

# National Institute on Drug Abuse Summer Research Internship Program 2024



**Program:**

The NIDA Summer Research Internship Program supports all students with a focus on increasing underrepresented populations in substance abuse research. Through this program, undergraduates aged 18 and older 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 eight weeks during the summer. The internship may include laboratory experiments, data collection, data analysis, formal courses, participation in lab meetings, patient interviews, manuscript preparation, and literature reviews. In addition, it is expected that each intern will deliver a formal presentation on his/her research project at the end of the internship.

**Eligibility:**

- This NIDA Summer Research Internship Program is designed for undergraduate students to experience substance use and addiction research in the biomedical, behavioral, clinical, and social sciences. Applicants must be at least 18 years old on or before May 31, 2024, and must be U.S. citizens or permanent residents of the United States.
- Graduating 2024 college seniors are eligible to apply.
- Students must be committed to working for 8 consecutive weeks during the summer (some schedule flexibilities may be allowed).
- Individuals who have already participated in the NIDA Summer Research Internship Program are no longer eligible to apply.
- NIDA highly encourages those from diverse backgrounds, including those from underrepresented groups, to apply for this summer research experience (see NIH's Interest in Diversity).

**Scope of Support:**

- Interns will receive wages in the amount of \$15.00 per hour for a maximum of \$4,800 for eight (8) weeks.
- Internship experiences are in-person.
- Interns may receive a housing reimbursement for up to \$2,500 (upon sending NIDA proper documentation of these expenses) if they are required to travel to a different state for their internship. After accepting an internship position, the intern will be required to cover any additional costs for housing and other expenses accrued including but not limited to utilities, cable, Wi-Fi, and meals. NIDA understands that some locations have a higher cost of living and additional housing support will be considered with proper documentation on a case-by-case basis.
- Interns may also receive a travel reimbursement for up to \$500 for travel to and from the internship site, including but not limited to: bus, train, metro, airplane, uber, taxi, and parking.

**As a NSRIP intern, you are agreeing to:**

- Be punctual and respectful and abide by the policies of the research lab (confidentiality, dress code, safety protocols, facility access, etc.).
- Participate fully in the complete 8-week research experience.
- Keep a record of your hours worked and accurately report these hours as per the arrangement with your internship site. Provide your supervisor with advanced notice when requesting any changes to your schedule.

- Be fully responsible for securing your housing and travel arrangements. Provide proper documentation to the NIDA contractor (Rose Li & Associates) when seeking reimbursement.
- Educate yourself regarding any tax liability related to summer employment. Program participants are considered self-employed and are not officially employees of any university or the National Institute on Drug Abuse.
- Provide a verbal or written summary of your accomplishments during the summer experience to NIDA (details to follow).

### Application Procedures:

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

### Application components include:

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

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

All application materials must be submitted by **11:59 pm EST, Monday, February 2, 2024.**

### Application Review and Selection:

Interns are selected according to the following criteria:

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

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

### Contacts:

Feel free to contact Julie Huffman, [julie.huffman@nih.gov](mailto:julie.huffman@nih.gov), phone 301-443-9798; or Isabela Ellenwood, [Isabela.Ellenwood@nih.gov](mailto:Isabela.Ellenwood@nih.gov).

### 2024 NIDA Summer Research Internship Program Site List by State

State	Research Institution	Project Title	Research Site Number	Housing Availability
Alabama	Auburn University	In Vitro Assessment of Kratom Pharmacokinetic CYP Interactions with HIV ART Drug Metabolism	1	Off-Campus
Arizona	Arizona State University	Substance use HeAlth REcord Sharing	2	On-Campus
Arizona	University of Arizona	Evaluating Social Connectedness to Support Recovery from Opioid Use Disorder During the Postpartum Period	3	On-Campus
Arizona	University of Arizona	Evaluating Social Connectedness to Support Recovery from Opioid Use Disorder During the Postpartum Period	4	Off-Campus
California	Charles R. Drew University	The Next Generation Substance Abuse Research Training at Charles R. Drew University (CDU) and UCLA (NGSART-CU)	5	Off-Campus
California	Loma Linda University School of Medicine	Genomic and Epigenomic Mechanisms of Maternal E-Cigarette Induced Abnormal Brain Development	6	On-Campus
California	RAND Corporation	Comparing Two Federal Financing Strategies on Treatment Penetration and Sustainment	7	Off-Campus
California	San Diego Biomedical Research Institute	Methamphetamine, HIV Integration and Latency in the Brain	8	Off-Campus
California	Stanford University	Thalamic Circuits Underlying Opioid Seeking	9	On-Campus
California	Stanford University	Spatiotemporal Signaling and Trafficking of The Mu-Opioid Receptor	10	Off-Campus
California	Stanford University, School of Medicine	Research and Mentoring in Innovative Patient Oriented Pain and Opioid Science	11	Off-Campus
California	University of California San Diego	The Healthy Brain & Child Development National Consortium	12	On-Campus
California	University of California San Diego	Single-Cell Resolution Analysis of Chromatin Accessibility and Gene Expression Changes in a Model of Drug Addiction	13	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
California	University of California, Irvine	Cannabinoid Modulation of Central and Peripheral Extracellular Vesicles	14	Off-Campus
California	University of California, Irvine	Ventral Pallidum Circuits Underlying Preclinical Models of Opioid Addiction	15	Off-Campus
California	University of California, Irvine	The Lipid Hydrolase NAAA as a Target for Non-Addictive Analgesic Medications	16	On-Campus
California	University of California, Irvine	Effects of Early Life Adversity on Substance Use Problems in Adolescents: Biobehavioral Risk Mechanisms	17	Off-Campus
California	University of California, Los Angeles	mHealth to Enhance & Sustain Drug Use Reduction of the QUIT BI in Primary Care (QUIT-Mobile)	18	Off-Campus
California	University of California, San Francisco	Role of Endocannabinoid Signaling in a Preference/Aversion Circuitry	19	Off-Campus
California	University of Southern California	Hepatotoxic Mechanisms of Anti-HIV- and Anti-COVID-19 Drugs and Substance Use Disorders	20	Off-Campus
California	University of Southern California	Combined Mechanistic and Input-Output Modeling of the Hippocampus During Spatial Navigation	21	Off-Campus
Colorado	University of Colorado	Improving Pain Management and Opioid Safety Through a Systemwide, Data Driven Evaluation of the CDC Opioid Prescribing Guideline Best Practices and the Use of Clinical Decision Support	22	Off-Campus
Colorado	University of Colorado Anschutz	Novel Approaches to Assessing Cannabis Impaired Driving	23	Off-Campus
Colorado	University of Colorado Boulder	ERP Studies of Acute Influences of THC and CBD on Memory Encoding and Retrieval Processes	24	Off-Campus
Colorado	University of Colorado Boulder	Exploring the Anti-Inflammatory Properties of Cannabis and Their Relevance to Insulin Sensitivity	25	Off-Campus
Connecticut	University of Connecticut	Training in MHealth Prevention with MSM	26	Off-Campus
Connecticut	University of Connecticut	Collaborative Hub for Emerging Adult Recovery Research (CHEARR)	27	Off-Campus
Connecticut	Yale University	Reducing Stigma in People Who Inject Drugs with HIV Using a Rapid Start Antiretroviral Therapy Intervention	28	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Connecticut	Yale University	Evaluating the Potential Impact of a Menthol Ban in Cigarettes and E-Cigarettes Among Current Menthol Smokers	29	On-Campus
Connecticut	Yale University	Integrated eHealth for HIV and Substance Use Disorders in Justice-Involved Women	30	Off-Campus
Connecticut	Yale University	Deciphering the Single-Nucleus Genomic Regulatory Structure of Opioid Use Disorder in the Human Brain	31	On-Campus
Connecticut	Yale University	Integrating Community Based Participatory Research and Machine Learning Methods to Predict Youth Substance Use Disorders for Urban Cities in New Jersey	32	Off-Campus
Florida	Florida International University	Optimizing Prep Adherence in Sexual Minority Men Who Use Stimulants	33	Off-Campus
Florida	University of Florida	National Drug Early Warning System Coordinating Center	34	On-Campus
Florida	University of Florida	Opioid and Cannabinoid Interactions in Pain and Reward	35	Off-Campus
Georgia	Emory University / Georgia Tech	Robust Modeling of Within- and Across-Area Population Dynamics Using Recurrent Neural Networks	36	Off-Campus
Georgia	Georgia State University	Sex Differences in Stress Inoculation of Addiction-Like Phenotypes	37	Off-Campus
Georgia	Mercer University	Norepinephrine Modulates Medial Prefrontal Cortex Neural Ensembles that Control Cocaine Seeking Behavior	38	On-Campus
Georgia	University of Georgia	A Neuroecological Approach to Examining the Effects of Early Life Adversity on Adolescent Drug Use Vulnerabilities Using the ABCD Dataset	39	On-Campus
Illinois	Northwestern University	Improving Outcomes of Adolescent in Residential Substance Use Treatment via a Technology-Assisted Parenting Intervention	40	Off-Campus
Illinois	Northwestern University	Network Canvas 2.0: Enhancing Network Data Capture for Drug Use and HIV Research	41	Off-Campus
Illinois	Northwestern University	Development and Preliminary Testing of an Adjunct Smartphone App to Reduce Marijuana Use in Court-Involved, Non-Incarcerated Adolescents	42	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Illinois	Northwestern University	Leveraging Data Synthesis to Identify Optimal and Robust Strategies for HIV Elimination Among Substance-Using MSM	43	Off-Campus
Illinois	Northwestern University	Pilot Implementation of Measurement-Based Care in Community Opioid Treatment Programs	44	Off-Campus
Illinois	University of Chicago Medicine	Achieving Equity in Patient Outcome Reporting for Timely Assessments of Life with HIV and Substance Use (ePORTAL HIV-S)	45	Off-Campus
Indiana	Purdue University	User-Centric Development of Closed-Loop Therapy for Opioid Overdose	46	On-Campus
Kansas	University of Kansas	Neuronal Circuits and Molecular Mechanisms Underlying Early Social Isolation-Potentiated Heroin Seeking	47	Off-Campus
Kentucky	Northern Kentucky University	Executive Function in Opioid-Exposed Offspring and Subsequent Molecular Signatures	48	On-Campus
Kentucky	Northern Kentucky University	Contribution Of BLA-mPFC Pathway to Risky Choice and Compulsive Cocaine Seeking	49	On-Campus
Kentucky	University of Kentucky	Neurobehavioral Mechanisms Underlying Xylazine and Fentanyl Co-Use and Withdrawal	50	On-Campus
Kentucky	University of Kentucky	POPI: Placenta, Opioids and Perinatal Implications	51	On-Campus
Kentucky	US WorldMeds	Accelerated Development of Lofexidine for Neonatal Opioid Withdrawal Syndrome	52	On-Campus
Louisiana	Louisiana State University	Targeting Phospholipase C and Dendritic Spines to Reduce Cocaine and Heroin Motivation	53	On-Campus
Louisiana	Louisiana State University	Ecological Momentary Assessment of Racial/Ethnic Microaggressions and Cannabis Use Among Black Adults	54	Off-Campus
Massachusetts	Boston Medical Center	PrEP and MOUD Rapid Access for Persons who Inject Drugs: the CHORUS+ Study	55	Off-Campus
Massachusetts	Boston Medical Center	Health Economics of Substance Use Disorder, HCV, and HIV Treatment: Evaluating Intervention Outcomes for Individuals, Systems, and Communities	56	Off-Campus
Massachusetts	Brandeis University	Examining Opioid Use Disorder Treatment in Medicaid Managed Care Plans: Policies and Outcomes	57	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Massachusetts	Brigham and Women's Hospital	Smart Steps: A Context-Aware Adherence Intervention to Improve PrEP Adherence Among Men Who Have Sex With Men (MSM) with Substance Use Disorder	58	Off-Campus
Massachusetts	Brigham and Women's Hospital	Elucidating Mechanisms of Pregnancy's Protective Effect on Drug Abuse Using Integrated Data Analysis	59	Off-Campus
Massachusetts	Brigham and Women's Hospital	Impact of Prescription Stimulants on the Drug Overdose Epidemic	60	On-Campus
Massachusetts	Brigham and Women's Hospital	Oral Buprenorphine as a Novel Low-Dose Induction Strategy	61	Off-Campus
Massachusetts	Massachusetts General Hospital	Planning Grant for a Multi-Site Trial to Examine the Effectiveness of Recovery Community Centers Serving Black Communities to Support Persons Using Medications for Opioid Use Disorder	62	Off-Campus
Massachusetts	Massachusetts Institute of Technology	Defining the Impact of Drug Use on Immune Function and Fitness Against HIV-1	63	Off-Campus
Massachusetts	McLean Hospital / Harvard Medical School	Improving Treatment Engagement in Individuals with Co-Occurring Substance Use and Psychosis: A Telemedicine Family-Based Approach	64	Off-Campus
Massachusetts	McLean Hospital / Harvard Medical School	The Role of Behavior Therapy Combined with Buprenorphine for Opioid Use Disorder	65	Off-Campus
Massachusetts	Northeastern University	A Reduced Complexity Cross In BALB/c Substrains to Identify the Genetic Basis of Oxycodone Dependence Phenotypes	66	On-Campus
Massachusetts	Ragon Institute of Mass General, MIT, and Harvard	Harnessing Highly Networked HLA-E Epitopes to Achieve a Broadly Effective HIV Cure	67	Off-Campus
Maryland	Johns Hopkins University	Ending the HIV Epidemic: Peer-Supported Collaborative Care for Mental Health and Substance Use Disorder Care Integration into HIV Care Settings	68	Off-Campus



