabolic profiles and physiological effects of cocaine and heroin in rodents, following the corresponding in vitro activity tests. These studies will also help to understand how heroin affects the potency of CocHs in detoxifying cocaine.

Maine

| Elissa J. Chesler, Ph.D. |
|--|
| The Jackson Laboratory |
| Discovery of Addiction-Related Genes with Advanced |
| Mouse Resources |
| Basic research |
| Behavioral Genetics, Diversity Outbred Mice, Drug-Self |
| Administration, Bioinformatics |
| 6/4/2016 |
| Yes |
| Undergraduate |
| None Listed |
| |

Student Qualifications: Experience in mouse behavioral testing or statistical programming and data analysis is desirable but not required.

Program Description: Model organism studies of addiction related behaviors allow us to identify the genes and mechanisms involved in many different stages and processes of addiction. Genetic analysis of behavior and the expression of genes associated with behavior will enable the identification of new pathways, processes and mechanisms of addiction. Integrative bioinformatics analyses allow us to combine data across species and experiments to refine and extend the findings from genetic mapping studies. Summer students will work on behavioral data acquisition and analysis or applied bioinformatics analysis of the addiction genomics literature. Trainees with advanced computational or statistical experience may work on methods development or advanced data analysis projects.

Massachusetts

| Investigator: | Camron Bryant, Ph.D. |
|--------------------------|---|
| Institution: | Boston University School of Medicine |
| Project Title: | Genetic Basis of Opioid Reward and Aversion in Mice |
| Research: | Basic Research |
| Research Area: | 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 |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Basic knowledge of molecular biology and/or some pipetting experience and/or experience in the statistical software environment are desired, but not required. Great pride in their work (no matter how large nor how small the task) and attention to detail are the key ingredients I am looking for. A career interest in psychiatric disorders would be beneficial for everyone.

Program Description: Opioid addiction is an epidemic in the United States. Drug abuse is known to have a genetic component and epidemiological studies indicate that individuals reporting a pleasurable experience are most likely to transition to drug abuse. We are mapping the genetic basis of opioid reward and aversion in a conditioned place preference/aversion paradigm. We identified robust strain differences in C57BL/6 strains and we are now close to identifying novel candidate variants that we will directly ascertain via gene editing in vivo. 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 immunnoblotting for measuring protein levels. Pending prompt animal training and protocol approval, the student could also potentially be involved in running behavioral studies in mice. We are also mapping the genetic basis of binge eating and behaviors associated with food "addiction". There are also opportunities for computational training in RNA-seq analysis of the transcriptome in TALENs and CRISPR gene-edited mice that show differences in addiction relevant traits. Please see our website under "Research" for additional details about our lab.

Massachusetts

| Investigator: | Jane Liebschutz, M.D., M.P.H. |
|--------------------------|---|
| Institution: | Boston Medical Center |
| Project Title: | Transforming Opioid Prescribing in Primary Care |
| Research: | Clinical Research |
| Research Area: | Addiction, Opioids, Primary Care |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: This internship opportunity is for motivated, detail-oriented students with an interest in medicine or health disparities. Students with previous experience in research are preferred however we will provide extensive training and welcome all to apply. Students with strong work ethic, interest in medical research, commitment to diversity, and sense of humor are required. Graduating or rising seniors preferred, but all undergraduate levels will be considered.

Program Description: Summer interns will work in the Department of Medicine at Boston Medical Center as part of the TOPCARE study. TOPCARE aims to implement and evaluate a new model of care to decrease the misuse of and addiction to opioids among patients with chronic pain in primary care settings. The student may also assist with activities related to the Skin and Needle Hygiene Intervention (SKIN) project, a randomized controlled trial testing a psycho-educational intervention to decrease bacterial infections among injection drug users. Interns' day-to-day duties will offer opportunities for clinical exposure in primary care settings focused on underserved urban populations. Interns may be involved in recruitment, data collection, retention activities, and various other study-related tasks. Individual projects will be assigned to interns based on availability and interest. Interns will also be encouraged and provided with the opportunity for mentorship by study investigators.

Interns will have the opportunity to take part in our department's summer intern curriculum with medical students and other undergraduate and graduate students conducting summer projects. The inters will have weekly opportunities to shadow physicians and other expert care providers in various addiction treatment/services settings and participate in an addiction research seminar series with general internists active in addiction research, who will discuss their area of interest, their research methods, and career paths.

Massachusetts

| Jeffrey Samet, M.D., M.P.H |
|---|
| Boston University |
| Improving Physician Opioid Prescribing for Chronic Pain |
| in HIV-Infected Persons |
| Clinical Research |
| HIV; Addiction; Prescription Opioid Misuse; Pain; |
| Opioids; Clinical Research; Intervention; RCT; |
| 6/1/2016 |
| No |
| Undergraduate |
| None Listed |
| |

Student Qualifications: The student may work with HIV-infected or substance using patients. Cultural sensitivity and comfort with a wide range of populations is preferred. The student should be highly organized, detail-oriented and have exceptional communication skills. Preferred majors/career interests include biology, psychology and pre-med, although students from other disciplines are welcome if highly interested in HIV and addiction. Previous research experience is a plus, but not required.

Program Description: The "Targeting Effective Analgesia in Clinics for HIV" (TEACH) Study will 1) test the effectiveness of a collaborative care intervention directed toward HIV physicians to improve the management of chronic opioid therapy (COT) and 2) create and follow an observational cohort of HIV-infected patients on COT. Study follow-up for both aspects of the TEACH study, the collaborative care intervention and the observational cohort, will take place in summer 2016.

Among HIV-infected persons burden of chronic pain is disproportionately high, with prevalence studies suggesting 20-90% affected, even in the era of highly active antiretroviral therapies. One common pain management strategy is the use of chronic opioid therapy (COT). Studies suggest that one-fifth of all HIV-infected patients are prescribed opioids for pain. Prescription opioids are currently the most commonly abused drugs in the United States, and prescription drug overdose rates are rising in parallel with rates of opioid prescribing. A few recent studies have suggested that prescription opioid misuse/abuse may be a relatively common problem among HIV-infected patients in the United States, perhaps because of the common overlap between HIV and substance use. However, little is known about attitudes toward chronic opioid therapy among HIV-infected patients, and how receipt of chronic opioids impacts trust in providers and satisfaction with care.

Massachusetts

| Margarita Alegria, Ph.D. |
|---|
| Massachusetts General Hospital |
| International Latino Research Partnership |
| Clinical Research |
| behavioral health; mental health; substance use; HIV risk |
| and prevention; racial/ethnic disparities. |
| 6/1/2016 |
| No |
| Undergraduate |
| None Listed |
| |

Student Qualifications: Excellent organizational and interpersonal skills required. BA required, preferably in the social sciences. Strong writing and typing skills are necessary. Bilingual Spanish skills are also required.

Program Description: The RA will work on a NIDA-funded study that observes substance use and HIV risk in multicultural populations. Research tasks include conducting literature searches and preparing bibliographies for scholarly papers, creating tables and graphs, entering data, etc. Responsibilities also include some administrative tasks such as general office and meeting support.

<u>Michigan</u>

| Investigator: Institution: | Marc A. Zimmerman, Ph.D. University of Michigan Ann Arbor, MI |
|--|--|
| Project Title: | Intergenerational transmission of drug use in an urban sample |
| Research: | Epidemiology Research |
| Research Area: | Alcohol, tobacco, and other drug use (ATOD) Parenting style, attitudes, and behaviors Transmission of ATOD use, coping and prosocial behaviors Intervention development, Multilevel and longitudinal data |
| Earliest Start Date: | 5/25/2016 |
| Housing Available: Student Level: Minimum Age Requirement: | Yes Undergraduate None Listed |

Student Qualifications: Interns should have an interest in community-based research, childhood/adolescence, parenting behavior, or substance use behaviors. Interns will not have contact with human subjects, but will complete required human subjects/ethics training prior to joining the study. Interns should have strong writing skills and feel comfortable working/learning with others. Data analytic interest/skills are a plus, but not required. Previous research is not required.

Project Description: The study seeks to understand the intergenerational transmission of risk for alcohol, tobacco, and other drug use (ATOD) in a predominantly African-American sample, the first generation of which we have been following since 1994. Generation 1 (G1) in the proposed study includes parents of over 300 children aged 5-16 years old. The sample is unique in that the few studies on intergenerational transmission do not include a large sample of urban African-Americans with middle to low income backgrounds. The applicant will apply a socioecological developmental framework to study how familial and neighborhood environments, as well as the individual behaviors, attitudes, and experiences of a cohort of parents in middle adulthood (G1), influence parenting style, attitudes, and behaviors over time, and how these factors may influence the attitudes and behaviors of their children (G2).

The intern will assist with research implementation, data collection, analysis and, depending on experience, write-up. More specifically, the intern will be exposed to the data collection process and materials, and will assist in preparing surveys/interview protocols for the second round of data collection in fall 2015. Interns will have the opportunity to conduct guided data analyses on the first wave of data collection and will assist in data preparation and management. Interns will also contribute to preliminary reports of the findings (e.g., media announcements; results summaries) and may participate in manuscript preparation for conference or academic outlets.

Michigan

| Investigator: | Shelly Flagel, Ph.D. |
|--------------------------|---|
| Institution: | University of Michigan |
| Project Title: | Integrated GWAS of complex behavioral and gene |
| | expression traits in outbred rats |
| Research: | Basic Research |
| Research Area: | Neuropsychopharmacology, behavioral neuroscience, and |
| | behavioral genetics |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: It is desired that interns placed in our lab have previous behavioral neuroscience research experience, although not required. Interns will be conducting a number of behavioral tests with rats, assisting with surgeries, and will also be exposed to basic neuromolecular techniques. We would like students who are enthusiastic about our research topic, motivated and responsible. Ideally, we would like students who are interested in attending graduate school and in pursuing a career in academia.

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

<u>Michigan</u>

| Investigator: | Tom Kerppola, Ph.D. |
|--------------------------|---|
| Institution: | University of Michigan |
| | Ann Arbor, MI |
| Project Title: | Visualization of Combinatorial Epigenetic Marks and |
| | Complexes in Animals |
| Research: | Basic Research |
| Research Area: | Embryonic stem cells, fluorescence imaging |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | 14 |

Student Qualifications: The summer student is expected to engage in their project full time during the entire period of the NIDA program. Students who have held summer internships in our laboratory in the past two years are now pursuing graduate studies at Harvard University and University of North Carolina.