State	Research Institution	Project Title	Research Site Number	Housing Availability
Maryland	Maryland Treatment Centers	Peer Recovery Support Services for Individuals in Recovery Residences on MOUD	69	Off-Campus
Maryland	University of Maryland/VA Maryland Healthcare System	PTPRD Phosphatase Inhibitors for Stimulant Use Disorders	70	Off-Campus
Maryland	University of Maryland, Baltimore	Dopamine Circuit Regulation of Morphine Reinforcement Across the Opioid Exposure Cycle	71	Off-Campus
Maryland	University of Maryland, College Park	16/24 Healthy Brain and Child Development National Consortium	72	Off-Campus
Maryland	University of Maryland, College Park	Stepped Care, Peer-Delivered Intervention to Improve ART Adherence and SUD in Primary Care	73	Off-Campus
Michigan	Henry Ford Health	Improving Decision Making to Prevent Substance Misuse among Adolescents from Traditionally Underserved Communities	74	Off-Campus
Michigan	University of Michigan	Probing the Role of a Hypothalamic-Thalamic-Striatal Circuit in Cue-Driven Behaviors	75	Off-Campus
Michigan	University of Michigan, School of Public Health	The Impact of Surgery on Outcomes for Patients Taking Medications for Opioid Use Disorder	76	On-Campus
Michigan	Wayne State University	The Effects of Gestational Opioid Exposure on the Maternal Brain, Behavior, and Microbiome	77	On-Campus
Michigan	Wayne State University	Enhancing the Impact of Evidence-Based Prevention for Youth: The Rapid Adaptation to Prevent Drug Use (RAPD) Implementation Strategy	78	On-Campus
Minnesota	University of Minnesota	Endogenous Opioid Dysfunction, Stress, and Risk for Smoking Relapse	79	On-Campus
Minnesota	University of Minnesota	Characterization of a Novel Spinal Astrocyte-Neuron Signaling System in Chronic Pain	80	Off-Campus
Minnesota	University of Minnesota	Glutamatergic Plasticity That Drives Cannabinoid Withdrawal and Craving	81	Off-Campus
Minnesota	Washington University in Saint Louis	Cannabis, HIV and Mental Processing Systems (CHAMPS)	82	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
North Carolina	Duke University	Increasing the Health Equity and Population-Level Impact of a Digital Therapeutic for Smokers with Psychiatric Illness	83	On-Campus
North Carolina	University of North Carolina at Chapel Hill	Developmental Pathophysiology of Adverse Patterns of Substance Use in Adolescents with Anxiety	84	On-Campus
North Carolina	University of North Carolina at Chapel Hill	Promoting Collaborative Research on Human Connectome Analysis for Substance Use Disorders	85	On-Campus
North Carolina	Wake Forest School of Medicine	Cocaine Self-Administration and Cholesterol Metabolism	86	Off-Campus
Nebraska	University of Nebraska Medical Center	Single Cell Determinants of Brain in the Context of Viral Persistence in SIV/cART/Cocaine Non-Human Primates	87	Off-Campus
New Hampshire	Pirouette Medical Inc	A Rugged, Reliable, Portable, Safe, and Simple Naloxone HCl Auto-Injector for Life-Saving Treatment of Opioid Overdose	88	Off-Campus
New Jersey	Enalare Therapeutics Inc.	Development of Medication for the Treatment of Respiratory Depression Due to Opioid (Prescribed or Illicit) Overdose/Multidrug (Polysubstance) Overdose in a Hospital or Community Setting	89	Off-Campus
New Jersey	Princeton University	Multiscale Computational Frameworks for Integrating Large-Scale Cortical Dynamics, Connectivity, and Behavior	90	Off-Campus
New Jersey	Rutgers University	Recovery of Reward Function in Nicotine Use Disorder Using a Combination of Robotics, Electrophysiology, and TMS	91	Off-Campus
New Jersey	Zena Therapeutics, Inc.	Development of Compound RUEC2-118, a Novel Partial GABAAR Positive Modulator, a Fast-Acting Treatment for General Anxiety and Panic Disorder, to Prevent Opioid and Benzodiazepine Overdose Fatalities	92	Off-Campus
New York	Albert Einstein College of Medicine	Computational Tools for Assessing Mechanisms and Functional Relevance of Divisive Normalization	93	Off-Campus
New York	New York University School of Medicine	Implementation of Overdose Prevention Practices in Permanent Supportive Housing	94	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
New York	New York University School of Medicine	Person-Centered Quality Measurement and Management in a System for Addictions Treatment In New York State	95	Off-Campus
New York	New York University Langone Medical Center	New Psychoactive Substance Exposure Among NYC Nightclub and Festival Attendees	96	On-Campus
New York	New York University School of Medicine	Development of a Novel Polysubstance Assessment Tool for Vulnerable Subpopulations	97	On-Campus
New York	New York University School of Medicine	SOAR: Smartphones for Opiate Addiction Recovery	98	On-Campus
New York	Partnership to End Addiction	Family-based Recovery Support Service Network for Youth OUD	99	Off-Campus
New York	Queens College & Graduate Center, CUNY	Epigenetic Susceptibility of Behavior & Addictive Disorders During Pre/Pubescence After Natural Disaster Exposures in Utero	100	Off-Campus
New York	Stony Brook University	Opioids and Maternal Brain-Behavior Adaptation During the Early Postpartum	101	On-Campus
New York	University of Buffalo	KATP Channels as Downstream Targets of Adenylyl Cyclases During Opioid Tolerance and Withdrawal	102	Off-Campus
New York	University of Buffalo	The Role of the Bed Nucleus of the Stria Terminalis-Norepinephrine System in Amphetamine-Type Stimulant Use Disorders	103	Off-Campus
New York	Weill Cornell Medicine	Leveraging Regulatory Flexibility for Methadone Take-Home Dosing to Improve Retention in Treatment for Opioid Use Disorder: a Stepped-Wedge Randomized Trial to Facilitate Clinic Level Changes	104	Off-Campus
New York	Weill Cornell Medicine	Expansion of Mail-Delivered Harm Reduction Services in the U.S.	105	Off-Campus
New York	Weill Cornell Medicine	The Economic Viability and Value of Implementing an Inpatient Addiction Consult Model in Public Hospital Systems for Patients with Opioid Use Disorder	106	Off-Campus
New York	Weill Cornell Medicine	Delivery of Addiction Treatment for Medicaid Enrollees with Serious Injection-Related Infections	107	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
New York	Weill Cornell Medicine	Intergenerational Effects of America's Opioid Crisis: Parental Drug Use and Offspring Health	108	Off-Campus
New York	Weill Cornell Medicine	Comparative- And Cost-Effectiveness Research Determining the Optimal Intervention for Advancing Transgender Women Living with HIV to Full Viral Suppression	109	Off-Campus
New York	Weill Cornell Medicine	Health Economics of Substance Use Disorder, HCV, and HIV Treatment: Evaluating Intervention Outcomes for Individuals, Systems, and Communities	110	Off-Campus
Ohio	Case Western Reserve University	CWRU Center for Excellence on the Impact of Substance Use on HIV	111	On-Campus
Ohio	Nationwide Children's Hospital	Evaluating the Impact of Fentanyl Test Strip Use Among Rural and Urban Populations	112	Off-Campus
Ohio	University of Cincinnati College of Medicine	Omics Analysis of HIV During Synthetic Opioid Exposure	113	On-Campus
Oklahoma	Laureate Institute for Brain Research	Kipiyecipakiciipe "Coming Home": Establishing Clinical Cultural Neuroscience as a Tool for Understanding the Role of Traditional Cultural Engagement in Mitigating Substance Misuse and Disorder	114	Off-Campus
Oregon	Chestnut Health Systems' Lighthouse Institute	Building a Lasting Foundation to Advance Actionable Research on Recovery Support Services for High-risk Individuals with Opioid Use Disorder: The Initiative for Justice and Emerging Adult Populations (The JEAP Initiative)	115	Off-Campus
Pennsylvania	Behavior, LLC	Modeling Physiology and Behavior of Veterans to Avert Opioid Related Mortality Through Timely Intervention	116	Off-Campus
Pennsylvania	Temple University	HIV, Methamphetamine and Human iPSC-Derived Microglia-containing Cerebral Organoids	117	On-Campus
Pennsylvania	The Penn State College of Medicine	Circuit-Specific Molecular Mechanisms in Fentanyl Use and Relapse	118	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Pennsylvania	The Pennsylvania State University	Building the Science of Improving Evidence Informed Prevention Policy	119	Off-Campus
Pennsylvania	Thomas Jefferson University	Characterization of Cocaine Induced Signaling Pathways That Enhances HIV Transcription	120	On-Campus
Pennsylvania	University of Pennsylvania	Pregabalin Plus Lofexidine for the' Outpatient Treatment of Opioid Withdrawal	121	On-Campus
Pennsylvania	University of Pennsylvania	Genetically Targeted Photo-Pharmacology for Native Opioid Receptors	122	Off-Campus
Pennsylvania	University of Pittsburgh	HEALing Measurement Center: Enhancing Opioid Use Disorder Recovery Through Measurement Based Care	123	On-Campus
Pennsylvania	University of Pittsburgh	Machine-Learning Prediction and Reducing Overdoses with EHR Nudges (mPROVEN)	124	On-Campus
Pennsylvania	University of Pittsburgh School of Medicine	Collaborative Care for Polysubstance Use in Primary Care Settings (Co-Care)	125	On-Campus
Pennsylvania	University of Pittsburgh School of Medicine	Technology Enhanced Substance Use and HIV Service Navigation for Justice-Involved Young Adults	126	On-Campus
Rhode Island	Brown University	Injectable Extended-Release Buprenorphine (XR-B) in a Correctional Setting: a Pilot Randomized Controlled Trial	127	Off-Campus
Rhode Island	Brown University	Prenatal Tobacco Exposure: Self-Regulatory Pathways to Externalizing Behaviors	128	On-Campus
Rhode Island	Brown University	a Multiple Health Behavior Change Intervention for Overweight and Obese Smokers	129	On-Campus
Rhode Island	Brown University	Using Implementation Interventions and Peer Recovery Support to Improve Opioid Treatment Outcomes in Community Supervision	130	Off-Campus
Rhode Island	The Miriam Hospital	Placental Genomics in the Developmental Consequences of Marijuana Use in Pregnancy	131	Off-Campus
South Carolina	Medical University of South Carolina	Gender and Sex Hormone Influences on Cannabis Use Disorder Remission	132	Off-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Tennessee	University of Tennessee Health Science Center	Pangenomics of Nicotine Abuse in The Hybrid Rat Diversity Panel	133	Off-Campus
Tennessee	University of Tennessee Health Science Center	Opposing Contributions of Oxytocin and Corticotropin-Release Factor to Alcohol Dependence	134	Off-Campus
Texas	Baylor College of Medicine	Functional Connectivity Alterations Among Opioid Users in Treatment	135	Off-Campus
Texas	The University of Texas at Dallas	Vagus Nerve Stimulation Modulates Synaptic Plasticity in the Rat Prefrontal Cortex during the Extinction of Drug-Seeking	136	On-Campus
Texas	The University of Texas at El Paso	Preventative Biomarkers and Potential Pharmacotherapies for Nicotine Use and Diabetes	137	On-Campus
Texas	The University of Texas at San Antonio	Advancing Brain Health Research Through Male Germline Editing in Marmosets	138	Off-Campus
Texas	University of Texas	Randomized Trial of a Data-Driven Technical Assistance System for Drug Prevention Coalitions	139	On-Campus
Texas	University of Texas Health Science Center at Houston	Identifying Electrophysiological Targets for Transcranial Magnetic Stimulation in Cocaine Use Disorder	140	Off-Campus
Texas	University of Texas Medical Branch	NOP Receptor Antagonist for OUD Pharmacotherapy	141	Off-Campus
Virginia	Virginia Commonwealth University	20/21 ABCD-USA Consortium: Research Project Site at VCU	142	Off-Campus
Virginia	Virginia Commonwealth University	Genetics Basis of Nicotine Withdrawal in A Reduced Complexity Cross-NCE	143	Off-Campus
Virginia	Virginia Commonwealth University	Cell Type Transcriptional Mechanisms of Polysubstance Choice	144	On-Campus

State	Research Institution	Project Title	Research Site Number	Housing Availability
Virginia	Virginia Commonwealth University	HIV, Methamphetamine and Human iPSC-Derived Microglia-Containing Cerebral Organoids	145	Off-Campus
Washington	University of Washington	Effects of Direct and Vicarious Discrimination on Alcohol and Cannabis Cravings: Virtual Reality Experiment	146	On-Campus
Washington	University of Washington	Vaccines for Fentanyl	147	Off-Campus
Washington	University of Washington	Clinical Trials Network: Pacific Northwest Node	148	On-Campus
Washington	University of Washington, Seattle	Dissecting Dynorphin-Kappa Opioid Mediated Reinstatement of Nicotine Preference	149	On-Campus
Wisconsin	Medical College of Wisconsin	Mechanisms Underlying the Influence of Stress on Drug-Seeking Behavior	150	On-Campus
Wisconsin	University of Wisconsin-Madison	Testing a Video and Text Messaging Intervention to Reduce PTSD and Opioid Misuse Among Sexual Violence Survivors	151	On-Campus
West Virginia	West Virginia University	Chemical Synthesis of Illudalic Acid Analogs for Stimulant Use Disorder	152	On-Campus

# Alabama

Investigator: Angela I. Calderon, Ph.D.  
Institution: Auburn University  
Auburn, AL  
Project Title: In Vitro Assessment of Kratom Pharmacokinetic CYP Interactions with HIV ART Drug Metabolism  
Research: Basic Research  
Research Area: Kratom Use, HIV/AIDS, Psychoactive & Opioid Properties, HIV ART Drugs Mediated by CYPs, Plasma Proteins  
Earliest Start Date: June 3, 2024  
Housing: Off Campus

**Student Qualifications:** Undergraduate student with major in Chemistry/Biochemistry. Previous lab experience. Proficient in scientific reading and writing. Career interests in Ph.D. in Pharmaceutical Sciences/Medicinal Chemistry. Students will be using human plasma in the experiments.

**Project Description: Determining** human serum protein binding of kratom alkaloids. Since displacement of HIV ART drugs from plasma proteins (such as human serum albumin) can be another cause of kratom-drug interactions, the extent of plasma protein binding of mitragynine and all other major kratom alkaloids will be determined. As we reported previously, rapid equilibrium dialysis and LC-MS/MS will measure the binding of each kratom alkaloid at concentrations clinically relevant to human plasma proteins from pooled donors. For comparison, serum protein binding of HIV ART drugs at average steady-state concentration will also be determined. Briefly, 200  $\mu\text{L}$  of each test compound (10  $\mu\text{M}$ ) in pooled human plasma will be added to a rapid equilibrium dialysis device and placed in PBS at 37°C with orbital shaking. After equilibrium is achieved, aliquots will be removed from the buffer and plasma chamber, and test-compound concentrations will be determined after protein precipitation and extraction using LC-MS/MS. The corresponding data analysis will be performed.

The undergraduate student will evaluate how kratom alkaloids affect the binding of HIV ART drugs and human plasma protein binding. The human plasma protein binding will be a parameter that can be used to study the mechanism of botanical Drug Interactions.



# Arizona

Investigator: Maria Adela Grando, PhD  
 Institution: Arizona State University  
 Phoenix, AZ  
 Project Title: Substance use HeAlth REcord Sharing  
 Research: Other Research  
 Research Area: Patient Surveys, Survey Data Analysis, Spanish and English  
 Earliest Start Date: May 15, 2024  
 Housing: On Campus

**Student Qualifications:** The student will be working with survey data and/or humans. All the required human subject protection training will be provided. Individuals with career interests in healthcare, medicine, social sciences, technology, and informatics could be a good fit for this opportunity. Speaking fluent Spanish is a desirable, but not an exclusive qualification.

**Project Description:** Conduct patient confidential electronic surveys to assess views on SUD (substance use disorder) protections.

**Hypothesis:** Spanish and English-speaking patients differ in their SUD data sensitivity views and willingness to share SUD medical records.

**Sample and recruitment:** Given that stigma may impact individuals receiving SUD treatment, confidential electronic surveys are completed to avoid selection bias. Based on our previous experience, the estimated number (20.8% in 2010) of Spanish speakers in Arizona and study sites' patient demographics, adult English speaking (n=200) and Spanish speaking (n=100) patients are recruited. Recruitment takes place in (n=5) participating clinical study sites (three integrated clinics, a health system, and an SUD treatment clinic) caring for adult patients. Printed flyers explaining the study are distributed at the facilities. Similar to Kim et al. research, study recruiters are available at the study sites to invite participation, explain the study, assess patient eligibility and collect informed consent.

**Eligibility criteria:** Patients at the study sites who are 18 years old or older, Spanish, or English speakers.

**Informed consent:** In the presence of the recruiter the patient completes the informed consent and provides an email address to receive the electronic survey.

**Survey design:** The goal is to validate the hypothesis. The survey includes questions on:

- 1) self-report demographics (including age, education, income, and SUD diagnosis)
- 2) perceived sensitivity of SUD medical record information

- 3) willingness to share SUD data depending on data recipient (e.g., health providers within or outside the facility) and data sharing purpose (patient's own care and research)
- 4) relationship between willingness to share SUD data and quality of care, perceived stigmatization, length of pre-existing patient-provider relationship (an indicative of trust) with the data recipient

**Spanish translations:** The survey and recruitment materials are in English and Spanish. Dr. Grando is a native Spanish speaker and leads the translation. A second bilingual Spanish and English speaker outside the research team completes back translations to enhance accuracy. The Spanish translation of the survey is pilot-tested with 15 Spanish-speaking patients.

**Survey delivery:** After consent, the participant receives a link to access the structured Spanish or English electronic survey (supported by Qualtrics software). The survey takes about 20 minutes.

# Arizona

**Investigator:** Alicia Allen, PhD, MPH  
**Institution:** University of Arizona  
Tucson, AZ  
**Project Title:** Evaluating Social Connectedness to Support Recovery from  
Opioid Use Disorder during the Postpartum Period  
**Research:** Clinical Research  
**Research Area:** Opioid Use Disorder, Pregnancy, Postpartum Period, Mixed  
Methods  
**Earliest Start Date:** May 1, 2024  
**Housing:** On Campus

**Student Qualifications:** Qualifications include: (a) health-related major, (b) interested in public health or related field, (c) experience working with PC computer programs (such as Word and Excel), and (d) comfortable and effective working independently and as part of a team. This research will require students to work directly with humans.

**Project Description:** The overall goal of this project is to understand the role of social connection, isolation, and/or loneliness in opioid use disorder (OUD)-related recovery outcomes during the postpartum period. To achieve this goal, this project will complete three phases. Phase one is a nation-wide anonymous survey for those with OUD who are either currently pregnant or have had a baby within the past three months. In phase two, a subset of those who completed phase one will complete a one-on-one interview. This interview will include open-ended questions about what and who is (or is not) supportive, as well as a personal network analysis. Lastly, in phase three, a subset of those who completed phase two will complete a prospective following. During this time participants will complete a photovoice protocol and a secondary interview. The photovoice protocol includes taking pictures of things that are supportive or challenging, as well as responding to pictures taken by others in the study. The secondary interview will examine how personal networks have changed over time. These data will inform the creation of new or augmentation of existing interventions to directly address social connection, isolation, and/or loneliness in people with OUD during the perinatal period.

# Arizona

Investigator: Linnea Linde-Krieger, PhD  
 Institution: University of Arizona  
 Tucson, AZ  
 Project Title: Evaluating Social Connectedness to Support Recovery from  
 Opioid Use Disorder during the Postpartum Period  
 Research: Behavioral Research  
 Research Area: Addiction, Opioid Use Disorder, Relapse Prevention, Pregnancy  
 and Postpartum, Loneliness/Social Connection  
 Earliest Start Date: June 3, 2024  
 Housing: Off Campus

**Student Qualifications:** Knowledge or research experience with substance use/addictions, pregnancy, maternal and child health, and/or psychosocial stress is preferred. A variety of majors and career interests are relevant to this project, including but not limited to, psychology, medicine, social work, epidemiology, public health, and data science/statistics. This research will require interns to work with human subjects' data (quantitative and qualitative) and may include data collection with human subjects depending on the experience and interest of the intern(s). Familiarity with data management and basic statistical analysis is preferred. Interns should have strong communication skills and the ability to work successfully on a diverse and fast paced team.

**Project Description:** The prevalence of opioid use disorder (OUD) during pregnancy has increased by nearly 500% over the past 15 years. While motivation for and compliance with OUD treatment during pregnancy is heightened, up to 80% of postpartum individuals with OUD relapse to illicit opioid use within six months of childbirth. A growing body of evidence indicates that, in the general population, positive social connectedness and strong social bonds are associated with improved OUD recovery outcomes (e.g., reduced craving, lower risk of relapse). Conversely, loneliness and social isolation are significant predictors of opioid misuse and relapse, particularly for women. Loneliness increases during transitional periods including from pregnancy to postpartum, signaling increased risk for adverse recovery outcomes. Moreover, relapse risk during the fourth trimester (i.e., the time from delivery to postpartum week 12) may be compounded by unique postpartum stressors, including postpartum depression and anxiety, sleep disturbances, heightened need for pain management, and caregiving-specific stress.

The overall goal of this NIH-funded research project is to understand the role of social connectedness in mothers' OUD-related recovery outcomes, specifically during the postpartum fourth trimester, an ideal inflection points with untapped potential. The project has three primary aims. The first two aims will utilize data from 50 participants with OUD and 25 control participants who were followed from pregnancy through five months postpartum. Ecological momentary assessments (EMA) paired with medical record data will be used to assess social connectedness and OUD-related recovery outcomes. Analyses will evaluate

differing theoretical models of social connectedness in this population by testing the main and stress-buffering effects of social connectedness on recovery outcomes up to one year postpartum (Aim 1). Additionally, techniques from data science and machine learning will characterize dynamic changes in social connectedness across the fourth trimester and evaluate how patterns/changes relate to mothers' recovery outcomes (Aim 2). Lastly, key informant interviews with 30 participants from the target population will be analyzed qualitatively to explore the feasibility, acceptability, and opportunities for intervention to enhance social connectedness to improve the treatment of OUD and prevent postpartum relapse (Aim 3).

The results of this study, regardless of outcome, will directly contribute to scientific knowledge on the role of social connectedness in postpartum OUD recovery. Moreover, this work will allow for the identification of new intervention targets, which will contribute to the development of novel, high-impact relapse prevention treatments tailored to the fourth trimester, a unique inflection point with ample untapped opportunity. This will be directly impactful to the 80,000 - 120,000 women, infants, and families who suffer the consequences of perinatal OUD every year.

## California

**Investigator:** Theodore Friedman, MD, PhD  
**Institution:** Charles R. Drew University  
Los Angeles, CA  
**Project Title:** The Next Generation Substance Abuse Research Training at Charles R. Drew University (CDU) and UCLA (NGSART-CU)  
**Research:** Basic Research  
**Research Area:** E-Cigarettes, Nicotine, Smoking  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The following skills are preferred:

- Molecular Biology skills
- Animal handling skills
- Computer skills (Excel, Word, and PowerPoint)

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

**Project Description:** Charles R. Drew University and UCLA are the sites of The Next Generation Substance Abuse Research Training at Charles R. Drew University (CDU) and UCLA (NGSART-CU). Dr. Theodore Friedman is the Program Director, and the goals of this grant are to train the next generation of substance abuse researchers. Most of our research is on the endocrine effects of drugs of abuse. We are intrigued by the clinical condition that smokers are lean, yet have more cardiovascular disease, insulin resistance and diabetes. We are using mouse models to understand this paradox and have found that nicotine plus a high fat diet leads to weight loss and reduced abdominal fat, yet ectopic fat depositions in liver and muscle. We are also looking at how nicotine plus soft drinks leads to hepatic steatosis. We have recently found that electronic cigarettes lead to atherosclerosis, heart failure and fatty liver disease in mice and most of our current studies use e-cigarettes. Additional opportunities exist for clinical projects, literature review projects and epidemiology projects related to drug addiction. All experiments are well suited for student involvement and will introduce them to major techniques in substance abuse research.

Housing is available at nearby California State University-Dominguez Hills and USC. Students will be given the opportunity to present at our annual Drew Substance Abuse Research Day.

# California

Investigator: Charles Wang, PhD, MPH  
 Institution: Loma Linda University School of Medicine  
 Loma Linda, CA  
 Project Title: Genomic and Epigenomic Mechanisms of Maternal E-Cigarette induced Abnormal Brain Development  
 Research: Basic Research  
 Research Area: Electronic Cigarette Smoking, Nicotine, Maternal Exposure, Genomics & Epigenomics Mechanism, Abnormal Brain Development, Single-Cell Sequencing, Spatial Transcriptomics, Bioinformatics  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** We prefer the following:

1. Must be majored in computational biology, genomics, bioinformatics
2. Knowing some bioinformatics tools with coding skills, such as R language, knowing Python will be a plus.
3. The intern will not conduct wet lab experiments, but will be focusing on the genomics data analysis, thus no animal or human subject contact.
4. The intern has a career interest in genomics, bioinformatics, and computational biology.

**Project Description:** Maternal smoking is a well-recognized public health concern associated with increased neurodevelopmental disorders and other health risks in offspring. Substantial evidence indicates various adverse effects of maternal smoking or prenatal nicotine exposure on neonatal brain development, e.g., hyperactivity, reduced cognitive performance, increased anxiety and depression, and increased susceptibility to brain injury. Electronic cigarettes (e-cig) have become popular in pregnant women and young adolescents. Growing evidence suggests that maternal e-cig use affects brain development, resulting in abnormal cortical neuronal morphology and aberrant neuro-behaviors in offspring. Using a rat prenatal e-cig exposure model and single-nucleus sequencing, we recently found that prenatal e-cig exposure disrupted excitatory-inhibitory (E/I) balance, ratio of excitatory/ inhibitory neurons, in the neonatal brain. E/I balance is crucial for normal brain development and functions, and its disruption has been postulated to underlie the pathogenesis of many neurodevelopmental disorders, including autism spectrum disorders, ADHD, and other psychiatric disorders. However, the underlying genomic and epigenomic mechanisms are still not known. This investigation seeks to fill this knowledge gap. Exploiting the prenatal e-cig exposure model we developed recently, the propose aims to determine the spatial-temporal effects of prenatal e-cig exposure on brain development and progression of E/I imbalance using spatial genomics and single-cell sequencing techniques and to understand the genomic and epigenomic mechanisms regulating the prenatal e-cig induced E/I imbalance. Many cutting-edge genomic and epigenomic technologies are exploited in the studies, including spatial

genomics, single-nucleus RNA-seq and chromatin accessibility (snATAC-seq), and state-of-the-art bioinformatics tools. A large amount of unprecedented omics data on the rat brain prenatally exposed to e-cig will be produced. IMPACT: Using a well-established intrauterine e-cig exposure model coupled with cutting-edge genomics and epigenomics approaches, the proposed studies will elucidate the genomic and epigenomic mechanisms underlying maternal e-cig induced abnormal brain development, providing valuable new insights into the effects of e-cig on the early central nervous system development, which will help explore promising molecular and cellular therapeutic targets for treating e-cig vaping-induced brain damage.



# California

Investigator: Alex R. Dopp, PhD  
 Institution: RAND Corporation  
 Santa Monica, CA  
 Project Title: Comparing Two Federal Financing Strategies on Treatment Penetration and Sustainment  
 Research: Behavioral Research  
 Research Area: Adolescent Substance Use, Substance Use Disorder, Treatment, Evidence-Based Practices, Behavioral Health Service Systems, Financing Strategies, Implementation, Sustainment, Public Finance, Policy  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** The research team is open to interns from a wide variety of backgrounds and skill levels. The most important qualification is that the intern has a strong interest in learning about substance use treatment services and systems (especially about efforts to improve those systems through evidence-based practice implementation) and openness to working with both quantitative data (including statistical analyses and programming languages like STATA or R) and qualitative data from interviews and focus groups (including use of analysis software like NVivo or Dedoose). This experience would be a good fit for interns interested in careers and/or graduate training in a variety of substance use/mental health fields (counseling, social work, psychology, psychiatry, etc.) as well as health policy fields. Applicants who have personal connection to substance use disorder – whether themselves, family, community, or otherwise – are welcomed on our team, which cultivates an open, supportive culture that explicitly addresses and resists stigma toward substance use.

**Project Description:** Rigorous research has shown that use of evidence-based practices can improve adolescent substance use disorder outcomes. However, effective strategies are needed to financially support the use of evidence-based practices in substance use service systems. This project aims to compare two grant-making strategies used by the U.S. Substance Abuse and Mental Health Services Administration on key implementation outcomes. Specifically, we are comparing organization-focused versus state-focused grants on their ability to achieve widespread adoption and sustained use of an evidence-based practice for substance use, the Adolescent Community Reinforcement Approach, in a large national sample over a 15-year implementation period. Results will provide critically needed information about the effects of different grant-making strategies in supporting widespread and long-term availability of evidence-based practices, which is necessary to achieving large-scale reductions in adolescent substance use disorders and their associated public health and societal impacts.