Project Description: The Kerppola laboratory engages in many fields of research. Examples of research areas that a summer student can participate in include:

1. Interactions among transcription regulatory proteins mediate the combinatorial regulation of gene expression. We have developed a bimolecular fluorescence complementation (BiFC) assays for visualization of protein interactions and modifications in living cells and animals. These approaches provide the opportunity to investigate the cell-type and tissue-specificity of protein interactions and modifications in their normal cellular environments.

2. Epigenetic regulatory protein complexes maintain and control transitions between different cellular states. We have developed methods for visualization and characterization of epigenetic regulatory complex binding to chromatin in living cells. These methods provide the opportunity to investigate the mechanisms that establish and interpret the epigenetic state critical for stem cell maintenance.

3. Many cancers have complex genetic and epigenetic causes. We are pursuing new strategies for the development of therapies for rare cancers whole molecular causes have not been identified. These strategies are based on the investigation of candidate drugs that have favorable pharmacological and toxicological characteristics in animals. These strategies provide the opportunity to develop new therapies for patients who have no effective treatment options currently.

<u>Missouri</u>

| Investigator: | Laura Bierut, Ph.D. |
|--------------------------|--|
| Institution: | Washington University |
| Project Title: | Nicotine Dependence to Smoking Cessation: Sequencing |
| - | Common and Rare Variants |
| Research: | Clinical research |
| Research Area: | Return of genetic results in a smoking population |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Research will require interaction with human research participants. Students should be comfortable interacting with patients and research participants from diverse backgrounds. Previous research experience is not required.

Program Description: Twin studies have long recognized that genetic factors contribute to smoking tobacco. Our group led the first study to report a genetic association between nicotine dependence and the region surrounding the CHRNA5-CHRNA3-CHRNB4 cholinergic nicotine receptor subunit genes. Subsequently, this region has been strongly replicated in large meta-analyses and has emerged as the strongest genetic risk factor for smoking related behaviors. Studies from our group and others have also demonstrated that variation in the CHRNA6-CHRNB3 receptor subunits and nicotine metabolizing gene CYP2A6 are also associated with heavy smoking and nicotine dependence. The goal of the parent study of this summer project is to further characterize genetic findings for nicotine dependence and then to integrate how these associations contribute to smoking cessation.

Students will interview research participants who are current smokers using a standardized questionnaire that assesses personal history and history of substance use. Students will also collect saliva samples from participants for genotyping purposes. By collecting a large diverse sample of genotyped smokers, the goal of this project is to further dissect how genetic variants contribute to smoking related behaviors.

<u>Missouri</u>

| Investigator: | Li-Shiun Chen, M.D., M.P.H., Sc.D. |
|--------------------------|--|
| Institution: | Washington University |
| Project Title: | Genetically Informed Smoking Cessation Trial |
| Research: | Clinical Research |
| Research Area: | pharmacotherapy, smoking cessation, and genetics |
| Earliest Start Date: | 5/30/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Previous research experience is not required. Research will require work with humans. Applicants must have the ability to follow oral and written instructions.

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

<u>Missouri</u>

| Investigator: | Patricia Cavazos, Ph.D. |
|--------------------------|---|
| Institution: | Washington University School of Medicine |
| Project Title: | Implications of Social Media Content and Engagement for |
| | Alcohol and Marijuana use |
| Research: | Epidemiology Research |
| Research Area: | psychiatry, social media, and substance use |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Interest in adolescent substance behavior; Hold/plans for degree in health-related field; Ability to follow oral and written instructions; Verbal and written communication skills in English; Ability to attend to detail; Knowledge of social media platforms; Experience conducting qualitative data analysis; Experience developing and administering surveys; Ability to assist in writing scientific manuscripts; No work with animals/humans/tissue samples. Previous research experience not required.

Program Description: This research focuses on examining new and emerging trends in substance use behaviors, specifically among adolescents. The NIDA intern(s) would be involved in cutting-edge research that examines substance use-related content across various social media platforms. She/he will work with the research team to evaluate the chatter that encourages and discourages marijuana/alcohol use. Through this process, she/he will assist in assessing engagement, temporal trends and sentiment of these tweets. Additionally, the intern will have the opportunity to assist with the analysis and interpretation of a unique data set that surveys young adults across the U.S. on their use of and attitudes toward emerging/novel substances.

<u>Nebraska</u>

| Investigator: | Shilpa Buch, Ph.D. |
|--------------------------|---|
| Institution: | University of Nebraska Medical Center |
| Project Title: | HIV Tat & Cocaine-Mediated Induction of Astrogliosis: |
| | Role of ER Stress in HAND |
| Research: | Basic Research |
| Research Area: | HIV; Cocaine; HIV-associated Neurological Disorders (HAND); Endoplasmic Reticulum Stress (ER Stress); HIV- 1 Tat; Chronic Neuroinflammation; Glial Fibrillary Acidic Protein (GFAP); Cell Signaling; Astrogliosis; Cytokines |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: The intern should have a demonstrated interest in science and a desire to conduct research. Good communication skills are a must. In this application the intern will not have contact with animals or tissue samples. Prior research experience is preferred but no required.

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

<u>New Hampshire</u>

| Investigator: | Alan J. Budney, Ph.D. |
|--------------------------|---|
| Institution: | Dartmouth College |
| Project Title: | Behavioral Treatment of Adolescent Marijuana Use |
| Research: | Clinical Research |
| Research Area: | The major goal of this project is to further develop and test |
| | innovative behavioral treatments for adolescents who abuse |
| | marijuana, and to begin to understand the mechanisms of |
| | change involved in the treatment process. Working |
| | Memory Training and Intensified Contingency |
| | Management will be evaluated in a SMART design study. |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Intern Qualifications include: (a) a strong interest in research and the topic area or interest in clinical behavioral research methods, (b) completion of senior year in high school and enrollment in undergraduate college, (c) strong sense of responsibility, (d) ability to communicate effectively with co-workers, (e) ability to follow directions accurately, (f) attention to detail, (g) at least 18 years of age. No previous research experience is required, but is preferred. This position requires work with humans, and potentially with biological specimens (urine, breath, saliva). There is no contact with animals.

Program Description: Our intern will assist the existing clinical research staff with all aspects of conducting a clinical trial evaluating an outpatient treatment for adolescents with substance use problems. The project enrolls teens and families seeking treatment into one of two treatment conditions. Both involve behavioral counseling and abstinence-based incentive programs, and the experimental condition includes a computerized working memory training designed to improve executive function and help with impulsive decision making. Our intern will have the opportunity to observe interviews, assist with administering comprehensive assessments and data collection, data management, data interpretation, attend team meetings, engage in background reading, and attend seminars. Opportunities will also be available to observe and assist with other ongoing projects that use similar behavioral procedures (treatment of co-occurring marijuana and tobacco use, teen type 1 diabetes). Depending on the intern's interests, an independent project or review paper can be arranged.

New York

| Investigator: | Anjali M. Rajadhyaksha, Ph.D. |
|--------------------------|---|
| Institution: | Weill Cornell Medical College of Cornell University |
| Project Title: | The Role of Cav1.2 L-type Ca2+ channels in Cocaine- |
| | Induced Reinstatement |
| Research: | Basic Research |
| Research Area: | Cocaine addiction, Calcium signaling, Behavior, |
| | Molecular, Mouse models |
| Earliest Start Date: | 6/15/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

Student Qualifications: A highly motivated and hardworking student pursuing undergraduate studies majoring in a biology-related subject. Student should be interested in molecular mechanisms of drug addiction. Students will conduct molecular experiments (western blots, genotyping, quantitative PCR) using mouse brain tissue and will also have the opportunity to work with mice. Experience with basic lab techniques through prior research lab experience or lab courses is required.

Program Description: Relapse to cocaine use is a serious public problem and represents a primary challenge that exists for the treatment of cocaine addicts. Despite extensive investigation, molecular substrates that can serve as potential therapeutic targets to prevent relapse are limited. Thus, understanding the mechanisms of relapse and identifying new molecular targets for developing pharmacological treatments will greatly aid the field of addiction research. My laboratory's research focus is to examine the role of voltage-gated Cav1.2 and Cav1.3 L-type Ca2+ channels and their brain signaling pathways, in the molecular and behavioral changes that result from cocaine exposure. Using preclinical mouse models, my laboratory has made great progress identifying a role for Cav1.2 and Cav1.3 channels and their signaling pathways in cocaine's addictive properties. We utilize a combination of pharmacological agents, genetic mutant mouse lines, molecular, epigenetic and behavioral techniques to address our research questions to better understand the mechanisms of cocaine addiction. Our long-term goal is to identify molecular targets for developing pharmacological treatments for cocaine addicts.

| Investigator: | Congwu Du, Ph.D. |
|--------------------------|--|
| Institution: | State University of New York at Stony Brook |
| | Stony Brook, NY |
| Project Title: | Calcium-related Neurotoxicity of Cocaine |
| Research: | Basic Research |
| Research Area: | Optical Neuroimaging, cerebral hemodynamic and |
| | signaling, brain connectivity |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Undergraduate students who are highly-motivated with research background in imaging, or experience with animal models or animal self-administration of drug are preferred

Project Description: Cocaine affects both cerebral blood vessels and neurons in the brain. Imaging technologies such as fMRI, PET, optical microscopy and near-infrared imaging have been used to assess the acute and chronic effects of cocaine. However, the mechanisms underlying cocaine's neurotoxic effects are still not fully understood, partially due to the technical limitations of current techniques to differentiate vascular from neuronal effects at sufficiently high temporal and spatial resolution. To solve this problem, we have developed a multimodal imaging platform by combing multi-wavelength laser speckle imager (MW-LSI) and optical coherence tomography (OCT). While MW-LSI provides a large FOV, high spatiotemporal resolution, and simultaneous mapping of hemodynamic, metabolic and cellular changes in responses to cocaine, OCT is capable of quantifying directional 3D CBF vascular network. The new imaging tool permits to distinguish the vascular versus the neuronal responses of the brain in response to a pharmacological challenge, thus complimenting other neuroimaging modalities (e.g., PET, fMRI) for investigating brain functional changes such as those induced by drug of abuse.