# California

**Investigator:** Maria Cecilia G. Marcondes, PhD  
**Institution:** San Diego Biomedical Research Institute  
San Diego, CA  
**Project Title:** Methamphetamine, HIV Integration and Latency in the Brain  
**Research:** Basic Research  
**Research Area:** Methamphetamine, Cannabis, NeuroHIV, Viral Integration, HIV Latency, Microglia, Inflammation, Blood Brain Barrier  
**Earliest Start Date:** June 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The student is expected to know basic concepts in immunology, but above all, have curiosity, the ability to study independently, and express science or medicine career goals.

**Project Description:** The summer intern will contribute to studies about the blood-brain barrier and the dysfunctions caused by substance use disorders, which underlie persistent neuroinflammatory processes leading to aggravated neurocognitive disorders in people living with HIV that use drugs. Our lab performs experiments on brain microvascular cells combined with cell types that contribute to the formation of a blood brain barrier, such as pericytes and astrocytes, using transwells and brain-on-a-chip technology, to respond questions on the role of substance use and HIV interactions in cerebrovascular disorders underlying neuroinflammation.

# California

Investigator: Xiaoke Chen, PhD  
Institution: Stanford University  
Stanford, CA  
Project Title: Thalamic Circuits Underlying Opioid Seeking  
Research: Basic Research  
Research Area: Opioid Withdrawal, Neural Circuits Dissection, Examining Circuitry  
Mechanism Underlying Opioid-Associated Memories  
Earliest Start Date: June 15, 2024  
Housing: On-Campus

**Student Qualifications:** Opioid withdrawal, neural circuits dissection, examining circuitry mechanism underlying opioid-associated memories.

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

# California

**Investigator:** Ruth Huttenhain, PhD  
**Institution:** Stanford University  
Stanford, CA  
**Project Title:** Spatiotemporal Signaling and Trafficking of The Mu-Opioid Receptor  
**Research:** Basic Research  
**Research Area:** Molecular Biology, Proteomics, Opioid Receptor, Protein Interactions  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Some experience with molecular or cellular biology would certainly be helpful, interest in basic science. The project will involve working with cells that we grow in tissue culture plates and depending on if there is interest/time it could involve the differentiation of induced pluripotent stem cells into neurons.

**Project Description:** Opioids are the most effective analgesics but are associated with severe side effects including respiratory depression, tolerance, and addiction. These factors helped cause the opioid abuse epidemic in the US, making drug overdose the leading cause of accidental death in the US. Thus, the identification of safer analgesics with diminished side effects and abuse potential is critical to address the ongoing crisis. Clinically used opioids predominantly exert both their analgesic and adverse effects through their action on the  $\mu$ -opioid receptor (MOR). While several approaches were taken towards safer analgesics, these efforts are limited by a lack of understanding of the complex biochemical networks engaged and activated by MOR in response to ligand binding. In this larger project, we are aiming to delineate the MOR-initiated signaling pathways for endogenous peptides and addictive opioids and how these are coordinated by receptor location. The overarching goal of this proposal is to combine quantitative proteomics, functional genomics, and opioid receptor biology to systematically discover and characterize regulators of MOR signaling and trafficking in human induced pluripotent stem cell-derived neurons. We will combine proximity labeling mass spectrometry and quantitative phosphoproteomics to systematically delineate interaction networks that MOR engages and map the signaling pathways it activates. To study the functional role of proteomic targets in MOR signaling and trafficking, we will develop and apply reporter assays for receptor signaling and trafficking in CRISPRi gene regulation screens. Finally, we will test mechanistic hypotheses from proteomic and genetic screens on how novel regulators of trafficking and signaling fine tune the cellular response of MOR activation. Our proposed approach will yield mechanistic insights into MOR-initiated signaling pathways and how these are regulated by receptor trafficking. Identifying key regulators of MOR activation will fill a critical gap for designing safer pathway selective analgesics and treatments for opioid addiction.

## California

**Investigator:** Beth Darnall, PhD  
**Institution:** Stanford University, School of Medicine  
Stanford, CA  
**Project Title:** Research and Mentoring in Innovative Patient Oriented Pain and Opioid Science  
**Research:** Clinical Research  
**Research Area:** Chronic Pain, Digital Health, Opioid Misuse, Online, Brief Behavioral Intervention  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interest in chronic pain, opioid misuse, and pain psychology are preferred. Prior work with patients is desired but not required.

**Project Description:** We have an active, national, virtual, randomized controlled trial of scalable digital behavioral pain treatment (Empowered Relief) for people with comorbid chronic pain and prescription opioid misuse, and are investigating impacts on pain and opioid outcomes. Additionally, we have national data from 1,350 patients taking prescription opioids (600 of whom were involved in voluntary opioid tapering) with opportunities to develop a project using existing data from this PCORI-funded project.

## California

Investigator: Gretchen Bandoli, PhD, MPH  
Institution: University of California San Diego  
La Jolla, CA  
Project Title: The Healthy Brain & Child Development National Consortium  
Research: Epidemiology Research  
Research Area: Substance Use During Pregnancy, Maternal Outcomes, Child Outcomes, Prenatal Exposures  
Earliest Start Date: July 1, 2024  
Housing: On-Campus

**Student Qualifications:** The student will be trained in the ethical conduct of research and how to conduct a literature search and summarize the findings. We prefer a candidate with a major in human health sciences (epidemiology, psychology, neuroscience), but are open to other majors as well. We also prioritize applicants with an interest in pregnancy or maternal/child health.

**Project Description:** The primary focus of the summer project will be to gain an appreciation for substance use disorders and substance use during pregnancy. This project will include hands-on training on how to conduct human subjects research with pregnant individuals and their offspring, as well as a separate project that will involve performing a literature search on the treatments available for substance use disorders, and the safety and efficacy of these treatments during pregnancy.

## California

**Investigator:** Francesca Telese, PhD  
**Institution:** University of California San Diego  
La Jolla, CA  
**Project Title:** Single-Cell Resolution Analysis of Chromatin Accessibility and Gene Expression Changes in a Model of Drug Addiction  
**Research:** Basic Research  
**Research Area:** Single Cell Genomics, Preclinical Model of Addiction, Epigenetics, Genetics, Enhancer  
**Earliest Start Date:** June 17, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Previous knowledge of bioinformatics and molecular biology is preferred. The project will involve working with bioinformatic data and/or tissue samples.

**Project Description:** Join our cutting-edge research aimed at understanding the biological underpinnings of opiate addiction. We're studying the cell-specific gene expression patterns predisposing individuals to oxycodone addiction. Our investigation centers on the nucleus accumbens, a crucial brain area for transitioning from moderate to excessive drug use. We have access to a rich single nuclei RNA-seq and ATAC-seq dataset from outbred rats vulnerable or resistant to oxycodone addiction. Engage in a multidisciplinary project poised to make groundbreaking contributions to understanding opioid addiction mechanisms.

## California

**Investigator:** Christie Fowler, PhD  
**Institution:** University of California, Irvine  
Irvine, CA  
**Project Title:** Cannabinoid Modulation of Central and Peripheral Extracellular Vesicles  
**Research:** Basic Research  
**Research Area:** Cannabinoid, THC, Marijuana, Cannabis, Nicotine, E-Cigarettes, Extracellular Vesicles, RNA, Vape, Sex Differences, Rat  
**Earliest Start Date:** June 17, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interns will be required to handle rodents and tissue samples. Preferred applicants will have a basic knowledge of neuroscience/biology with an interest in pursuing a research-related career (PhD). Students will be trained in all techniques to be performed in this research.

**Project Description:** Given the recent increase in cannabis use in the US, there is an urgent need to understand the effects of cannabinoids more clearly on central and peripheral signaling mechanisms. The main psychoactive component in cannabis,  $\Delta^9$ -tetrahydrocannabinol (THC), has been shown to act directly on the cannabinoid receptors. These receptors are expressed in both brain and peripheral cellular populations that have been shown to secrete extracellular vesicles, including the choroid plexus, neurons, glia, and fat cells. The main goals of this research are to investigate the effects of THC on extracellular vesicle signaling in the brain and blood and to identify a panel of biomarkers related to THC use. To further validate the selectivity of the biomarker profile, RNA expression patterns will be compared in the presence of another drug commonly co-used with cannabis, nicotine. Thereafter, we will determine whether THC's effects on extracellular vesicle density and RNA cargo can be attributed to release from specific cell types in the brain.

Check out the Fowler Lab Website! <https://faculty.sites.uci.edu/fowlerlab/>



## California

**Investigator:** Stephen Mahler, PhD  
**Institution:** University of California, Irvine  
Irvine, CA  
**Project Title:** Ventral Pallidum Circuits Underlying Preclinical Models of Opioid Addiction  
**Research:** Basic Research  
**Research Area:** Heroin, Fentanyl, Addiction, Substance Use Disorder, Relapse, Neural Circuits, Optogenetics, Chemo Genetics, Brain Mapping, Neural Activity, Rats, Reward, Aversion, Punishment, Translational Neuroscience  
**Earliest Start Date:** June 10, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Experience with the above techniques in computational skills/interests is preferred, especially with handling rats and microscopy.

**Project Description:** Students will learn to conduct behavioral experiments in rats, including intravenous self-administration, place preference, anxiety measures, they will assist with surgical procedures, learn to use a microscope, basics of neuroanatomy, and histology. Experiments examine how neural circuits involving the ventral pallidum participate in opioid addiction-relevant behaviors, using gene therapy-based "remote control" of targeted brain circuits, translationally relevant behavioral models of opioid addiction, and neural circuit mapping using neuroanatomical and computational approaches.

Please also note that while on-campus housing is not available via UCI, we will assist the intern in attaining nearby off-campus housing (no car needed).

# California

Investigator: Daniele Piomelli, PhD  
 Institution: University of California, Irvine  
 Irvine, CA  
 Project Title: The Lipid Hydrolase NAAA as a Target for Non-Addictive Analgesic Medications  
 Research: Basic Research  
 Research Area: Pain, Non-Opioid Analgesia, Palmitoylethanolamide, N-Acylethanolamine Acid Amidase  
 Earliest Start Date: July 1, 2024  
 Housing: On-Campus

**Student Qualifications:** The Piomelli Lab is seeking a motivated student with a background in biological, pharmaceutical, or chemical sciences who is willing to work with small animals (mice and rats). The ideal candidate will have an interest in pursuing an education or career in research. Lab and animal handling experience is preferred but not required as training will be provided.

**Project Description:** The Centers for Disease Control and Prevention estimate that approximately 70 million Americans live with chronic pain while many more suffer from acute or subacute painful conditions. This health crisis could be at least partially redressed if safe and effective analgesic medications were available. However, current therapeutics work only in a fraction of patients and exert an array of dose-limiting side effects which, in the case of the opioids, include dependence and addiction. For these reasons, the development of pharmacotherapies for pain remains an urgent societal imperative. In this NIDA-funded project, the Piomelli lab is testing the hypothesis that the cysteine hydrolase N-acylethanolamine acid amidase (NAAA) is a key control node of acute and neuropathic pain and may thus offer a promising new target for safe and effective analgesics. NAAA catalyzes the hydrolytic deactivation of palmitoylethanolamide (PEA), a lipid messenger that attenuates nociception and inflammation by engaging the ligand-operated transcription factor PPAR- $\alpha$ . The Piomelli lab has demonstrated that NAAA inhibitors exert antinociceptive effects in animal models and, with this project, is addressing three significant gaps in the understanding of NAAA-regulated antinociceptive signaling and its possible therapeutic significance, namely:

- 1) which NAAA-expressing cell population(s) is involved in nociception and is targeted by NAAA inhibitors
- 2) which PPAR- $\alpha$ -expressing cell population(s) mediates NAAA-regulated antinociception, i.e., is targeted by endogenously produced PEA
- 3) finally, whether the pharmacodynamic consequences of NAAA inhibition are compatible with safe and effective use in human pain states.

# California

Investigator: Uma Rao, MD  
 Institution: University of California, Irvine  
 Irvine, CA  
 Project Title: Effects of Early Life Adversity on Substance Use Problems in Adolescents: Biobehavioral Risk Mechanisms  
 Research: Clinical Research  
 Research Area: Adolescent, Biobehavioral, Early-Life Adversity, Inflammation, Substance Abuse, Substance Misuse  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Students should be enrolled in psychology, biological sciences, psychobiology, neuroscience, public health, or related fields, for optimal research training. This is a clinical research project involving interaction with human research subjects and a vulnerable population (i.e., children). Certification in human subjects' protection and GCP is critical for observing the research assessments. NIH sponsored certification is acceptable. Obtaining the training prior to joining the internship (available online via the CITI Program: <https://about.citiprogram.org/>) will facilitate better use of the 8-week internship program. We also require certification for MRI safety (which is provided by UC Irvine) for interns observing MRI scanning. For handling biological specimens (blood), interns will have to obtain training on Blood Borne Pathogens through UC Irvine online training program. This project does not involve work with animals or tissue samples.

On-campus housing is not available at UC Irvine. However, private housing is available within 1-2 miles and students often sublet their rental apartments/rooms during the summer.

**Project Description:** Early-life adversity (ELA), including interpersonal trauma or loss, family dysfunction and poverty, is prevalent and has profound biological, psychological, and social impacts, as well as lasting negative effects on health and well-being. Persons with ELA misuse alcohol, nicotine, and illicit drugs at an earlier age, have a quicker transition to substance use disorders (SUD), and a more pernicious clinical course compared with those who did not experience ELA. The neuroimmune network model postulates that ELA sensitizes the brain circuits involved in threat and reward processing via inflammation, initiating positive feedback loops between these systems. Also, inflammatory mediators engage these neural circuits, predisposing individuals to emotional dysregulation, and "self-medicating" behaviors, such as smoking and alcohol and drug use. Such self-medicating behaviors in adolescence, a period when the brain is highly plastic and responsive to internal and external stimuli, can exacerbate the neurotoxic effects of ELA, with a quicker transition from substance use to disorder. Using a longitudinal design, this project aims to examine the development of SUD during adolescence among youth with none, low and high levels of ELA, and without a prior history of substance misuse or SUD. The overarching aim is to identify the clinical (psychiatric symptoms, family history of SUD), biobehavioral (gene expression in immune cells and their

signaling processes, and inflammatory proteins; behavioral responses to threat, reward, and executive control processes; and coping skills) and family-contextual (family and neighborhood environment, parent-child relationship, and social support) factors that influence the association between severity of ELA and development of SUD.

As part of a supplement through intramural funding, functional and structural magnetic resonance imaging (MRI) studies will be performed to identify brain changes associated with threat, reward, and cognitive control processes and whether and how the changes in these systems relate to the development of SUD in youth exposed to ELA.

## California

**Investigator:** Lillian Gelberg, MD  
**Institution:** University of California, Los Angeles  
 Los Angeles, CA  
**Project Title:** mHealth to Enhance & Sustain Drug Use Reduction of the QUIT  
 BI in Primary Care (QUIT-Mobile)  
**Research:** Preventative Research  
**Research Area:** Substance Use, Intervention, RCT, SBIRT, Implementation  
 Science, SUD Prevention, Substance Abuse, Primary Care,  
 Prevention  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** This research requires student interns to work with adult primary care patients of federally qualified health centers (FQHCs) in Los Angeles County and the Antelope Valley. Preferred intern qualifications include having a passion for improving the health and well-being of low-income and unhoused patient populations; a strong interest in working in clinical settings; excellent organizational skills to assist the team in meeting goals within a specified time; accuracy, integrity, adaptability, and honesty; excellent communication skills; and flexibility and willingness to help out as issues arise. Related majors may include pre-medicine, pre-nursing, public health, community health, social work, psychology, sociology, or a related field.

**Project Description:** QUIT-Mobile is a NIDA-funded randomized controlled trial (RCT) of screening, brief intervention, and referral to treatment (SBIRT) for moderate-risk substance use to prevent progression to serious substance use disorders among primary care patients in Los Angeles Federally Qualified Health Centers (FQHC) community clinics over 12-month follow-up. The study compares usual care to the QUIT intervention (PCP brief advice at primary care visit, brief 30-minute telehealth coaching sessions at 2-weeks and 6-weeks post-primary care visit, demonstrated efficacious at 3-month follow-up in prior RCTs), and the novel QUIT-Mobile intervention that incorporates 12 months of weekly self-monitoring support by mobile-web app or text messaging plus automated feedback text-messaging to enhance and sustain the effects of the PCP brief advice and coaching intervention. The study launched in May 2022. All procedures have been re-designed for the telehealth environment with remote mobile-web-based screening, enrollment, assessment, and in-person clinic waiting room procedures as COVID-19 precautions allow. The project will be recruiting for 2 years. The Multiple Principal Investigators are Dr. Lillian Gelberg, M.D., M.P.H., in the Department of Family Medicine and School of Public Health at UCLA and Dr. Dallas Swendeman, Ph.D., M.P.H., in the Department of Psychiatry and Biobehavioral Sciences at UCLA.

## California

Investigator: Su Guo, PhD  
Institution: University of California, San Francisco  
San Francisco, CA  
Project Title: Role of Endocannabinoid Signaling in a Preference/Aversion Circuitry  
Research: Behavioral Research  
Research Area: Motivated Behavior, Zebrafish, Genes Brain, Behavior  
Earliest Start Date: May 13, 2024  
Housing: Off-Campus

**Student Qualifications:** Ideal interns for this project will major in the fields including neuroscience, psychology, genetics, molecular and cell biology, computational biology/bioinformatics, and have an interest for pursuing PhD after undergraduate education.

**Project Description:** This project will harvest the strength of zebrafish for molecular genetics and neural circuit analysis to determine whether drugs of abuse including opioids, marijuana, and cocaine affect a motivated behavior, which can be assayed in a high throughput way in larval zebrafish. The procedure involved in this project includes: 1) breeding of zebrafish to obtain embryos and culture them to reach ~ one-week larval stage. 2) Subject them to treatment with multiple doses of selected drugs of abuse including vehicle controls. 3) Perform the high throughput multi-trial light-dark preference behavioral assay. 4) computational analysis of behavioral data.

## California

Investigator: Cheng Ji, PhD  
Institution: University of Southern California  
Los Angeles, CA  
Project Title: Hepatotoxic Mechanisms of Anti-HIV- and Anti-COVID-19 Drugs  
and Substance Use Disorders  
Research: Basic Research  
Research Area: Alcoholism, Substance Use Disorders, Side Effects,  
Hepatotoxicity  
Earliest Start Date: May 15, 2024  
Housing: Off-Campus

**Student Qualifications:** 4th year undergraduate or master's degree students with certain research experience in biological/medical sciences or MD students.

**Project Description:** The ongoing intertwined pandemics of viral infections of HIV/AIDS and SARS-CoV-2/COVID-19 and substance use disorders (AUD), unexpectedly bring antiviral drugs and substance abuse disorders together, which severely damage the liver. This project will identify specific off-target(s) of commonly used anti-HIV and anti-COVID-19 drugs, investigate pathogenic mechanisms, and seek therapeutic solutions to mitigate the devastating side effects of antivirals on the liver.

## California

Investigator: Dong Song, PhD  
Institution: University of Southern California  
Los Angeles, CA  
Project Title: Combined Mechanistic and Input-Output Modeling of the  
Hippocampus During Spatial Navigation  
Research: Basic Research  
Research Area: Computational Neuroscience  
Earliest Start Date: May 1, 2024  
Housing: Off-Campus

**Student Qualifications:** This intern requires programming skills in Python or Matlab. The student needs to have a basic understanding of the nervous system and wants to pursue a career in computational neuroscience or neural engineering.

**Project Description:** The goal is to develop a novel modeling framework that allows us to build an anatomically, electrophysiologically, and functionally realistic full-scale model of the hippocampus. The key idea is to combine mechanistic and input-output modeling approaches in a synergistic manner like the generative adversarial network framework.



## Colorado

**Investigator:** Jason A, Hoppe, DO  
**Institution:** University of Colorado  
Aurora, CO  
**Project Title:** Improving Pain Management and Opioid Safety Through a Systemwide, Data Driven Evaluation of the CDC Opioid Prescribing Guideline Best Practices and the Use of Clinical Decision Support  
**Research:** Clinical Research  
**Research Area:** Opioid Safety, Pain Management, Clinical Decision Support, Health Policy Analysis, Opioid Use Disorder, Controlled Substances  
**Earliest Start Date:** June 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The ideal intern will have an interest in clinical research related to opioid prescribing, clinical practice guidelines, or implementation science. Career interests in clinical research, medicine, or public health. Candidates should have strong writing skills, the ability to effectively search and synthesize literature, and some familiarity with medical terminology. The intern will not be working with human or animal research participants or tissue samples.

**Project Description:** The University of Colorado Department of Emergency Medicine Opioid Research Program performs cutting edge research and programmatic implementation in the high priority and high impact areas of opioid safety in pain management and access to treatment for emergency department patients with an opioid use disorder (OUD). The team is finishing up planning and development efforts to conduct a clinical trial testing the use of clinical decision support (CDS) embedded within a hospital system's electronic health record system (EHR) to nudge medical providers to consider adopting the newly released CDC guidelines on opioid prescribing. The team has conducted qualitative interviews and focus groups with key stakeholders including providers, patients, and hospital administration. This qualitative data is being used to determine how best to design provider-facing clinical decision support to facilitate and encourage providers to utilize best practice guideline concordant care for patients with acute and chronic pain and opioid use disorder.

## Colorado

**Investigator:** Ashley Brooks-Russell, PhD, MPH  
**Institution:** University of Colorado Anschutz Medical Campus  
Aurora, CO  
**Project Title:** Novel Approaches to Assessing Cannabis Impaired Driving  
**Research:** Behavioral Research  
**Research Area:** Marijuana or Cannabis, Cannabis Impairment, Cannabis  
Tolerance, Driving Safety, Driving Under Influence, Detecting  
Impairment  
**Earliest Start Date:** April 30, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Experience with statistical analysis is preferred as well as an interest in public health.

**Project Description:** The student will be assisting with a research project that is examining objective behavioral methods to detect impairment from cannabis related to driving performance. Specific activities will include assisting with participant recruitment and/or screening, shadowing and/or assisting with data collection activities, literature review and data analysis related to the student's research project, attending project meetings with the investigator team, and other similar research project activities.

## Colorado

Investigator: L. Cinnamon Bidwell, PhD  
Institution: University of Colorado Boulder  
Boulder, CO  
Project Title: ERP Studies Of Acute Influences of THC and CBD on Memory  
Encoding and Retrieval Processes  
Research: Clinical Research  
Research Area: Health Effects of Legalized Cannabis  
Earliest Start Date: June 5, 2024  
Housing: Off-Campus

**Student Qualifications:** Seeking a motivated undergraduate who is interested in gaining research experience at the intersection of public health, neuroscience, and psychological health. Some coursework in research methods and/or statistics preferred.

**Project Description:** The purpose of the study is to investigate the effects of different forms of cannabis on memory. Now that commonly available strains of cannabis contain different amounts of various cannabinoids including THC and CBD, it is important to know how different cannabinoids affect memory and related cognitive abilities. We employ a design that includes both naturalistic and experimental elements, with cannabis users assigned to self-administer one of three randomly assigned cannabis strains immediately prior to memory encoding (i.e., learning) and/or retrieval phases of a recognition memory task while recording memory-related ERPs (via EEG).

## Colorado

**Investigator:** Angela Bryan, PhD  
**Institution:** University of Colorado Boulder  
Boulder, CO  
**Project Title:** Exploring the Anti-Inflammatory Properties of Cannabis and their Relevance to Insulin Sensitivity  
**Research:** Basic Research  
**Research Area:** Cannabis, Metabolic Processes, Insulin Function, Inflammation  
**Earliest Start Date:** April 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Coursework in research methods and statistics, content background in psychology, neuroscience, integrative physiology, or related discipline, and an interest in pursuing graduate school or medical school.

**Project Description:** Cannabis use has mixed associations with several metabolic processes, including increased caloric intake and, paradoxically, lower risk of type 2 diabetes, which suggests that increases in cannabis use could have a complex relationship to skyrocketing rates of type 2 diabetes in the U.S. The goal of this study is to begin to understand this paradox by examining the impact of cannabis strains that differ in the amount of THC and CBD (the two major cannabinoids in cannabis) on diabetogenic biological processes, in order to inform drug discovery, individual choices regarding the use of cannabis, policy decisions regulating cannabis strains, and to ultimately help to reduce the potential harm of cannabis use with respect to type 2 diabetes.

## Connecticut

**Investigator:** Roman Shrestha, PhD, MPH  
**Institution:** University of Connecticut  
Storrs, CT  
**Project Title:** Training in MHealth Prevention with MSM  
**Research:** Behavioral Research  
**Research Area:** The research area revolves around interventions and implementation science, specifically within the intersection of HIV and substance use. Emphasis is placed on designing and delivering biomedical and behavioral interventions like developing and testing mobile technologies (mHealth) apps to enhance treatment outcomes in key populations (PWID, MSM, and TGW).  
**Earliest Start Date:** June 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:**

- Strong interest in HIV, substance use, and mHealth research
- Proficiency in operating computers and research equipment
- Knowledge or willingness to learn specific applications for data acquisition and statistical analysis
- Excellent communication skills (verbal and written)

**Project Description:** The proposed research focuses on first understanding MSM's preferences of specific attributes of PrEP delivery programs, followed by developing and testing a smartphone app to deliver a combination HIV prevention intervention that incorporates pre-exposure prophylaxis among MSM. Findings will inform the development of innovative and tailored primary HIV prevention strategies to address co-occurring sexual and drug risk behaviors and to enhance the HIV prevention gap in Malaysian MSM.

# Connecticut

**Investigator:** Kristyn Zajac, PhD  
**Institution:** University of Connecticut  
 Farmington, CT  
**Project Title:** Collaborative Hub for Emerging Adult Recovery Research  
 (CHEARR)  
**Research:** Behavioral Research  
**Research Area:** Services Research, Recovery Support Services, Community-  
 Based Participatory Research, Emerging Adult Populations,  
 Opioid Use Disorder  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

## **Student Qualifications:**

- Personal or professional interest in opioid use disorder and/or recovery support services, particularly for young adults
- Lived experience (your own or through people with whom you are close) with substance use problems and/or recovery from substance use problems
- Strong attention to detail
- Skills and experience in one or more of the following: conducting literature reviews, drafting documents and summaries of other documents, creating materials for summarizing lengthier information, graphic design

Please note that, although this internship can be offered virtually, interns will be required to follow the same onboarding processes as in-person interns at UConn Health, which may require a physical, a background check, and certain required vaccinations.

**Project Description:** Recovery support services for young adults who take medications for opioid use disorder (MOUDs) are crucial and are becoming more widely available, but there is little research on the effectiveness of these services. The Collaborative Hub for Emerging Adult Recovery Research (CHEARR) is a multi-organizational initiative that aims to build the key infrastructure needed to conduct high quality research on how to best support young adults (ages 18-25) who take MOUDs; we have a particular interest in clinical continuing care models for this population. CHEARR takes a community-based participatory research (CBPR) approach by partnering with community boards consisting of young adults in recovery from opioid use disorder and peer recovery support specialists who have expertise in supporting emerging adults. All of CHEARR's activities are centered on the lived experience of those impacted by the opioid epidemic because we believe that bringing together research expertise and lived experience leads to better research. Lived experience is also a preferred qualification for this internship and for all other positions on the team. CHEARR's primary site is the University of Connecticut School of Medicine (UConn Health), a vibrant academic

medical center located in central Connecticut. You can learn more about the overall CHEARR project at: [www.chearr.org](http://www.chearr.org)

## Connecticut

Investigator: Frederick Altice, MD  
 Institution: Yale University School of Medicine  
 New Haven, CT  
 Project Title: Reducing Stigma in People Who Inject Drugs with HIV Using a Rapid Start Antiretroviral Therapy Intervention  
 Research: Behavioral Research  
 Research Area: Stigma, HIV, People Who Inject Drugs, PWID, People Who Use Drugs, PWUD, Antiretroviral, ART, Guidelines, Rapid Start, Intersectional Stigma, Discrimination, Harm Reduction, Infectious Diseases  
 Earliest Start Date: May 20, 2024  
 Housing: Off-Campus

**Student Qualifications:** The intern should have an interest in health disparities and discrimination, stigma research, harm reduction, and infectious diseases. The intern should be well organized and eager to learn. The intern should be interested in a career in public health and/or medicine.

The student will not work with animals or tissue samples. The student may work with humans.