<u>New York</u>

| Investigator: | Cristiane Duarte, Ph.D., M.P.H. |
|--------------------------|--|
| Institution: | Columbia University |
| Project Title: | Substance Use/Abuse & HIV/STI Risk Behaviors in Puerto |
| | Rican Youth Growing Up |
| Research: | Epidemiology Research |
| Research Area: | Substance Abuse, Latino Populations, Longitudinal, |
| | Epidemiology |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: §Bachelor's degree (or almost finishing) in psychology, anthropology, social work, behavioral science, human development, public health or a related social science field.

1. Must be fluent in Spanish (speaking, reading, and writing).

2. Must be available to work on evenings and weekends.

3. Detail-oriented, reliable, and able to work independently.

4. Must be a team player and demonstrate an ability to effectively interact with investigators, participants and other research assistants.

Program Description: The Boricua Youth Study (BYS) is an epidemiological research study assessing mental health in a community sample of Puerto Rican youth. The BYS collected 3 waves of data, from 2000 to 2004, that focused on antisocial behaviors and mental health outcomes of children and parents of Puerto Rican descent across two sites: South Bronx, NY (mainland) and San Juan, PR (island). BYS youth participants are now transitioning into emerging adulthood (ages 16-26), which presents a unique opportunity to understand the development of Latino youth in a critical developmental period. The fourth wave of this study aims to 1) better understand the effects of acculturation and environment on mental health outcomes and 2)understand the development of various risky behaviors (i.e. substance use/abuse, HIV/STI sexual risk behaviors, antisocial behaviors). Interns will have the chance to increase knowledge on how to communicate with the Latino community and be involved in participant tracking and recruitment (conducting telephone calls/home visits in English and Spanish), data entry, and quality control. In addition, other opportunities may include quality control (reviewing of interviews, storage of identifying information, and post-data collection procedures), learning new computer software's, contributing to a growing list of resources for services available to the public, learning about the findings of previous or current waves, and access to an excellent interdisciplinary team of researchers.

| Investigator: | Judith Brook, Ed.D. |
|--------------------------|--|
| | Kerstin Pahl, Ph.D. |
| Institution: | New York University School of Medicine |
| | New York, NY |
| Project Title: | Longitudinal Pathways to HIV Risk Behaviors among |
| - | African American and Latina Women |
| Research: | Basic Research |
| Research Area: | Psychosocial, Risk and Protective Factors, Longitudinal, |
| | Developmental, and Quantitative |
| Earliest Start Date: | 6/6/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Psychology or sociology major; One or more courses in research methodology; an interest in ethnic studies and research; some experience in working on a research project.

Project Description: Our study investigates the longitudinal, developmental pathways to HIV risk behaviors in an urban sample of African American and Latina women. We will examine the integration of a number of individual, interpersonal, and environmental factors involved in HIV risk behaviors, such as depression, substance use, low parental attachment, and neighborhood/socioeconomic disadvantage, among others.

We will also identify resource factors such as ethnic pride, abstinence from drug use, and social support that will offset the risks. Gender and power issues will be explored as they apply to HIV risk behaviors among women of color. The participants consist of 450 women in their 30's who were previously interviewed at four points in time in adolescence, emerging adulthood, and young adulthood. The intern will be introduced to and participate in a number of research activities, including data collection, data management, statistical techniques, developing hypotheses, conducting literature reviews, and preparing research articles for publication.

New York

| Investigator: | Elise Dunlap, Ph.D. |
|--------------------------|--|
| Institution: | National Development and Research Institutes, Inc. |
| Project Title: | Bath Salts & the Illicit Drug Market: Use, Violence & |
| | Health Consequences |
| Research: | Other |
| Research Area: | Adverse Effects; Amphetamines; Behavioral Health; |
| | Cathinones; Cities; Cocaine; Consumption; Designer |
| | Drugs; Drug Abuse; Drug Market; Drug User; Ecstasy; |
| | Ethnography; Focus Groups; Illicit Drugs; Ingredients and |
| | Chemicals; Legal; Life Experience; Methamphetamine; |
| | Mollies; Perception; Price; Process; Public Health |
| | Relevance; Risk; Safety; Sales; Salts; Social Environment; |
| | Surveys; Violence |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: The intern must be a college undergraduate who demonstrates an interest in learning about illicit drug markets, drug use and related social problems including HIV/AIDS and violence. Previous research experience is not required, but the student must have a good handle on using computers, email and software programs for Windows, and a willingness to learn new software. The student also should have good writing and organizational skills and the ability to conduct library and Internet searches.

Program Description: This project is investigating the social processes involved in the sale and consumption of synthetic cathinones ("bath salts") and related illicit substances in four U.S. cities: New York, New Orleans, Houston and Galveston, Texas. The study aims to document: 1) varieties of bath salts and related substances sold on the illicit drug market, how they are sold and how they change over time; 2) how and under what circumstances violence occurs in relation to bath salts use and sales; and 3) use practices, conduct norms and health consequences associated with use. Field staff in all sites are conducting individual qualitative interviews, focus groups and a computer-assisted survey. The student intern will be based in the New York City home site, and will work mainly with the qualitative data. S/he will receive training in qualitative data base management and will gain hands-on experience entering data and helping with quality control by listening to interview audio files and correcting transcription errors. The intern will also receive training in basic qualitative data coding and analysis to help the investigators prepare for fall presentation deadlines. The intern will attend biweekly meetings with New York field staff and project management, and with off-site field staff participating by telephone. The student also will be required to attend certain NDRI seminars and/or Training Institute courses, where s/he will learn about drug use and related social problems.

| Investigator: | Gail Wasserman, Ph.D. |
|--------------------------|---|
| Institution: | Columbia University |
| | New York, NY |
| Project Title: | Translational Research on Interventions for Adolescents |
| | in the Legal System |
| Research: | Implementation Science Service System |
| Research Area: | Implementation Science, Service System Linkage, |
| | Juvenile Justice, Substance Use Screening, Assessment |
| | And Referral, Juvenile Probation, Data-Driving Decision |
| | Making Training, Evidence Based Practices |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: college graduate, interest in services research, implementation science, improving identification and service linkage for youth in contact with the juvenile justice system via training on data-driven decision making

Project Description: The burden of unmet mental health and substance use need and HIV risk among youths in the juvenile justice system is alarmingly high. A behavioral Continuum of Care approach, emphasizing coordination of services across multiple sectors of care, has promise for addressing unmet needs across these domains. Although evidence-based practices (EBPs) for identification, referral, and treatment of behavioral health problems in justice-involved youths exist, they are rarely implemented in routine practice. Based on our prior success in NYS juvenile probations, our expertise uniquely positions us to address identification and linkage, which initiates the operation of the behavioral health continuum.

Compared to standard care, our earlier efforts boosted POs' use of targeted linkage practices that related, in turn, to increased service access. Here (Connect Plus) we expand earlier efforts to address substance use and HIV risk (via screening, referral practices, and interagency collaboration). We propose a multi-stakeholder Research Center to promote EBPs addressing challenges in juvenile probationers' linkage to behavioral health services. We are guided by the Comprehensive Framework for Implementation Research (CFIR) to support acceptability, feasibility, and sustainability.

Our summer intern will assist in the development/implementation of training materials for the two planned trainings that are planned for the Intervention Phase of the project. S/he will participate in scheduled workgroup conference calls and in our local research center meetings. In addition, s/he will be involved in the planned Needs Assessments for our 6 sites. During his/her internship, we will encourage him/her to attend weekly Child Psychiatry Grand Round and other routine seminars.

| Investigator: | Gregory Homish, Ph.D. |
|--------------------------|---|
| Institution: | State University of New York at Buffalo |
| | Buffalo, NY |
| Project Title: | Substance Use in Reservists: Social and Environmental |
| - | Influences |
| Research: | Epidemiology Research |
| Research Area: | Nonmedical Use Of Prescription Drugs; Tobacco; |
| | Alcohol; Stress; Trauma; PTSD; Depression; Intimate |
| | Partner Violence; Marital Functioning |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Students should be pursuing an undergraduate degree in a health related or social sciences field (e.g., public health, premedicine, and psychology). Students should be interested in research related to mental health (e.g., depression, PTSD, anxiety, trauma) and health behaviors (e.g., substance use, aggression) among adults. Ideally, students should also be interested in social networks (e.g., families, friend/peers). Students should have the ability to work well in teams and have excellent attention to detail.

Project Description: This project will consider individual-level risk factors and the influence of social (e.g., partner/peer behaviors) and environmental (e.g., life stress) factors on changes in substance use in US Reserve Soldiers. Substance abuse is the most common health problem among veterans and substance use is linked to trauma, either in combat or at home. These issues are of heightened concern among the Reserve as they have more drinking problems and more interpersonal conflict relative to active duty soldier's post-deployment. With more than half of the Military currently married, it is important to examine the potential of a Reservist to influence, or be influenced, by his/her partner. Social/environmental influences may be particularly important for Reserve Soldiers and their partners as social networks change during deployments. Thus, the proposed study will examine within- and cross-partner influences and peer influences on the association between stress and substance use for Reserve Soldiers and their partners. Reserve Soldiers and their partners (N = 400 couples) will be assessed 3 times over 2 years (i.e. baseline, Year 1, Year 2). This project will examine: 1) changes in substance use (alcohol, tobacco, and nonmedical use of prescription drugs) over time in Reserve Soldiers and their partners on the basis of individual (e.g., depressive symptoms), relationship (e.g., partner and peer substance use), community (e.g., workplace/deployments) and societal (e.g., norms) factors; 2) the relation between stress/trauma (e.g., combat exposure/life stress) and substance use; 3) how the integration of substance use into the relationship impacts marital aggression. Importantly, each member of the couple will provide independent data. The knowledge gained from this study will enhance the development of effective treatments that address the complex issues faced by military couples; some of which could generalize to civilian couples that face similar issues.

| Investigator: | Paul Kenny, Ph.D. |
|--------------------------|---|
| Institution: | Icahn School of Medicine at Mount Sinai |
| | New York, NY |
| Project Title: | Escalation of Cocaine Self-Administration in Mice |
| Research: | Drug Development Research |
| Research Area: | Addiction, Extended Access, Behavior, Catherization |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

Student Qualifications: Running a self-administration experiment in mice is challenging, and we require applicants to have the following skills:

- Comfortable handling animals
- Precise execution of experiments with attention to detail
- Good record keeping and observational skills
- Clean work habits

Project Description: Escalation of cocaine intake in animal models mimics loss of control over drug use in humans, which is a hallmark characteristic of addiction. Previous work has shown that extended access to cocaine self-administration in rats led to a gradual day-by-day escalation of cocaine intake. On the other hand, restricted access to cocaine self-administration led to stable cocaine intake. Considering the availability of a wide variety of genetically altered mouse-lines, it would be ideal to study escalation of cocaine intake in mice. However, in the laboratory, self-administration experiments with mice have so far not led to escalation of cocaine intake during extended access. Size, volume and pharmacokinetic differences between these two species might all contribute, and the current project is focused on finding the optimal parameters for self-administration under extended access conditions in mice, to allow for escalation of cocaine intake. Once this model is established in mice, the underlying genetics and neural circuitry of escalation can more easily be studied, in order to facilitate the development of novel medications for human addicts.

| Investigator: | Paul Meyer, Ph.D. |
|--------------------------|--|
| Institution: | University at Buffalo |
| | Buffalo, NY |
| Project Title: | Integrated GWAS of Complex Behavioral and Gene |
| | Expression Traits in Outbred Rats |
| Research: | Basic Research |
| Research Area: | Drug addiction, Behavioral Genetics |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Project Description: This project will study animal models of five psychological traits (sensation seeking, inattention, impulsivity, habituation, and the attribution of incentive salience) thought to underlie behavioral regulation and to be related to drug abuse. Some or all of these psychological traits are thought to predispose individuals to drug addiction. The relationship of these traits to each other and the degree to which the traits, both individually and together predict cocaine cue preference will be determined. The genetic basis of these psychological traits will be determined in conjunction with Project 4.

Specifically, we propose to phenotype 1600 male and female N/ N/NIH heterogeneous stock (HS) rats using 6 behavioral tasks. Each rat will be tested using locomotor response to novelty, light reinforcement, delay discounting, choice reaction time, Pavlovian conditioned approach, and cocaine conditioned cue preference procedures. Ten behavioral phenotypes will be derived from these tasks and used to define the five psychological traits listed above. Individual differences in the behavioral phenotypes and psychological traits will be used to perform a statistically sophisticated latent trait analysis to investigate how the behavioral phenotypes and psychological traits are related to each other and to cocaine cue preference. These data will also be used for a genome wide association study (GWAS) to determine the genetic basis of these traits (Project 4).

Upon completion of Project 3, we will have an in-depth understanding of the relationships between the behavioral phenotypes, psychological traits and cocaine conditioned cue preference. The results of the analysis, which may be different for each sex, will be reviewed with the goal of determining how well the psychological traits predict cocaine cue preference and more generally their contribution to an overall model of behavioral regulation.

| Investigator: | Perry Halkitis, Ph.D. |
|--------------------------|---|
| Institution: | New York University |
| | New York, NY |
| Project Title: | Syndemic Production among Emergent Adult Men |
| Research: | Basic Research |
| Research Area: | HIV, STIs, gay & bisexual men, sexual behavior, |
| | substance use, mental nearth |
| Earliest Start Date: | 5/30/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

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

Project Description: The Project 18 Cohort Study follows the development of syndemics among a racially/ethnically diverse group of young gay, bisexual and other men who have sex with men. Participants are asked about their sexual behavior, substance use, mental health burden and relationships; they also receive HIV and STI testing. Interns would contribute to the study by participating in community outreach to recruit new participants into the study. They would contribute to data collection by assessing participants; this involves asking them about their social networks, sexual behaviors and substance use. Interns would also screen participants for eligibility, conduct data entry and contact participants for their follow-up appointments.

| Thomas Mariani, Ph.D. |
|--|
| University of Rochester |
| Comparative Transcriptomic Signatures of Inhaled |
| Tobacco Smoke |
| Other |
| Biomarkers, Transcriptomics, E-cigarettes, Toxicology, |
| Lung biology, Respiratory disease |
| 6/1/2016 |
| Yes |
| Undergraduate |
| None Listed |
| |

Student Qualifications: Applicants with at least nominal experience with molecular and/or cell biology procedures would be most productive in this internship environment. Likewise, this opportunity would be most suitable for someone with an interest in pursuing laboratory-based research as a primary career path.

Program Description: Rationale Tobacco smoke exposure, either primary or passive, cause's pulmonary inflammation or a significantly increased life-long risk for numerous lung diseases. Unfortunately, while the health risks of tobacco smoke exposure are widely-appreciated, and rapid progress is being made in the identification of smoke-induced disease mechanisms, there are no existing in vitro tests to ascertain risks associated with exposure burden or different types of tobacco products. This is an important knowledge gap we intend to address in a way that will help the FDA to fulfill its regulatory mission.

Hypothesis: Specific, reliable changes in the transcriptome can serve as quantitative and qualitative gene expression biomarkers of tobacco smoke exposures that are accurate and predictive of human disease risk.

Aim 1: Use cell models to develop regulatory-appropriate assays for tobacco smoke exposure.

Aim 2: Utilize animal models to define disease-relevant transcriptomic responses to inhalation of specific tobacco types and doses.

Aim 3: Assess the human disease relevance of specific gene expression biomarkers.

<u>New York</u>

| Investigator: | Timothy Cardozo, M.D., Ph.D. |
|--------------------------|---|
| Institution: | New York University School of Medicine |
| | New York, NY |
| Project Title: | Combined Cocaine and HIV Vaccine |
| Research: | rug Development Research |
| Research Area: | Anti-addiction and anti-HIV vaccine development |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | 16 |

Student Qualifications: The student should have taken high school chemistry and biology. The student should have used computers such as Mac or Windows based laptops daily to do their high school homework. The student should have their own email address that they are currently using daily for easy contact during the internship. Other than this, no prior experience is required.

Project Description: The internship consists of a training phase for 4 weeks during which the student will attend classroom lectures on basic chemistry (periodic table, electrons, etc) and basic biochemistry (amino acids and proteins). During the training phase, the student will also pursue a computer tutorial on molecular modeling on their own, and perform basic exercises in the laboratory such as making solutions, learning safety procedures etc. The general and specific project will also be described to the student during the training period. After the training period, the student will perform design and analysis experiments on the computer, and will perform experiments at the lab bench. Throughout the internship, the student will be asked to present their project in both written and oral form. During the last week of the internship, the student will present their results formally in the weekly lab meeting.

| Investigator: | Yasmin Hurd, Ph.D. |
|--------------------------|---|
| Institution: | Icahn School of Medicine at Mount Sinai |
| Project Title: | Neurodevelopmental effects of cannabis |
| Research: | Basic research |
| Research Area: | Neurodevelopmental Effects of Cannabis |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | 18 |

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

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

North Carolina

| Investigator: | Kathryn J. Reissner, Ph.D. |
|--------------------------|---|
| Institution: | University of North Carolina |
| Project Title: | Contributions of Glial Glutamate Transport and |
| | Transmission to Drug Abuse |
| Research: | Basic Research |
| Research Area: | Addiction, Cocaine, Astrocyte, Neuron, Rat, Self- |
| | Administration, Synaptic Plasticity, Reinstatement, |
| | Glutamate Transporter, Cytokine |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

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

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

<u>North Carolina</u>

| Investigator: | Lisa M. Tarantino, Ph.D. |
|--------------------------|---|
| Institution: | University of North Carolina |
| Project Title: | Organismal and Genetic Networks in Drug Reward and |
| | Reinforcement |
| Research: | Basic research |
| Research Area: | Cocaine, Addiction, Genetics, Genomics, Behavior, Stress, |
| | Impulsivity, Dopamine |
| Earliest Start Date: | 5/18/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: Our laboratory primarily conducts basic research using animal models in the areas of neurobiology, behavior and genetics. A particular set of skills 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! Students will be required to work with live laboratory mice.

Program 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. Moreover, initial locomotor sensitivity is often correlated with propensity to self-administer psychostimulants in operant paradigms. We have identified an inbred mouse strain, I/LnJ, which shows normal locomotor activity but an exaggerated locomotor response to cocaine. I/LnJ mice show normal acquisition of cocaine self-administration, but are highly motivated to obtain drug under a progressive ratio schedule of reinforcement. Moreover, I/LnJ mice show a significantly extended response to acute stress indicating a potential link between the hypothalamicpituitary-adrenal (HPA) axis and drug reward. Finally, I/LnJ mice show compulsive behavior another predisposing factor for addiction liability. The summer research project would involve further characterization of these mice in additional behaviors including learning and memory, impulsivity and drug reward. In addition, baseline measures of dopamine both prior to and after exposure to cocaine and stress will be obtained using fast scan cyclic voltammetry in collaboration with another laboratory on the UNC campus. The data from these experiments will aid in the characterization and development of this line of mice as a model for addictionlike behavior and lead to further genetic analysis.

North Carolina

| c Galizio, Ph.D. |
|---|
| ersity of North Carolina, Wilmington |
| s of Abuse and Memory Span |
| c research |
| vioral Pharmacology, Drug Effects on Memory and |
| iition, Animal Models |
| 2016 |
| |
| School/Undergraduate |
| e Listed |
| |

Student Qualifications: Seeking students with strong interests in psychology, biology and/or neuroscience. No prior experience is necessary but a background in psychology and neuroscience is helpful. Students should be interested in and comfortable with handling and using laboratory rats to study the effects of drugs on memory and behavior.