### **Project Description:**

HIV transmission continues in low- and middle-income countries (LMIC), especially among key affected populations (KAP) and in settings of high stigma and discrimination. In Malaysia, a LMIC in SE Asia, HIV incidence and mortality is increasing. HIV is concentrated among KAPs, especially people who inject drugs (PWID) a group which has substantially lower ART prescription and viral suppression (VS) levels relative to other KAPs, undermining HIV treatment as prevention (TasP) goals. PWID are especially vulnerable to overlapping and intersectional stigmas due to criminalization of drug use and sex work, experiences with incarceration, social class, and high levels of HIV itself. Our preliminary studies confirm high levels of negative stereotypes, prejudice, and stigma toward PWID among medical students and HIV experts, with clear evidence of intention to discriminate against PWID by withholding ART prescription. Stigma-reducing interventions have mostly centered on educational and contact-based strategies. Such strategies, however, appear less effective where stereotypes and stigma are deeply entrenched, as in Malaysia, thus requiring the introduction and testing of alternative strategies.

Behavioral design interventions use tools like framing, nudges, and choice architecture, which can be used to re-design how physicians behave – or make non-discriminatory healthcare decisions. Rapid start antiretroviral (RS-ART) is an evidence-based strategy to initiate ART immediately, thereby supporting TasP goals by reducing time to VS, achieving VS and improving individual health. It has not been tested among PWID. The behavioral design intervention re-arranges clinician decision-making by first focusing on eligibility criteria (i.e.,



presence of opportunistic infections) rather than inaccurate perceptions of ART adherence or deservedness. Behavioral design interventions have not been tested in HIV stigma research, nor have they been assessed longitudinally or by infusing clinically relevant dyads analyses of patients and clinicians.

To guide the behavioral design of RS-ART among PWID, we will use the Delphi method to develop guidelines. Then we will use nominal group technique, a rank-ordering mixed method strategy to assess the multi-level barriers and facilitators to RS-ART for PWID, to adapt existing RS-ART protocols for PWID. Once the new guideline concordant RS-ART protocol is developed, we will pilot test it in 125 PWID over six months and conduct a longitudinal dyadic analysis of patients and clinicians of stigma, physician trust and social support. The RS-ART protocol will be refined further during pilot-testing to determine its utility as a stigma-reducing intervention that can be tested in a future implementation trial.

## Connecticut

**Investigator:** Krysten Bold, PhD  
**Institution:** Yale University, School of Medicine  
New Haven, CT  
**Project Title:** Evaluating the Potential Impact of a Menthol Ban in Cigarettes and E-Cigarettes Among Current Menthol Smokers  
**Research:** Clinical Research  
**Research Area:** Tobacco, Smoking, E-Cigarette, Menthol-Ban, Public Health, Randomized Clinical Trial  
**Earliest Start Date:** June 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Intern should have an interest in learning clinical research methods. Coursework or major related to psychology or other sciences preferred. No prior knowledge of statistical software is required. Some knowledge of, or experience with Microsoft excel, PowerPoint, and word is preferred. Those interested in a career in clinical research, medicine, public health, or policy are encouraged to apply for this experience. Interns will be involved in human subject research and will receive appropriate training, no prior experience in human subject research is needed.

**Project Description:** The summer intern will work on the ongoing project ‘Examining the impact of banning menthol flavor in cigarettes and e-cigarettes on smoking behavior’. It is a randomized controlled trial (RCT) that is recruiting adults from the community who smoke menthol cigarettes to examine the extent to which possible flavor bans in cigarettes, e-cigarettes, or both products impact smoking behavior and health. During the summer internship period, this project will be actively recruiting participants, and ongoing tasks will include data entry, monitoring recruitment, assisting with daily tasks for research visits.

## Connecticut

**Investigator:** Jaimie Meyer, MD  
**Institution:** Yale University, School of Medicine  
 New Haven, CT  
**Project Title:** Integrated eHealth for HIV and Substance Use Disorders in Justice-involved Women  
**Research:** Clinical Research  
**Research Area:** Women Involved in the Criminal Justice System, Pre-Exposure Prophylaxis (PrEP), HIV Prevention, Medications for Opioid Use Disorder, Integrated Care, Telehealth  
**Earliest Start Date:** June 10, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The applicant should have a demonstrated interest in working with women involved in the criminal justice system, women's health, HIV prevention and treatment, or substance use/ treatment for opioid use disorder. Prior experience working with this population is preferred but not required. Bilingual/bicultural applicants who speak Spanish are encouraged to apply.

**Project Description:** The primary objective of our study, Project Athena is to address the urgent need for HIV prevention and medication for opioid use disorder (MOUD) in women involved in the criminal legal system (WICL). This study uses a two parallel-arm randomized clinical trial design to compare the “Athena strategy,” a model that includes a newly validated decision aid and eHealth to remotely deliver integrated pre-exposure prophylaxis (PrEP) and MOUD, to a PrEP decision aid-only to women within the diverse settings of New Haven, CT and Birmingham, AL. The “Athena strategy” will be compared to the decision aid-only in terms of patient-level engagement in the PrEP care continuum among WICL with opioid use disorder (OUD). The primary clinical outcome is PrEP initiation over six months and secondary outcomes are 6-month PrEP retention and engagement in the OUD treatment cascade. Additionally, the complexity of substance uses disorder (SUD) treatment (e.g., court-mandated vs. voluntary, behavioral vs. MOUD) and changes in treatment engagement over time will be assessed. Using this innovative healthcare delivery model that integrates services, the goal is to reduce social and structural barriers to facilitate engagement of prevention services, as well as holistically improve one’s quality of life.

Participants will be recruited from criminal legal sites and other community settings that serve WICL with OUD. All participants who meet eligibility criteria will participate in a structured study interview and receive POC testing for hepatitis C, syphilis, toxicology, and gonorrhea/chlamydia.

## Connecticut

**Investigator:** Janitza L. Montalvo-Ortiz, PhD  
**Institution:** Yale University, School of Medicine  
 Orange, CT  
**Project Title:** Deciphering the Single-Nucleus Genomic Regulatory Structure of  
 Opioid Use Disorder in the Human Brain  
**Research:** Clinical Research  
**Research Area:** Substance Use Disorders, Opioid Use Disorder,  
 Neuroepigenetics, Single Nuclei Multiomics, Human Postmortem  
 Brain, DNA Methylation, DNA Hydroxymethylation, RNA  
 Sequencing, Gene Expression, 3D Chromatin Organization,  
 Functional Genomics, Integrative Multiomics, Joint Multiomic  
 Profiling  
**Earliest Start Date:** June 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Basic coding skills are preferred, but not required, as we are equipped to provide training in this area. The research may require the student to learn to work with human postmortem brain tissue samples.

**Project Description:** Substance use disorders (SUDs) are a serious public health concern because of their high disease burden and mortality risk. Among the SUDs, opioid use disorder (OUD) has reached epidemic levels in the United States, associated with increased rates of hospitalization and drug overdose death. This opioid epidemic has recently worsened during the COVID-19 pandemic, as shown by a significant steep rise of up to 29.4% in opioid overdose deaths during 2020<sup>1</sup>. While genetic risk factors have been identified in recent large-scale genome-wide association studies (GWAS) of OUD, these explain only part of the variance. Environmental factors interplay with the genetic background to influence OUD via epigenetic mechanisms. Multiple epigenetic modifications regulate gene expression that impacts behaviors relevant to opioid addiction. As epigenetic marks regulate gene expression in a cell-type-specific manner, the mixing of cell types in bulk tissue analyses may obscure cell-type-specific findings. This study will conduct a joint profiling of multi-omics including DNA methylation, DNA hydroxymethylation, RNA sequencing and HiC in a single-nuclei resolution in human postmortem brain, focusing on brain regions that are part of the addiction circuitry.

## Connecticut

**Investigator:** Ijeoma Opara, PhD, LMSW, MPH  
**Institution:** Yale University, School of Medicine  
 New Haven, CT  
**Project Title:** Integrating Community Based Participatory Research and  
 Machine Learning Methods to Predict Youth Substance Use  
 Disorders for Urban Cities in New Jersey  
**Research:** Preventive Research  
**Research Area:** Prevention Research, Data Science, Community Based  
 Participatory Research, Youth Drug Use, Urban Communities  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The potential intern will have to have experience in working directly with youth and young adults. The intern will be expected to visit research sites in New Jersey. The intern can have a bachelor's degree in the following (but not limited to): public health, social work, computer science, data science, environmental health, or a similar field.

**Project Description:** The field of addiction does not know the exact characteristics within a neighborhood that can serve as either protective or risk factors to substance use disorders within an urban community. This research project will combine innovative approaches and multiple forms of data to investigate neighborhood level factors by using participatory methods to co-create machine learning systems to predict and prevent substance use disorders with community members. The work will shed light on the importance of place in addiction and work towards eliminating racial bias in data sets and predictive algorithms by incorporating community members in all stages of the model development process. Findings from this study have the potential to change the way researchers conduct substance use and misuse prevention research and the way in which the field formally engages with community members. This work can contribute significantly to achieving health equity for Black and Hispanic youth in urban communities. A sub-set of the project involves training youth to collect data and be a part of the research process. The potential intern will be expected to work collaboratively with experts within the lab to develop curriculum materials and/or facilitate sessions with youth based on interns' experience and qualifications.

# Florida

Investigator: Adam Carrico, Ph.D.  
 Institution: Florida International University  
 Miami, FL  
 Project Title: Optimizing Prep Adherence in Sexual Minority Men Who Use Stimulants  
 Research: Behavioral Research  
 Research Area: Sexual and Gender Minorities, Cocaine, Methamphetamine, Pre-Exposure Prophylaxis, Randomized Controlled Trial  
 Earliest Start Date: May 6, 2024  
 Housing: Off-Campus

**Student Qualifications:** Pursuing a bachelor's degree in the social/behavioral sciences, public health, or pre-medicine.

**Project Description:** Among men who have sex with men (MSM), there is an urgent need to optimize the unprecedented clinical and public health benefits of pre-exposure prophylaxis (PrEP) to prevent HIV with those who use stimulants (i.e., methamphetamine, cocaine, and crack-cocaine). Stimulant-using MSM display 3-6-fold faster rates of HIV seroconversion, and one-in-ten MSM with newly diagnosed HIV infection report recent stimulant use. Findings from our team and others also demonstrate that stimulant use is a key obstacle to PrEP adherence and persistence. Stimulant-using MSM have a 3-fold greater rate of disengagement from PrEP care and 5-fold greater odds of sub-optimal PrEP adherence. The proposed multi-site randomized controlled trial (RCT) will leverage a promising intervention model of delivering a positive affect intervention during contingency management (CM), which we have recently demonstrated achieves durable and clinically meaningful reductions in viral load among HIV+, methamphetamine using MSM. In the proposed multi-site RCT, we plan to test whether delivering an Affect Regulation Treatment to Enhance Medication Intervention Success (ARTEMIS) positive affect intervention during smartphone-based CM for directly observed PrEP doses achieves more durable reductions in HIV acquisition risk over 12 months. HIV acquisition risk (the primary outcome) will be operationalized as tenofovir diphosphate (TFV-DP) levels <700 fmol per punch and self-reported recent condomless anal sex (CAS). Up to 300 MSM on PrEP who report stimulant use and CAS in the past 3 months as well as any PrEP non-adherence in the past month will be recruited from social networking applications as well as PrEP clinical services in South Florida and San Francisco. Participants who meet the inclusion and exclusion criteria at an in-person baseline assessment will provide a dried blood spot (DBS) specimen that will be stored to measure TFV-DP levels and begin 3-months of smartphone-based CM that includes financial incentives for completing up to four directly observed PrEP doses per week (48 doses total over the 3 months). Participants will complete a run-in period (waiting period) where they will complete 4 directly observed smartphone-based CM PrEP doses prior to randomization. At a separate randomization visit, 240 participants (120 South Florida and 120 San Francisco) will be randomized to receive their first individually delivered ARTEMIS positive affect intervention or attention-control session.

All 5 individually delivered intervention sessions will be delivered during the 3-month CM intervention period. Follow-up assessments will be conducted at 3, 6, and 12 months after beginning CM, with DBS collected to measure TFV-DP at 6 and 12 months. Consistent with the NIH OAR high priority area of “reducing the incidence of HIV/AIDS,” this clinical research will meaningfully inform the targeted deployment of limited public health resources to optimize the unprecedented clinical and public health benefits of PrEP in stimulant using MSM, one of highest priority populations for decreasing HIV incidence.

## Florida

**Investigator:** Linda B. Cottler, RN, PhD, MPH  
**Institution:** University of Florida  
Gainesville, FL  
**Project Title:** National Drug Early Warning System Coordinating Center  
**Research:** Epidemiology Research  
**Research Area:** National Surveillance, Substance Use Trends, Novel Methods, Machine Learning, Novel Psychoactive Substances  
**Earliest Start Date:** May 13, 2024  
**Housing:** On-Campus

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

**Project Description:** This Summer Research with NIDA program is conducted within the Department of Epidemiology, uniquely housed in both the College of Public Health and Health Professions and the College of Medicine, at the University of Florida. The eight-week internship is structured as part of the parent grant, the NIDA-funded U01 National Drug Early Warning System (NDEWS) and will include multiple opportunities for the assigned student to learn about and participate in various aspects of drug abuse research. This project utilizes novel methods of surveillance to provide the field with the most timely, salient, and valuable information on emerging substance use trends. The intern will be exposed to all areas of the project through weekly research team meetings including collaborators from other institutions along with NIDA Scientific Officer Dr. Erin Parker. These varied experiences will provide a solid introduction to methods and topics in drug abuse research, which will facilitate honing and developing the intern's research interests.



## Florida

Investigator: John Neubert, PhD  
Institution: University of Florida  
Gainesville, FL  
Project Title: Opioid and Cannabinoid Interactions in Pain and Reward  
Research: Basic Research  
Research Area: Cannabidiol (CBD), Opioids, Pain Behavior, Immune cells,  
Substance Use  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** No specific research experience is needed as we will train students on specific procedures. The research project requires working with animals and doing benchtop work. If interested, students will be trained to do specific nerve-injury surgeries. Data management and analysis will be required as well using Excel, AnyMaze, and Graph Pad software programs.