Program Description: Drugs of abuse are associated with a variety of cognitive deficits including disruption of learning and memory. Animal models are needed to better assess the cognitive risks of use and abuse of psychoactive drugs. Research in our laboratory has developed new ways of studying working and episodic memory in rats using olfactory stimuli. Ongoing experiments are determining the acute effects of drugs of abuse and other selected compounds that are thought to interfere with memory using the span procedure including benzodiazepines such as flunitrazepam (roofies), NMDA antagonists (dizocilpine, ketamine), psychostimulants (methylphenidate--Ritalin, methamphetamine, MDMA--ecstasy), and an anticholinergic hallucinogen (scopolamine). These studies are increasing our understanding of the effects of drugs on working and episodic memory and are also leading to new insights into the neurochemical pathways associated with different memory processes. Students are engaged in every aspect of my research program and this summer experience will provide opportunities for students to develop research skills and increase their understanding of behavioral pharmacology and cognitive neuroscience. These experiences will include learning to train and perform behavioral tests with rats using MED State software, data collection and analysis, and readings/discussion about drug abuse and behavioral pharmacology in lab meetings.

<u>Ohio</u>

| Investigator: | Natasha Slesnick, Ph.D. |
|--------------------------|---|
| Institution: | The Ohio State University |
| | Columbus, OH |
| Project Title: | Suicide Prevention among Substance Abusing Homeless |
| | Youth |
| Research: | Homelessness, Youth, Suicide, Substance Use, Clinical |
| | Trial |
| Earliest Start Date: | 5/16/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: The literature is characterized by a dearth of information on interventions for homeless youth, and no suicide prevention intervention has been tested with these youth. Such focus is critical as suicide is the leading cause of death among homeless youth. Therefore, this NIDA funded study seeks to address this gap in knowledge with the goal to identify an effective strategy to intervene in suicide in this population. Some predictors of suicide among homeless youth have been identified. These include substance use, childhood physical and sexual abuse, victimization experiences while living on the streets, and psychological functioning, including depression, hopelessness, distress tolerance, impulse control, social support, and problem solving. Consonant with the pilot R34 announcement, this study's goal is to pilot test an intervention that has previously demonstrated feasibility and promise with adolescent suicide attempters (Brent et al., 2009; Stanley et al., 2009) and efficacy with a low-income sample of adults, "The Cognitive Therapy Intervention for Suicide Attempters" (Brown et al., 2005). One-hundred fifty homeless youth with recent severe suicide ideation will be randomly assigned to the experimental cognitive therapy for suicide prevention (CTSP) + services as usual (SAU) (n=75) or to SAU alone (n=75). SAU includes those services normally offered through a local drop-in center. Follow-up assessments will be conducted at 3, 6, and 9-months post-baseline.

Student Qualifications: While prior research is experience is not necessary, students should be interested in gaining experience in clinical research within the social and behavioral sciences. Examples of majors consonant with this work include psychology, counseling and social work. This program would be a good fit for those interested in working with marginalized, low-income adolescents and young adults, substance using homeless youth, and suicide prevention.

<u>Ohio</u>

| Investigator: | Elizabeth A. Skowron, Ph.D. |
|--------------------------|---|
| Institution: | University of Ohio |
| Project Title: | Suicide Prevention among Substance Abusing Homeless |
| | Youth |
| Research: | Clinical Research |
| Research Area: | Homelessness, Youth, Suicide, Substance Use, Clinical |
| | Trial |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: While prior research is experience is not necessary, students should be interested in gaining experience in clinical research within the social and behavioral sciences. Examples of majors consonant with this work include psychology, counseling and social work. This program would be a good fit for those interested in working with marginalized, low-income adolescents and young adults, substance using homeless youth, and suicide prevention.

Program Description: The literature is characterized by a dearth of information on interventions for homeless youth, and no suicide prevention intervention has been tested with these youth. Such focus is critical as suicide is the leading cause of death among homeless youth. Therefore, this NIDA funded study seeks to address this gap in knowledge with the goal to identify an effective strategy to intervene in suicide in this population. Some predictors of suicide among homeless youth have been identified. These include substance use, childhood physical and sexual abuse, victimization experiences while living on the streets, and psychological functioning, including depression, hopelessness, distress tolerance, impulse control, social support, and problem solving. Consonant with the pilot R34 announcement, this study's goal is to pilot test an intervention that has previously demonstrated feasibility and promise with adolescent suicide attempters (Brent et al., 2009; Stanley et al., 2009) and efficacy with a low-income sample of adults, "The Cognitive Therapy Intervention for Suicide Attempters" (Brown et al., 2005). One-hundred fifty homeless youth with recent severe suicide ideation will be randomly assigned to the experimental cognitive therapy for suicide prevention (CTSP) + services as usual (SAU) (n=75) or to SAU alone (n=75). SAU includes those services normally offered through a local drop-in center. Follow-up assessments will be conducted at 3, 6, and 9-months post-baseline.

Oregon

| Investigator: | Elizabeth Stormshak, Ph.D. |
|--------------------------|---|
| Institution: | University of Oregon |
| Project Title: | Parenting to Prevent Substance Use in Late Adolescence |
| Research: | Basic Research |
| Research Area: | Behavioral health; Mental health; Substance use; HIV risk |
| | and Prevention; Racial/Ethnic Disparities. |
| Earliest Start Date: | 5/2/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Program Description: The Family Check-Up (FCU) is an effective intervention to reduce substance use and risk behaviors while enhancing protective factors that lead to healthy, adaptive behavior. We currently focus on the transition to adulthood, the period with the highest rates of substance use and other risk behaviors (e.g., high-risk sexual behavior; drinking and driving).

We are following up an existing community sample of 593 diverse youth and their families who were originally recruited at age 11 as part of a school-based, family-centered intervention for substance use prevention. This project, Project Alliance 2, was initially funded in March 2005 by NIDA (DA 018374). Thus far the sample has shown high rates of substance use: about 35% report marijuana use on a monthly or greater basis.

Participating youth are now 20-22 years old. Families assigned to the original treatment condition are now being offered an additional intervention that targets parent—youth relationships during early adulthood, and provide critical information about developmental changes in family processes that protect youth from substance abuse during this period.

The recent legalization of marijuana in Oregon provides us an exciting opportunity to examine the impact of legalization on patterns of usage and risk outcomes. A student intern would have the opportunity to use our rich longitudinal data set to explore these questions to help us understand the impact of marijuana legalization.

Oregon

| Investigator: | Julie C. Rusby, Ph.D. |
|--------------------------|---|
| 8 | John M. Light, Ph.D. |
| Institution: | Oregon Research Institute |
| Project Title: | Peer Influence and Selection Mechanisms Underlying |
| | Adolescent Problem Behaviors |
| Research: | Epidemiology Research |
| Research Area: | Substance Use, Adolescence, Antisocial Behaviors, Risky |
| | Sexual Behaviors, Peer Networks, Ecological Momentary |
| | Assessments |
| Earliest Start Date: | 6/20/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Career interests should align with project goals; an interest in Hispanic/Latino populations would be beneficial. No prior research experience is necessary. Intern(s) will be working with high school student participants assisting with summer iPod assessments. Spanish-speakers preferred but not required. An interest in technology would align with project use of computer-based assessments and iPod Touch surveys but is also not required.

Program Description: Affiliation with deviant peers is known to increase the risk of substance use, antisocial behavior, and risky sexual practices during adolescence and into adulthood. This Oregon-based project aims to develop models that forecast the risk of such problems from exposure to different social environments. Over 1,100 students are participating in this study, completing school-based surveys three times each school year from the spring of 8th grade to the fall of 11th grade. In addition, almost 500 students are doing more intensive assessments four times each year, including a summer assessment. This subsample of students are loaned iPod Touches to complete short random surveys during their free time across four days; this method of data collection provides real-time information on student's activities, locations, social environment, and moods. About 40% of the student sample identify as Hispanic/Latino. Students are reporting high rates of alcohol, electronic cigarette (e-cigarette), and marijuana use. Summer research projects include further examination of substance use, an initial examination of antisocial behavior, and an initial examination of risky sexual behaviors. Other areas of interest are how pubertal timing (developing earlier or later than one's peers) is related to problem behaviors and how physical activity is related to being around peers. Finally, there are opportunities to explore gender and ethnic differences across many variables of interest.
Oregon

| Investigator: | Leslie Leve, Ph.D. |
|--------------------------|---|
| Institution: | University of Oregon |
| | Eugene, OR |
| Project Title: | Siblings Reared Apart: A Naturalistic Cross-Fostering |
| | Study of Young Children |
| Research: | Basic Research |
| Research Area: | Children, Parenting, Siblings, Genetic |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Students should have a basic understanding of psychological research and an interest in pursuing graduate studies in psychology or a related discipline. Must be willing to be work collaboratively as part of a team. No prior research experience is required. There may be opportunities for human subject activity, but this is not a requirement.

Project Description: In this research program, we are interested in the ways that families contribute to their children's healthy and successful development. We do this by studying the associations between aspects of child development (including peer relations, school behavior, problem behavior, and social skills) and aspects of the family (including parenting practices, martial relationships, economic resources, and substance use in the family). In this study, we are interviewing 215 families across the United States who are currently parenting a biological child who is 7 years old. We conduct telephone interviews with the parents, and will also visit families in their homes to record some of their family interactions on digital media. We also have data on the child's biological sibling, and a goal of the study is to see how similar or different the two siblings are and how any differences relate to the parenting they receive. Students involved in the summer research internship will attend weekly meetings with our research team to discuss and problem-solve issues we are having in the study, and hear information about our research findings. They will read one article a week related to the study purpose, and will review and practice the interview procedures under the mentorship of members of our research team. They will also participate in the coding team and help with literature searches. They will learn about and become familiar with the different aspects that are involved in a research study, such as IRB approval, recruitment, assessment, data management, and coding (but will not be expected to perform each of these activities). They will be given opportunities to attend research talks given on campus throughout the summer in topics related to this research program.

<u>Pennsylvania</u>

| Investigator: | Charles P. O'Brien, M.D. |
|--------------------------|----------------------------|
| Institution: | University of Pennsylvania |
| | Philadelphia, PA |
| Project Title: | Vietnam Study |
| Research: | Clinical Research |
| Research Area: | Psychiatry Addictions |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Student should have a connected degree or interest in the behavioral sciences. Can be an interest in medicine or health care. If student is high school age, must be local.

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 (Didatics); understanding of the Diagnosis and Treatment of Substance Abuse
- Participation in science meetings Weekly Speaker Sessions hosted by various investigators from the field and within the University
- Data collection activities & data analysis
- Active research study preparation, including CRF work and Assessments (may include patient contact)
- Laboratory experience/experiments (optional) includes animal research
- Library research
- Group activities includes mentor meetings and other group activities
- Final Oral Presentations on topics or studies covered during the internship.

<u>Pennsylvania</u>

| Investigator: | Elisabeth Van Bockstaele, Ph.D. |
|--------------------------|---|
| Institution: | Drexel University |
| Project Title: | Modulation of Norepinephrine by Cannabinoids |
| Research: | Basic Research |
| Research Area: | Cannabinoids, Alcohol, Stress, Norepinephrine |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | 16 |

Student Qualifications: We are looking to accommodate students eager to learn molecular and cellular techniques such as RT-PCR and western blotting. We focus heavily on neuroanatomical techniques, and thus students will have opportunities to engage in microscopy experiments as well. Students will work with rodents and their brain tissues. Prior research experience is not required. Students with a strong career interest in neuroscience and some educational background in biology and chemistry are encouraged to apply.

Program Description: The norepinephrine (NE) system plays a critical role in the modulation of emotional state, arousal, and stress responses. As the sole source of NE to the medial prefrontal cortex (mPFC), the locus coeruleus (LC) regulates cognitive flexibility and arousal, affect, and decision making regarding substance abuse through modulatory effects of NE in the mPFC. Evidence from our laboratory and others suggests that alcohol and cannabinoids significantly impact the brain NE system. Gaps exist in our knowledge regarding specific interactions between alcohol and cannabinoids in the NE system. In addition, evidence suggests a greater negative impact of alcohol on females compared to males, suggesting that the prevalence and/or severity of polysubstance abuse may have greater negative consequences in females. Thus, the project will focus on elucidating a more in-depth understanding of the effects of alcohol and cannabinoids interactions on stress-related neural circuits across the sexes. We will test the hypothesis that exposure to alcohol intensifies cannabinoid-induced dysregulation of brain NE activity. Additionally, this project will build on our preliminary data showing a sex dependent effect of chronic alcohol exposure the endocannabinoid (EC) system in the LC, which provides a potential mechanism for over-activation of brain NE circuitry following combined alcohol and cannabinoid use in females. Techniques used to conduct this research will include RT-PCR and western blotting.

Pennsylvania

| Investigator: | Prasun Datta, Ph.D. |
|--------------------------|--|
| Institution: | Temple University |
| Project Title: | Project 1 reciprocal interaction of cocaine and hiv-1 on |
| | glycolytic pathways in macrophages and microglia cells |
| Research: | Basic Research |
| Research Area: | NeuroAIDS, HIV-1, macrophage, microglia, glycolysis, |
| | metabolism, drug abuse, and cocaine |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 19 |

Student Qualifications: Undergraduate students in Biology, Neuroscience, Virology, Molecular Biology, Biochemistry are preferred. Students must have a GPA above 3.1 and should have basic biology lab skills, and communication skills. Students must be interested conducting basic research in in the field of neuroscience. Students must be punctual, reliable, hard working and have the ability to follow instructions. Student must view this as a research opportunity and not as a summer employment opportunity.

Program Description: Research in this laboratory is directed toward understanding how HIV-1 and drugs of abuse such as cocaine hijacks the genetic and cellular mechanisms involved in expression of the enzymes in the glycolytic and TCA cycle pathway in macrophages and microglia. A summer program in this laboratory will enable the student not only to learn basic molecular biology techniques such as cell culture, isolation and culture of macrophages, western blot analysis, real-time PCR but also cutting edge techniques as use of lentivirus and Cas9 technology to silence gene expression. Trainees are teamed up with postdoctoral researchers to learn specific techniques and basic concepts of metabolism and viral replication.

Pennsylvania

| Investigator: | Wenzhe Ho, M.D., M.P.H. |
|--------------------------|--|
| Institution: | Temple University |
| | Philadelphia, PA |
| Project Title: | Opioids, HIV/HCV and Host Cell Innate Immunity |
| Research: | Transnational Research |
| Research Area: | Drug abuse, HCV/HIV, Neuro AIDS, Viral Immunology, |
| | Innate Immunity |
| Earliest Start Date: | 7/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Project Description: Dr. Ho's laboratory is using multidisciplinary approaches to understand virus host interactions and the basic mechanisms that control virus replication and strategies for enhancing the innate immunity against viral infections, particularly human immunodeficiency virus (HIV) and hepatitis C virus (HCV, a major etiology of liver disease). Working closely with drug abusing populations in the regions of Philadelphia and China, the Ho laboratory is also investigating whether drugs of abuse such as heroin and methamphetamine have a cofactor role in promoting HIV and/or HCV diseases. Since HIV and/or HCV infection are frequently found in injection drug users (IDUs) and these two pathogens are likely to be responsible for the highest infectious disease morbidity and mortality rates among IDUs, Dr. Ho's laboratory is investigating the role of drug abuse in the immunopathogenesis of HIV and/or HCV diseases. Dr. Ho and his research team use in vitro, ex vivo and in vivo models to directly address the question of whether drugs of abuse (opioids and methamphetamine) have the ability to suppress host immune responses and promote HIV and/or HCV diseases. In collaboration with the investigators from the University of Pennsylvania and Wuhan CDC, studies in the Ho's laboratory have shown that drugs of abuse such as opioids and methamphetamine impair antiviral functions of host innate immune cells (natural killer cells and CD56+ natural T cells) and facilitate HIV or HCV infection/replication. Current research in the Ho's laboratory is investigating the specific effects of opioids such as heroin and morphine on type 1 IFN-mediated intracellular immunity that control HIV or HCV infection and replication. In addition, to determine whether drugs of abuse (opioids and methamphetamine) and/or HIV impair the innate immunity in human neurons and compromise the efficacy of HIV treatment (HAART) is also a focus of Dr. Ho's research.

Puerto Rico

| Investigator: | Carmen Albizu-Garrcia, M.D. |
|--------------------------|--|
| Institution: | University of Puerto Rico Medical Sciences Campus |
| Project Title: | Diversity-promoting Institutions Drug Abuse Research |
| | Program (DIDARP) |
| Research: | Drug Development Research |
| Research Area: | HIV; Addiction; Prescription Opioid Misuse; Pain; |
| | Opioids; Clinical Research; Intervention; RCT |
| Earliest Start Date: | 6/13/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: The student must have basic skills in computer use, database searches, and, basic knowledge in MS Office and spatial concepts.

Program Description: There is a growing interest in applying geographical indicator and webbased technologies (WBT) in socio-medical research. Access to health services has been an important variable in studies related to treatment for different health conditions. We will be integrating our summer intern to an emergent study that integrates geographical indicators and WBT to develop a Resource Inventory. The web application will help measure access to health services and web application development. The student will be involved in the progress phase of a study that provides the opportunity to describe the spatial distribution of the services destined to people with SUD. He/She will be supported by a Biostatistician GIS Specialist as mentor. He/She will be exposed to SUD research and will participate on activities that will help them to increase their knowledge, skills and attitude towards drug abuse research.

The students will acquire Beginner skills using MS Office and GIS tools; Work with data extraction, geo-referencing, data preparation, data edition, and presentation; Basic principles in GIS modelling, Cartography and Web-based GIS; How to apply geographic indicator in the Public Health field; knowledge on how GIS could be used to describe spatial distributions and identify gap in service.

As a culminating experience, he/she will make a presentation to the research group about the experience and findings as well of the implications of these findings in public health and society.

South Carolina

| Investigator: | Arthur Riegel, Ph.D. |
|--------------------------|---|
| Institution: | Medical University of South Carolina Charleston, SC |
| Project Title: | Relapse to cocaine-seeking: Cellular Adaptations in the VTA |
| Research: | Basic Research |
| Research Area: | Addiction, Cocaine, Stress, Dreadds, Optogenetics, Drug |
| | Self-Administration; Relapse, Behavior, |
| | Immunocytochemistry |
| Earliest Start Date: | 6/15/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Candidates should be highly motivated with 2-4 years of relevant undergraduate coursework. Students will be expected to work with rodents (rats and mice) in the context of behavioral testing. Preference would be given to individuals with prior exposure to techniques such optogenetics, designer receptors exclusively activated by designer drugs (DREADDs) or operant training in behavioral paradigms, but all interested students are encouraged to apply.

Project Description: Our laboratory in the MUSC Department of Neurosciences in Charleston SC brings together a large group of expert neuropharmacological researchers and a range of laboratory facilities to create outstanding opportunities for young people interest in a research career in the neurosciences of addiction. We are seeking an intern to assist with characterizing the expression and efficacy of novel genetic tools in operant behavioral tests to determine mechanisms responsible for relapse to drug seeking. Areas of focus include stress and environmental cues.

Tennessee

| Investigator: | Russell W. Brown, Ph.D. |
|--------------------------|---|
| Institution: | East Tennessee State University |
| Project Title: | Nicotine and the Roles of Nicotinic Receptors in a Rodent |
| | Model of Schizophrenia |
| Research: | Basic Research |
| Research Area: | Behavioral Pharmacology/Behavioral Neuroscience |
| Earliest Start Date: | 5/16/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 16 |

Student Qualifications: Most importantly, I need students to be motivated to learn about neuroscience research. It would be advantageous if the student has learned how to inject animals, has done some behavioral testing and knows generally about preclinical research. However, it's not an absolute requirement. We're a friendly group, and we all work as part of a team. I need the student to be willing to join in as part of a team instead of acting alone.

Program Description: In past work, our laboratory has analyzed the behavioral and neurochemical consequences of dopamine D2-like receptor supersensitization, and its relevance to schizophrenia. Dopamine is a neurotransmitter involved motor function and reward, and it binds to two families of receptors: The D1 and D2. Through early developmental administration of the drug quinpirole, which acts as an agonist to dopamine D2 receptors, the dopamine D2 receptor is increased in its sensitivity. This increase in sensitivity does not result in a change in receptor number, and persists throughout the animal's lifetime. Over several years of work, we have found that neonatal quinpirole treatment enhances behavioral sensitization and rewarding effects of nicotine. This is especially important because approximately 80% of schizophrenics smoke cigarettes, and they smoke heavily. Ultimately, this results in a poor quality of life and shortens the average lifespan in a smoking schizophrenic. Our primary interest here is to try to identify behavioral and neurobiological targets for treating smoking in schizophrenia. In a second line of research, we have been investigating the effects of methylphenidate (trade name: Ritalin) on behaviors related to addiction. We are also analyzing the effects of methylphenidate on brain plasticity, and currently are analyzing whether methylphenidate enhances the behavioral responses to nicotine in adolescent rats.