**Project Description:** Chronic pain is a significant public health problem that costs society billions of dollars per year and causes great suffering in countless individuals. Opioid-based medications are among the most prescribed for various forms of chronic pain contributing to the current opioid epidemic. Recently, cannabis and cannabinoid compounds (e.g., cannabidiol (CBD)) have been described as having pain-alleviating properties. While CBD may offer alternatives to opioid treatments for pain, few well-controlled studies demonstrate analgesic efficacy, especially for CBD. Our proposed project will focus on a heuristic approach that incorporates fundamental pharmacology and novel operant behavioral assays of pain. For the Summer Research Program, students will learn novel pain assays and other behavioral tests. Additionally, students will participate in benchtop-type studies (e.g., flow cytometry, ELISA's, etc.) to gain a better understanding of how immune cells respond to CBD treatment and in turn, modify pain behaviors.

## Georgia

Investigator: Chethan Pandarinath, PhD  
 Institution: Emory University/Georgia Tech  
 Atlanta, GA  
 Project Title: Robust Modeling of Within- and Across-Area Population  
 Dynamics Using Recurrent Neural Networks  
 Research: Basic Research  
 Research Area: Machine Learning, Artificial Intelligence, Computational  
 Neuroscience, Motor Neuroscience, Deep Learning, Neural  
 Networks  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** Experience with Python. Proficiency in Calculus, Differential Equations, Linear algebra. Interest in neuroscience and high-dimensional data.

**Project Description:** Over the past several decades, the ability to record from large populations of neurons (e.g., multi-electrode arrays, neuropixels, calcium imaging) has increased exponentially, promising new avenues for understanding the brain. These data have the promise to provide a qualitatively different view of activity within and across brain areas than was previously possible, but the effort will require the development of advanced analytical tools. One natural framework is provided by the tools of dynamical systems, which offer the means to uncover coordinated time-varying activation patterns expressed across an interconnected network of recorded neurons, and to characterize how these patterns relate to behavior. This framework has provided fundamental new insights into information processing in these cortical circuits, including those underlying motor, sensory, and cognitive processes. However, previous analytical approaches to uncovering dynamics have typically been developed and tested in specific brain areas, for limited behaviors, in restricted behavioral settings. Ironically, it is not unusual for these methods to have  $10^5$  parameters that need to be set or learned and require careful tuning to properly function. Yet the brain is not homogenous, and it is unclear how well these approaches can be made to generalize to a variety of brain areas and behaviors, let alone by researchers who are not intimately familiar with the methods. Further, if the brain's dynamics stem from independent, isolated areas is a vast oversimplification. Clearly, perceptual, cognitive, and motor functions all rely on activity distributed across multiple, interacting brain areas, each of which likely has distinct dynamics. Communication between areas is a dynamic process that underlies flexible function. There is growing recognition that population dynamics are specifically structured to support inter-area interaction, and an immediate need for methods to accurately uncover dynamics between interacting areas. We will address the challenge of generalized applicability to diverse brain areas by developing a powerful new open-source toolkit for automated discovery of neural population dynamics, within highly divergent brain areas. Further, we will extend this toolkit with new neural network architectures to model the dynamics between interacting areas. Our approach, the Dynamical Systems ID toolkit (DSID), will support accurate and straightforward

application to data from different brain areas and behaviors without requiring great expertise or infrastructure setup. DSID will leverage sequential autoencoders (SAEs), powerful and flexible deep learning architectures that use recurrent neural networks to characterize nonlinear dynamical systems. We will validate the generalizability of DSID using a combination of previously collected and new multi-electrode recording data from monkeys, including motor, sensory, and cognitive areas of cortex. Following their development and validation in our labs, we will work to disseminate them throughout the appropriate research communities where we expect they will be further developed with application to an even broader range of brain areas and behaviors.

## Georgia

**Investigator:** Debra Bangasser, PhD  
**Institution:** Georgia State University  
Atlanta, GA  
**Project Title:** Sex Differences in Stress Inoculation of Addiction-Like Phenotypes  
**Research:** Basic Research  
**Research Area:** Stress, Early Life Adversity, Sex Differences, Motivated Behavior, Impulsivity, Risky Decision Making, Transcriptomics, Epigenetics, Glia  
**Earliest Start Date:** May 27, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Background in neuroscience, biology, or psychology preferred. Interest in research: This work will include rat behavioral tasks and tissue processing, so the intern must be willing to work with these approaches, although no prior experience is necessary.

**Project Description:** Early life experiences can have lasting effects on cognition and motivated behavior. The lab uses a rat model of early resource scarcity to understand the neurobiological mechanisms by which early stress can alter opioid self-administration, impulsivity, and risky decision-making. We are finding that male rats are more affected by early resource scarcity than female rats and we are also trying to understand the origin of this sex difference. In addition to looking at changes in rat behavior, we look at molecular endpoints such as changes in gene transcription and epigenetic processes that underlie the lasting effects of early adversity. A new direction for the lab is to look at these changes in glial cells, in addition to neurons. We are finding that astrocytes, which develop in the postnatal period, are particularly affected by early experience and are understand the role astrocytes play in our behavioral effects.

## Georgia

Investigator: Ali Gheidi, PhD  
Institution: Mercer University  
Macon, GA  
Project Title: Norepinephrine Modulates Medial Prefrontal Cortex Neural Ensembles That Control Cocaine Seeking Behavior  
Research: Basic Research  
Research Area: Cocaine Reinstatement, Neuronal Ensembles, Norepinephrine, Medial Prefrontal Cortex, Fos  
Earliest Start Date: June 1, 2024  
Housing: On-Campus

**Student Qualifications:** Desired qualifications include having done animal handling, intracranial and catheter surgery, experience with tissue sectioning and staining. Portions of this intern opportunity may involve rats.

**Project Description:** My research attempts to understand the neurobiology of relapse to cocaine taking. The students will be involved in behavioral studies, surgery, or the wet lab performing immunofluorescence. The behavioral portion consists of conditioned place preference and drug self-administration. The surgery consists of intracranial surgery of viral vectors and jugular catheter implantation.

# Georgia

Investigator: Assaf Oshri, PhD  
 Institution: University of Georgia  
 Athens, GA  
 Project Title: A Neuroecological Approach to Examining the Effects of Early Life Adversity on Adolescent Drug Use Vulnerabilities Using the ABCD Dataset  
 Research: Behavioral Research  
 Research Area: Children and Youth Rural Resilience, Neurooncological Research, Developmental Psychopathology, and Developmental Cognitive Neuroscience  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** Data processing and analysis comfort level. R software is preferable.

**Project Description:** Early life adversity (ELA) is a multidimensional and potent risk factor for neurocognitive risk, downstream drug use vulnerabilities, and adolescent drug use and misuse. The effects of ELA on youth's drug use risk depend on multiple dynamic family, peer, school, community, and sociocultural risk and protective contexts. Yet, a significant knowledge base is missing to further our understanding of the contexts in which neural biomarkers affect drug risk vulnerabilities and behaviors in adolescence. Emerging research and theory implicate neuroregulatory systems that underpin emotion and behavioral regulation as a powerful focus for adolescent drug use risk investigations.

We focus on individual differences in neuroregulatory systems whereby cognitive control networks become more effective over time in modulating emotion processing networks, including the emotion/salience and reward salience networks. According to this dual system view, a neuroregulatory imbalance between the socioemotional network (or ERSN, comprised of the emotional, reward, and salience networks) and CCN ushers in diminished self-regulation abilities that underlie drug risk behaviors in adolescence.

This developmental mechanism and subsequent risk behaviors may be differentially affected by youth's dimensional stress. Extant developmental studies have cataloged psychosocial risk and protective processes that moderate the impact of ELA and the development of drug use vulnerabilities in adolescence. Yet ecological approaches remain rare in neuroscience approaches. Using a developmental ecological neuroscience approach, we propose to investigate neurocognitive mechanisms that mediate, and the contextual factors that moderate, the effect of ELA on drug-related vulnerabilities and drug use.

We will focus on the impact of ELA on developmental changes in functional activation and communication (i.e., functional connectivity; FC) between the ERSN and CCN networks and its mechanistic role in leading to adolescent drug use vulnerabilities and later drug use. We

propose to use a large, longitudinal dataset: the Adolescent Brain Cognitive Development Study (ABCD; N=11,883; ages 9-10 at baseline and 11.5-12.5 at wave 6). We aim to test (a) the developmental cognitive mechanisms that mediate the effect of ELA on drug use vulnerabilities and attendant drug use and misuse (b) the moderating influence of family, peer, school, community, and sociocultural contexts on the neurocognitive processes that lead to drug use vulnerabilities.

Modeling multilevel latent change in ecological, behavioral, and neuroimaging data is critical to further the precision and specificity of developmental models and preventative intervention programs for drug addiction resilience in adolescence.

## Illinois

**Investigator:** Sara Becker, PhD  
**Institution:** Northwestern University  
 Chicago, IL  
**Project Title:** Improving Outcomes of Adolescent in Residential Substance  
 Use Treatment via a Technology-Assisted Parenting Intervention  
**Research:** Clinical Research  
**Research Area:** Implementation, Adolescent, Digital Health, Opioid, Contingency  
 Management  
**Earliest Start Date:** June 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interest in implementation science, clinical research, and/or community partnerships preferred. Interest in substance use interventions is also beneficial. Strong interpersonal skills, time management, and attention to detail required. Opportunities to contribute to manuscripts or conference presentations could be available for students with strong writing skills. Professional development support will be offered to students with an interest in applying to graduate school.

**Project Description:** The summer intern will have the opportunity to contribute to one of three active grants designed to increase the uptake of effective addiction health services in community and clinical care settings. Interns may select which project(s) to contribute to base on their professional development goals. The first is called Parent SMART and is a pragmatic effectiveness trial testing a technology-assisted intervention among 220 parents of adolescents in residential treatment. The second is called Project MIMIC2 and is a partnership with 10 opioid treatment programs. The trial tests whether a multi-level implementation strategy can help opioid treatment programs to deliver an effective intervention called contingency management (CM) as part of their routine workflow. The third is the Research Adoption Center, a NIDA-funded center of excellence designed to advance the implementation of effective treatments for opioid use disorder and pain management.



## Illinois

Investigator: Michelle Birkett, PhD  
 Institution: Northwestern University  
 Chicago, IL  
 Project Title: Network Canvas 2.0: Enhancing Network Data Capture for Drug Use and HIV Research  
 Research: Other Research  
 Research Area: Social Network Analysis, Public Health, HIV, STIs, Infectious Disease, Sexual and Gender Minorities, Substance Use, Multilevel Influence, Network Data, Data Collection, Social and Behavioral Health, Prevention, Population Dynamics, Community Outreach, Software, Digital Tools, Social Stigma, Surveys  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

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

**Project Description:** This project emerges from the recognition that social factors drive both drug use and infectious disease, including HIV; yet, to systematically capture social data - such as network and contextual data - from the most at-risk populations presents substantial methodological challenges for researchers. To help simplify the collection and management of these complex data, our team built a free, open-source suite of tools called Network Canvas ([www.networkcanvas.com](http://www.networkcanvas.com)) that allows researchers to easily design their own network surveys, regardless of technical knowledge, and administer these surveys directly to participants using a series of intuitive, touch-optimized interfaces. Although Network Canvas has substantially improved the ability of researchers to capture network and contextual data, further enhancements are needed to modernize the tool quickly and accurately for use in leading-edge substance use and infectious disease research.

Specifically, this project aims to develop a new cloud-based platform, Studio, which will include the functionality of the existing Network Canvas on-premises tools and provide a range of new features to facilitate improved data reproducibility, timeliness, and measurement for researchers and availability and accessibility for study participants. Throughout the development of Studio, our team will conduct user-engagement activities to inform the software's design and rigorously evaluate its value and impact on the measurement of networks relevant to epidemic modeling, HIV, and drug use research.

## Illinois

**Investigator:** Sarah Helseth, PhD  
**Institution:** Northwestern University  
Chicago, IL  
**Project Title:** Development and Preliminary Testing of an Adjunct Smartphone App to Reduce Marijuana Use in Court-Involved, Non-Incarcerated Adolescents  
**Research:** Behavioral Research  
**Research Area:** Adolescent, Cannabis, Substance Use, Juvenile Justice, Digital Health, Treatment Development  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Student will complete a required ethics training prior to engaging in any research activities. The Juvenile Court is currently hybrid in-person/virtual, and thus may require being in-person in Summer 2023. Preferred skills include coursework in Child or Developmental Psychology & Research Methods. The ideal applicant will have some interest/experience in treatment, working with adolescents and families, substance use, technology, and an interest in scientific writing and presentations.

**Project Description:** Dr. Helseth is interested in working with a student seeking treatment research experience on her NIH-funded study of substance use problems in high-risk youth. Teenagers who use cannabis and go to juvenile court are more likely to face arrest or addiction in the future. Treating their cannabis use within the court system is ideal, but treatments would need to be inexpensive and easy to deliver. This study will test a new smartphone app to help teenagers in the court system cut down on their use of cannabis and other substances. Phase III of the research is ongoing and will provide the main opportunities for hands-on training during Summer 2024.

## Illinois

**Investigator:** Patrick Janulis, PhD  
**Institution:** Northwestern University  
Chicago, IL  
**Project Title:** Leveraging Data Synthesis to Identify Optimal and Robust Strategies for HIV Elimination Among Substance-Using MSM  
**Research:** Epidemiology Research  
**Research Area:** Substance Use, HIV, Network Analysis, Epidemic Modeling  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Ideal skillsets include a basic knowledge of data analysis or statistical programming (e.g., R, Python, SAS, STATA) and an interest in HIV prevention and sexual and gender minority health, but no prior research experience is required. Majors in epidemiology, psychology, public health, sociology, or related fields preferred. All research activities will be conducted with existing data.

**Project Description:** Alcohol and methamphetamine use increases risk of HIV among men who have sex with men (MSM). Yet, despite a considerable body of research documenting these associations, substantial uncertainty remains regarding the specific behavioral pathways between substance use and HIV that are most responsible for this elevated risk. This project seeks to better identify the behavioral pathways between substance use and HIV acquisition among MSM. To do so, this project leverages several large existing datasets to estimate the effect of these substances on behavior and sexual network characteristics, using these estimates to inform network-based simulation models of HIV. The summer intern will assist ongoing secondary data analysis projects within this study to examine the intersection of substance use and HIV risk among MSM.