Texas

| Investigator: | Ashley Acheson, Ph.D. |
|--------------------------|--|
| Institution: | The University of Texas Health Science Center |
| | San Antonio, TX |
| Project Title: | Relating Brain Maturation to Impulse Control and |
| | Substance Use Development |
| Research: | Other |
| Research Area: | Brain Development, Substance Abuse, Impulsivity, |
| | Adolescent |
| Earliest Start Date: | 5/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Stated |

Student Qualification: Someone who would works well with others especially adolescents, computer literate, and has an interest to learn about human research.

Project Description: Adolescent substance use is common and associated with both significant negative individual consequences and substantial costs to society. The purpose of this study is to identify neurobiological mechanisms relating to risks and consequences of adolescent substance use. Tests are being conducted in adolescents with high and low familial risk for substance use disorders, and we are seeking to identify relationships between maturation of frontostriatal circuitry, impulse control development, and progression of substance use involvement across adolescence. We will compare circuitry between adolescents at high or low risk for substance use disorders (based on family history) before regular drug use begins; determine how individual differences in early adolescent frontostriatal circuitry development, before regular drug use, predict onset and severity of substance use; and examine how trajectories of frontostriatal circuitry development are affected by both familial risk and adolescent substance use. We posit that impulse reward-focused behaviors emerging during adolescence are at least partially driven by inadequate regulation of the striatum by the prefrontal cortex. This project integrates distinct bodies of research on brain development, adolescent substance use.

Texas

| Investigator: | Carlos Paladini, Ph.D. |
|--------------------------|--|
| Institution: | University of Texas San Antonio |
| | San Antonio, TX |
| Project Title: | Mechanisms of Cocaine Hypersensitivity following |
| | Chronic DBH Inhibition |
| Research: | Basic Research |
| Research Area: | Dopamine, Addiction, Drug Abuse, Reward Circuitry, |
| | Drain |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | High School/Undergraduate |
| Minimum Age Requirement: | None Listed |

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

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

Norepinephrine (NE) provides excitatory drive onto midbrain dopamine (DA) neurons and modulates responses to dopaminergic drugs, including psychostimulants. Chronic loss of noradrenergic tone impairs DA neuron firing and DA release, leading to compensatory alterations in postsynaptic DA receptor signaling and a paradoxical hypersensitivity to dopaminergic drugs. The goal of this proposal is to identify the molecular and cellular mechanisms underlying the behavioral hypersensitivity to cocaine following chronic inhibition of the NE biosynthetic enzyme, dopamine β -hydroxylase (DBH). Based on our preliminary data, we propose that a chronic loss of NE produces a decrease in β -arrestin2 (β Arr2) in the nucleus accumbens (NAc), which promotes a reversal in the valence of D2 responses from inhibitory to excitatory, potentially via a G α i-to-G α s switch in D2 receptor coupling. Completion of these Specific Aims will contribute to our understanding of noradrenergic modulation of mesolimbic DA transmission, the plasticity of DA receptor signaling pathways, and NE-DA interactions underlying aversive responses to drugs of abuse.

Texas

| Investigator: | Jia Zhou, Ph.D. |
|--------------------------|---|
| Institution: | University of Texas Medical Branch |
| | Galveston, TX |
| Project Title: | 5-HT2CR Allosterc Modulators as Novel |
| - | Pharmacotherapy in Cocaine Use Disorder |
| Research: | Drug Development Research |
| Research Area: | Cocaine Addiction, Drug Abuse, Chemical Biology, |
| | Medicinal Chemistry, Small Molecules, Haptens, 5- |
| | HT2C Receptor, GPCR, Allosteric Modulators, Drug |
| | Discovery, Translational Research, Chemistry |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

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, 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 in particular 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-HT2CR PAMs with a favorable drug metabolism and pharmacokinetics (DMPK) profile, and analyze select molecules in proof-ofconcept behavioral models to support therapeutic potential for cocaine use disorder. To accomplish our objective, we will: (1) design, synthesize and optimize 5-HT2CR PAMs; (2) define selectivity and specificity and DMPK profiles of 5-HT2CR PAMs in vitro; and (3) determine DMPK in vivo and efficacy of optimized 5-HT2CR 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-HT2CR allosteric modulation, and drive new concepts and directions in cocaine use disorder and anti-relapse medications.

Texas

| Investigator: | Kathryn Cunningham, Ph.D. |
|--------------------------|--|
| Institution: | University of Texas Medical Branch |
| | Galveston, TX |
| Project Title: | Translational Addiction Sciences Center: Administration, |
| | Communication, and Integration Core |
| Research: | Basic Research |
| Research Area: | Addiction Research; Addiction Sciences; Pharmacology; |
| | Toxicology; Neuroscience |
| Earliest Start Date: | 6/8/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 16 |

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; Wants to visit the Lone Star State and loves the beach!

Project Description: Cocaine abuse and dependence continue to extract considerable personal, health and societal tolls in the U.S. and the world. The cycling progressive nature of this disorder stymies efforts to stay abstinent with relapse oft precipitated by impulsive behavior and craving in the face of exposure to cocaine-associated cues (cue reactivity). Serotonin (5-HT) neurotransmission is a strategic nexus that mechanistically connects these phenotypes. The Translational Addiction Sciences Center (TASC) is comprised of a translational team bridging from molecules to cells to animals to humans with the long-term research goal to definitively reveal the role of 5-HT in addiction neurobiology and to integrate this knowledge into the dominant theoretical constructs of addiction. The central research theme of the TASC is that impulsive action and cue reactivity are mechanistically-linked to disrupted 5-HT signaling through the 5-HT2A receptor (5-HT2AR) and 5-HT2CR localized to prefrontal-striatal-thalamic circuitry. Our premise is that restoration of the 5-HT2AR:5-HT2CR balance will repair corticostriatal deficits and ameliorate relapse. The TASC is led by an experienced, translational team that melds classical and state-of-the-art methodologies, bridging chemistry, cellular biology and pharmacology with human and animal psychopharmacology to address this problem.

<u>Texas</u>

| Investigator: | Laura O'Dell Ph D |
|--------------------------|--|
| Institution: | University of Texas at El Paso |
| | El Paso, TX |
| Project Title: | Sex Differences in the Mechanisms that Promote |
| | Nicotine Reward and Withdrawal |
| Research: | Basic Research |
| Research Area: | Neuroscience; Drug Abuse; Tobacco use; Addiction; In |
| | Vivo Micro Dialysis; Behavior; Molecular Biology |
| Earliest Start Date: | 5/16/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: Biology or Chemistry Background; Physiological Psychology; Animal Handling experience.

Project Description: Our summer student will work in my laboratory as part of our Research experience for Undergraduates (REU) program entitled, "SMART: Minds." Students will focus on studies related to the parent grant ("Sex Differences in the Mechanisms that Promote Nicotine Reward and Withdrawal"-DA021274). The projects will examine developmental differences to the behavioral effects produced by nicotine and withdrawal from this drug in male and female rats. They will learn to use place-conditioning procedures to assess the rewarding and aversive effects of nicotine across these groups. The student will present their work at the end of the summer at the local College Office of Undergraduate Research (COURI) Annual Undergraduate Research Symposium. The student will also be involved in studies comparing the rewarding effects of nicotine in adolescent, adult, and adult animals that were exposed to nicotine during adolescence using self-administration procedures. This project is directly from the parent grant and is will also be completed this summer. The students will be heavily involved in the data collection of this project and will learn valuable presentation skills. As part of the summer REU they will also receive training in bioethics and other professional skills. These projects are important for the overall hypotheses in the parent grant, and publication of this work will also the students to also improve their writing skills. As a Hispanic female, I am particularly dedicated to the success of a diverse range of students and I look forward to continue mentoring students through this valuable NIDA program.

<u>Virginia</u>

| Chenming Zhang, Ph.D. |
|---|
| Virginia Tech |
| Blacksburg, VA |
| Novel Nanovaccines Against Nicotine Addiction |
| Drug Development Research |
| Vaccine, Nanoparticle, Nicotine, Nicotine |
| Vaccine, Biomolecules, Biotechnology, |
| Nanotechnology |
| 5/23/2016 |
| Yes |
| Undergraduate |
| None Listed |
| |

Student Qualifications: An ideal student will have background knowledge in chemistry and biochemistry and at least is enrolled in a university as an undergraduate. Since we conduct experiment based research, the student needs to be hands-on and is good at learning new experimental techniques. To gain the most through this summer research program, a student with previous research experience is preferred but not required.

Project Description: Smoking is a growing global problem. Chronic use of tobacco is considered a responsible factor for serious diseases such as chronic obstructive pulmonary disease, stroke, chronic lung disease, and cancer. There are more than 60 million smokers in the U.S alone. Despite the urgent need, finding ways to combat the problem has been a constant challenge to the society and the medical field. Current pharmacological therapies have shown very limited success with some serious side-effects, such as depression with suicidal behavior. On the other hand, immunopharmacotherapy or vaccination has emerged as a promising alternative. However, all current vaccines have shown limited efficacy, and thus there is undoubtedly a strong need for improved nicotine vaccines.

In this project, nanoparticle based novel nanovaccines against nicotine will be prepared. The research will involve expression and purification of recombinant proteins as potential carrier proteins for nicotine hapten, conjugating haptens to carrier proteins and other biomolecules, preparation of nanoparticles, assembly of nanovaccines, and conducting animal studies. We expect that, through successfully executing the carefully designed experiments, we will be able to identify a leading vaccine candidate that will show unprecedentedly high antibody titers against nicotine and can be advanced into clinical trials.

<u>Virginia</u>

| Investigator: | Faye Taxman, Ph.D. |
|--------------------------|---|
| Institution: | George Mason University |
| | Fairfax VA |
| Project Title: | In Person Motivational Interviewing (MI) vs. a |
| | Motivational Computer Program (MC) for Probationers |
| Research: | Clinical Research |
| Research Area: | Motivation to change, motivational interviewing, |
| | experiment, risky behaviors |
| Earliest Start Date: | 5/23/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| - I | |

Student Qualifications: The student should be familiar with office products and preferably SPSS or STATA. The student will need to work on various computer data sets with a team of researchers. Some field work may be required including going to the probation office.

Project Description: The student will be involved in coding fidelity tapes and timeline follow-back data collected on 400 probationers. The study is an experiment comparing motivational interviewing conducted by a counselor or a web-based programming on drug use, treatment initiation, and probation outcomes. Subjects are interviewed at baseline, 2 months and 6 month follow-up.

<u>Virginia</u>

| Investigator: | June Tangney, Ph.D. |
|--------------------------|--|
| Institution: | George Mason University |
| Project Title: | Borderline Personality and Inmates' Post-release Substance |
| | Abuse and HIV Risk Behavior |
| Research: | Clinical Research |
| Research Area: | Borderline Personality Disorder, Jail Inmates, Substance |
| | Dependence, HIV Risk, Recidivism, And Re-Entry |
| Earliest Start Date: | 5/23/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

Student Qualifications: Successful interns have the ability to manage multiple tasks and strong attention to detail. Interns must pass a criminal background check prior to beginning the internship. Prior research experience is a plus.

Program Description: Borderline personality disorder (BPD) is rarely discussed in the correctional literature, but a remarkably high percentage of "general population" inmates suffer from this debilitating disorder. Virtually nothing is known about crimes that bring people with BPD into the criminal justice system, how people with BPD fare while incarcerated, and the treatment and criminal justice outcomes of those with BPD. Equally unknown are the factors that enhance vs. jeopardize successful post-release reintegration into the community. To reduce substance use, HIV risk, and recidivism, and to enhance post-release adjustment, this project aims capitalize on a 10 year longitudinal study of 508 "general population" jail inmates to (1) provide clinically-relevant descriptive information on inmates with BPD, and (2) test trajectories in BPD Symptomatology and Post Release Substance Misuse, HIV risk, and recidivism. We also aim to expand our understanding of racial/ethnic and gender differences in the precursors, correlates, and consequences of BPD.

Washington

| Investigator: | Ann Duerr, M.D., Ph.D., M.P.H. |
|--------------------------|---|
| Institution: | Fred Hutchinson Cancer Research Center |
| | Seattle WA |
| Project Title: | Modulating the Impact of Critical Events in Early HIV |
| | Infection: Effect of ART Initiation and Alcohol Use |
| Research: | Epidemiology Research |
| Research Area: | Alcohol Use Disorder, HIV transmission, Men who have sex with men, Peru |
| Earliest Start Date: | 6/1/2016 |
| Housing Available: | No |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: Undergraduate or high school students interested in medicine, science or public health: the student will be mentored in epidemiologic methodology and analyses. The project includes biology and explores potential biases in self-reported data on sensitive topics. Prior laboratory experience and experience in molecular biology is not required. No contact with biologic samples, study participants or laboratory animals.

Project Description: Drug and alcohol abuse among men who have sex with men (MSM) are associated with increased risk of acquiring and transmitting HIV. In Peru, where there is a concentrated HIV epidemic among MSM and transgender women (TW), a 2011 survey of 5,148 gay and bisexual men reported alcohol use disorder in 63% of respondents, five times higher than in the general Peruvian population. Our research in Lima is investigating the impact of alcohol use on HIV transmission in 1,800 high-risk MSM and TW who are tested monthly for HIV (HIV incidence=11.2/100 person years). Participants who acquire HIV infection (HIV+) are enrolled in a treatment study; we collect self-reported data on alcohol use as well as dried blood spots and hair samples monthly.

Aim 1. Compare self-reported alcohol use to biomarkers of alcohol use in the past 30-90 days (phosphatidyl ethanol and ethyl glucuronide) among HIV+ participants. The hypothesis is that although alcohol use will decrease over time, HIV+ participants will consistently under-report their true alcohol consumption.

Aim 2. Compare alcohol reporting between HIV+ cases and a subset of HIV-negative participants who are selected as controls (using the biomarkers and study instruments in aim 1). The hypothesis is that under-reporting of alcohol and substance use will be greater in HIV+ than in HIV-negative participants. This may be due to social desirability, stigma, or fear of being ineligible for early anti-retroviral treatment.

<u>Washington</u>

| Jashvant Unadkat, Ph.D. |
|--|
| University of Washington |
| Mechanisms of Drug Disposition during Pregnancy |
| Basic Research |
| Pharmacokinetics of Drugs, Pregnancy, Matenral-Fetal |
| Exposure to Drugs, Mechanisms of Changes in |
| Pharmacokinetics, PBPK Modeling and Simulations |
| 6/1/2016 |
| Yes |
| Undergraduate |
| 18 |
| |

Student Qualification: Students who will best fit as interns will be those who have some laboratory research experience and do not have objections to working with animals or animal/human tissues. Students should be enrolled in four year college and should by sophomores, juniors or seniors majoring in a biological science or engineering.

Project Description: This program project will study the mechanisms of disposition of drugs of abuse and those used to treat abuse during pregnancy. Human, animal and in vitro studies in cells will address the aims stated in each of the three projects. A physiological model will also be created to predict the disposition of these drugs in the human maternal-fetal unit. A student who is interested in working on this project will be involved in research conducted by any one of the three projects of this grant. However, only one project is listed.

Project 1: This project will systematically investigate hepatic metabolism (e.g. buprenorphine) and placental transport (e.g. norbuprenorphine, methadone, and bupropion) of drugs that are commonly used to treat pregnant women who abuse drugs. Despite their clinical importance in the treatment of drug abuse of pregnant women, very little is known about the metabolism and placental transport of these drugs during pregnancy, and thus clinical data about changes in the pharmacokinetics (PK) or fetal exposure of these drugs are scare. This is of concern as we have previously shown that activity and/or expression of drug metabolizing enzymes (e.g. hepatic CYP3A4) and transporters (e.g. placental P-gp and BCRP) are significantly altered during pregnancy. Such changes can lead to administration of sub- or supra-therapeutic doses of drugs to the mother and/or her fetus

<u>Wisconsin</u>

| Investigator: | Christopher M. Olsen, Ph.D. |
|--------------------------|--|
| Institution: | Medical College of Wisconsin |
| | Milwaukee, WI |
| Project Title: | Mild TBI: Effects on Addiction-Related Phenotypes and |
| | Mesocorticolimbic Function |
| Research: | Basic Research |
| Research Area: | Addiction, Cocaine, Concussion, Traumatic Brain Injury |
| Earliest Start Date: | 5/25/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | 18 |

Student Qualifications: The primary qualifications are motivation, desire to learn, and patience. The student should have an interest in neuroscience, and a background in biology is desirable. Because our laboratory uses controlled substances, the student may not have been convicted of a felony and may be subject to a drug test at any time while working in the lab.

The student should feel comfortable with working with live rats (we will provide extensive training in animal handling), learning to conduct surgical procedures (a permanent catheter is implanted into the jugular vein under anesthesia to allow for daily access to intravenous drug), and working with fresh or preserved tissue (e.g., brain).

Project Description: Our collaborators (biomedical engineers) have previously developed and validated a mild blast brain injury model in rats. This model is meant to simulate mild blast injury that is frequently encountered by military personnel, and also to be a model for concussion in general. In this model, an air blast is delivered to anesthetized rats, which leads to brain injury in areas of the brain that are implicated in addiction, a common feature in human brain injury as well. This is a study to determine if the mild blast injury will alter cocaine self-administration and subsequent drug seeking in rats that have not had prior exposure to the drug.

<u>Wisconsin</u>

| Investigator: | John Mantsch, Ph.D. |
|--------------------------|---|
| Institution: | Marquette University |
| Project Title: | Glucocorticoid-Regulated Endocannabinoids And Stress- |
| | Potentiated Cocaine Seeking |
| Research: | Basic Research |
| Research Area: | Addiction, Cocaine, Stress, Corticosterone, Rat, Relapse, |
| | Endocannabinoid, Prefrontal Cortex, Preclinical |
| Earliest Start Date: | 5/26/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |
| | |

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

Project Description: The full-time 10-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. John Mantsch at Marquette University in Milwaukee, WI and participation in the Marquette College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The mentored project will involve the use of preclinical rat and mouse models to investigate the neurobiological processes through which stressful stimuli can promote relapse to drug use. More specifically, mechanisms in the prelimbic prefrontal cortex the control drug use during periods of stress will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection mini-course. At the end of the 10-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.

<u>Wisconsin</u>

| Investigator: | Paul Gasser, Ph.D. |
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| Institution: | Marquette University |
| Project Title: | Glucocorticoid Regulation of Dopamine Clearance, |
| Research: Research Area: | Cocaine Seeking, and Reward Basic Research Addiction, Motivation, Reward, Cocaine, Stress, Corticosterone, Rat, Relapse, Dopamine, Nucleus Accumbens, Preclinical |
| Earliest Start Date: | 5/26/2016 |
| Housing Available: | Yes |
| Student Level: | Undergraduate |
| Minimum Age Requirement: | None Listed |

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

Project Description: The full-time 10-week internship opportunity will consist of mentored addiction neuroscience research in the lab of Dr. Paul Gasser at Marquette University in Milwaukee, WI and participation in the Marquette University College of Health Sciences Biomedical Sciences Summer Research Program (SRP). The student's project will involve the use of preclinical rat models to investigate the neurobiological processes through which stressful stimuli can modulate motivation and reward processes and promote relapse to drug use. Specifically, mechanisms by which the stress hormone corticosterone modulates dopaminergic neurotransmission in the nucleus accumbens will be examined. Through participation in the SRP, the student will complement his/her undergraduate research projects with involvement in a range of scientific, educational, and social activities, including a weekly student-oriented faculty mentor seminar series, weekly data discussions, and a 2-day lecture and brain dissection minicourse. At the end of the 10-wk period, the student will be expected present his/her work, in poster format, to faculty, staff and other students at an undergraduate student research-focused event.