## Illinois

Investigator: Kelli Scott, PhD  
 Institution: Northwestern University  
 Chicago, IL  
 Project Title: Pilot Implementation of Measurement-Based Care in Community  
 Opioid Treatment Programs  
 Research: Clinical Research  
 Research Area: Implementation Science, Community-Engaged Research,  
 Measurement-Based Care, Hybrid Effectiveness-Implementation  
 Study, Rapid Ethnography, Psychosocial Interventions,  
 Substance Use Treatment, Opioid Use Disorder, Opioid  
 Overdose, Opioid Treatment Programs, Mixed Methods,  
 Measure Design, Intervention Development and Adaptation  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** An educational background in psychology or public health is preferred, however no prior research experience is needed for this internship. This project would be particularly relevant for interns interested in graduate training and/or a career in counseling, clinical psychology and/or implementation science. This project will require students to work with human participants. Familiarity with Microsoft Word and Excel is preferred, along with strong organizational and communication skills.

**Project Description:** Summer interns will have the opportunity to participate in a two-phase research project that is focused on improving the quality of treatment for opioid use disorder. This project involves using implementation science methods to develop and test a measurement-based care intervention for use in community opioid treatment programs. Measurement-based care is a research-supported intervention that involves a counselor administering a self-report symptom measure to clients, reviewing measure scores, and discussing the clients' responses in a counseling session. Measurement-based care has not been well-studied in community opioid treatment programs, so this project involves building community partnerships with programs offering opioid use disorder treatment. To help build these community partnerships, the study Principal Investigator (PI) is working with treatment programs to collect mixed methods data (observational data, qualitative interviews, and quantitative surveys) from leaders, counselors, and clients to understand: a) barriers to measurement-based care use; and b) potential ways that measurement-based care should be adapted to fit the needs of counselors providing treatment for opioid use disorder. This data will be analyzed and used to adapt a measurement-based care protocol that will be implemented and tested in opioid treatment programs in the Chicagoland area.

## Illinois

**Investigator:** Jessica Ridgway, MD  
**Institution:** University of Chicago Medicine  
 Chicago, IL  
**Project Title:** Achieving Equity in Patient Outcome Reporting for Timely Assessments of Life with HIV and Substance Use (ePORTAL HIV-S)  
**Research:** Clinical Research  
**Research Area:** HIV, People Living with HIV, Collaborative Care, Substance Use  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** This research will require students to work with humans both in person and by calling, emailing, and/or writing letters to past research participants about their utilization of the patient portal. Summer interns will also perform basic statistical analysis.

Strong communication skills are required. Experience working with marginalized communities is encouraged. Experience with basic statistical analysis is preferred.

**Project Description:** Substance use disorder (SUD) and HIV are synergistic epidemics (syndemics) disproportionately affecting Black Americans. Structural racism related to inadequate access to healthcare, stigma, and criminalization, especially among those with intersectional identities related to gender and sexual minorities, further exacerbate disparities in HIV and SUD outcomes. To decrease barriers to SUD screening (clinic-based, in-person) and treatment (referral-focused), the research team aims to implement and evaluate multi-level interventions through a program called ePORTAL HIV-S. Alongside the ePORTAL Community Advisory Board, the research team will carry out 4 aims:

- 1) Design and implement a strategy to increase patient portal engagement among Black PLWH
- 2) Perform a randomized controlled trial to assess effectiveness of population health (i.e. portal-based) vs. usual (clinic-visit) SUD screening among PLWH in an HIV clinic
- 3) Implement and evaluate CoCM for SUD in an HIV clinic
- 4) Develop an implementation guide for external dissemination of ePORTAL HIV-S.

As a part of the research team, the intern will participate in Aim 1 of the study which focuses on engaging patients in patient portal use. Patient portals are secure websites, or web-based applications, that give patients access to their health information from anywhere with a web connection. Portals can be enabled to send patients questionnaires to complete before clinic appointments, or even when no appointments are scheduled. Portal use is associated with improved health outcomes, but minoritized communities appear less likely to use portals. In Aim 1, a community health worker is providing an educational intervention to increase use of the patient portal among Black patients with HIV. The patient portal will then be utilized for substance use screening later in the research study. The intern will participate in the patient

portal education intervention and analyze data related to patient portal utilization. Our ultimate goal is to achieve health equity in SUD screening and treatment among Black PLWH.

# Indiana

Investigator: Hyowon Lee, PhD  
 Institution: Purdue University  
 Lafayette, IN  
 Project Title: User-Centric Development of Closed-Loop Therapy for Opioid Overdose  
 Research: Other Research  
 Research Area: Advanced Harm Reduction Strategy, OUD User Needs, Technology Development  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** Ideally, the intern should be a Junior or Senior undergraduate student majoring in Biomedical Engineering, Electrical Engineering, or related fields. A basic understanding of drug delivery systems is preferred, particularly the foundational principles of diffusion, skin anatomy, and current technologies in transdermal drug delivery. Although we do not expect the student to possess an in-depth knowledge of propellants, we are keen to find someone who is highly motivated. The ideal candidate would be eager to learn new research topics and techniques, diving into basics of electronics, drug delivery systems, and micropropellants for innovative biomedical applications.

**Project Description:** To address the need for rapid emergency treatment of opioid overdose, there are several emerging solutions for automated detection of overdose including a smartphone-based respiration monitor and an implantable tissue oxygenation monitor; however, these do not have drug delivery mechanisms to reverse the effect of overdose. There is ongoing research on fully or partially implantable drug delivery devices [3] with integrated respiration monitors (not FDA-approved), but these are invasive, and the user adaption may be questionable. Moreover, there are efforts to use conventional mechanical needle-based wearable patch systems to close the loop in treating OUD patients. However, these are relatively cumbersome with limited usability as well due to issues related to adhesion, limited duration, and size and visibility leading to poor patient compliance.

To tackle the need for better adaptation of emergency automatically administered naloxone delivery system, here we propose to develop a novel non-invasive, needle-free, wrist-worn, drug delivery system utilizing solid-fuel micro-propellant [4] to transcutaneously deliver naloxone through the skin. This initiative is a continuation of our ongoing efforts to create user-centric engineered solutions to address major biomedical challenges. Our Summer Internship project falls within a larger proposal focused on the development of wrist-worn wearable devices designed to detect and counteract opioid overdoses, with micropropellants serving as the actuator in a plunger-based mechanism. The primary objective of this project is to showcase the ability of BTATz to generate high-speed microjets ( $>100$  m/s) suitable for needle-less transdermal drug delivery. Additionally, we aim to enhance our previous Near-Infrared Spectroscopy (NIRS) sensor. This enhancement targets the detection of hypoxia-

driven opioid overdoses, incorporating both analog and digital filtering techniques to improve the signal-to-noise ratio (SNR) of output signals. We will also integrate a low-power Bluetooth module for wireless data transmission. We anticipate achieving these milestones during our Summer Internship, as detailed in the following specific aims:

Aim 1: Proof-of-concept demonstration of transdermal needleless drug delivery using novel micro-propellant. In this aim, in collaboration with our interdisciplinary team from Zucrow, the world's leading academic propulsion lab, we will employ a novel high-nitrogen solid fuel micro-propellant (BTATz) as the actuation mechanism in a plunger-based system. Our goal is to demonstrate that this mechanism can achieve the necessary pressure to generate a high-speed microjet exceeding 100 m/s, an essential requirement for efficient transdermal drug delivery. We will employ a high-speed camera combined with a force sensor to measure the microjet's speed and the resultant pressure, both as functions of BTATz volume.

Aim 2: Design and Fabrication of an Enhanced Near-Infrared Spectroscopy (NIRS) for Detecting Simulated Hypoxia-Driven Opioid Overdose: Leveraging our expertise and prior accomplishments in detecting opioid overdose using wearable methodologies, we aim to design and fabricate an enhanced version of our previous wrist-worn NIRS wearable sensor. This device boasts wireless data communication and is specifically intended to detect hypoxia-driven opioid overdose. The system will incorporate a transimpedance amplifier (TIA) to transform the current outputs from the optical sensor into readable voltage for the microcontroller. Additionally, it will feature analog circuits and digital signal processing to refine the output signal, along with a set of circuits to smooth the output, obtaining feasible SNR outcomes.

Aim 3: Evaluation of the NIRS Wrist-Worn Wearable Sensor Using Brachial-Occlusion in Human Trials. Based on our previously approved IRB protocol from Purdue University's Institutional Review Board (Protocol # IRB-2020-297) for human trials (n=8), we will implement a conventional methodology to conduct non-invasive and safe brachial occlusion experiments. This will allow us to evaluate the performance of the NIRS sensor, developed in Aim 2, in detecting a hypoxia-driven opioid overdose. Through this methodology, our goal is to define a baseline for overdose detection, based on experimentally established thresholds for hypoxia ( $SpO_2 \sim <90\%$ ) during opioid-induced respiratory depression.



## Kansas

**Investigator:** Zijun Wang, PhD  
**Institution:** University of Kansas  
Lawrence, KS  
**Project Title:** Neuronal Circuits and Molecular Mechanisms Underlying Early Social Isolation-Potentiated Heroin Seeking  
**Research:** Basic Research  
**Research Area:** Substance Use Disorders, Early Life Adversity, Epigenetics, Brain Circuit, Electrophysiology, Bioinformatics  
**Earliest Start Date:** June 24, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Students with psychology, molecular biology, neuroscience, computer science, or related backgrounds are preferred. Prior research experience in rodent studies, molecular biology, bioinformatics, or computer programming is strongly preferred but not required.

**Project Description:** The summer intern will be involved in the research program examining the neuronal circuit and molecular mechanisms underlying early life stress-potentiated addiction vulnerability for opioids. This program will identify the early life stress-induced changes in neuronal connectivity within the brain reward pathway, and how these changes lead to later vulnerability for opioid addiction (e.g., heroin addiction). Moreover, this program also aims to understand what molecular changes are responsible for the early life stress-induced susceptibility for addiction, such as changes in chromatin accessibility and transcriptional profile. The summer intern will have the chance to learn multi-disciplinary and cutting-edge approaches and take on independent research projects.

## Kentucky

Investigator: Brittany Smith, PhD  
Institution: Northern Kentucky University  
Highlands Hight, KY  
Project Title: Executive Function in Opioid-Exposed Offspring and Subsequent  
Molecular Signatures  
Research: Behavioral Research  
Research Area: Neuroscience  
Earliest Start Date: May 8, 2024  
Housing: On-Campus

**Student Qualifications:** No prior experience needed but willingness to handle mice and/or coursework in biology or neuroscience strongly preferred.

**Project Description:** The project is centered on using a mouse model of prenatal opioid exposure to understand how opioid exposure during pregnancy affects the development of social behavior and cognition in the offspring. The goal is to identify cellular and molecular mechanisms for the behavioral outcomes and apply functional manipulations to prevent these changes due to the opioids. The exact project within this overall goal is flexible based on the candidate's interests, ranging from purely animal behavioral work, to cellular and molecular benchwork, microscopy, or a combination of these different focuses.

# Kentucky

Investigator: Justin Yates, PhD  
 Institution: Northern Kentucky University  
 Highland Heights, KY  
 Project Title: Contribution Of BLA-mPFC Pathway to Risky Choice and Compulsive Cocaine Seeking  
 Research: Basic Research  
 Research Area: Addiction, Cocaine Self-Administration, Compulsive Drug Seeking, Resurgence of Cocaine Seeking, Chemogenetics, DREADDs, Risky Decision Making, Rats  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** The research intern should be a major in one of the following areas: Neuroscience, Psychology, and/or Biology. Students who are interested in graduate degrees in neuroscience and/or psychopharmacology are well suited for the current research program. The research intern must be comfortable working with live rodents (specifically, Sprague Dawley rats). The research intern will also have the opportunity to section brains using a cryostat.

**Project Description:** The research project aims to determine how chemogenetic inhibition of the medial prefrontal cortex (mPFC)-basolateral amygdala (BLA) pathway alters compulsive cocaine seeking. After rats have acclimated to the lab for 7 days, they will be implanted with an indwelling catheter in the right jugular vein and will receive viral vector infusions into mPFC and BLA. One group of rats will receive bilateral viral vector infusion of AAV8-hSyn-DIO-hM4D(Gi)-mCherry in mPFC and AAVrg-hSyn-HI-enhanced green fluorescent protein(eGFP)-Cre (AAVrg-Cre) in BLA. One group will receive viral vector infusion of AAV8-hSyn-DIO-mCherry in mPFC and AAVrg-Cre in BLA (viral vector control). Additional groups will be used in which AAV8-hSyn-DIO-hM4D(Gi)-mCherry/AAV8-hSyn-DIO-mCherry will be infused in BLA, and AAVrg-Cre will be infused in mPFC. These conditions will allow the research team to determine if compulsive drug seeking is mediated by top-down control of BLA by mPFC or bottom-up control of mPFC by BLA.

Following 5-7 days of recovery, rats will be trained to self-administer 0.1% saccharin (50 µl delivered over 2.95 s). During saccharin self-administration, the response requirement will increase across sessions from an FR 1 to a variable interval (VI) 10-s schedule. Once rats have acquired saccharin self-administration, responses will be reinforced with intravenous infusions of cocaine (0.25 mg/kg/infusion) according to a VI 10-s schedule of reinforcement. The aperture that was associated with saccharin reinforcement will be paired with cocaine infusions. Rats will receive 7-10 sessions of drug self-administration. Rats will then be trained in a seeking-taking task, which will consist of 10 trials or 1 hr, whichever occurs first. The first part of the trial is the seeking chain. The previously inactive aperture (now the seeking aperture) will become illuminated. Completing the response requirement (VI 10-s schedule)

will result in illumination of the other aperture (taking aperture). The light in the seeking aperture will be extinguished. A single response in the taking aperture (FR 1 schedule) will result in an intravenous infusion of cocaine (0.25 mg/kg/infusion). Following 5 baseline sessions, rats will begin to receive probabilistic foot shock (0.4 mA across 1 s with a probability of 0.5) for completing each seeking chain. Rats will be able to receive a cocaine infusion during the taking chain even after receiving a foot shock following completion of the seeking chain. After 3-5 sessions, rats will receive an injection of deschloroclozapine (DCZ) (0, 1, or 3 µg/kg) 30 min before the seeking-taking session. Each dose will be administered in a counterbalanced fashion every 4 days.

At the end of the experiment (within 1-3 days following the final self-administration session), rats will be injected with either DCZ (3 µg/kg) or vehicle approximately 90 min before being deeply anesthetized with a combination of ketamine (100 mg/kg) and xylazine (10 mg/kg) (i.p.) before being transcardially perfused. Brains will be extracted and post fixed in 4% PFA for 24 hr at 4°C before being transferred to a solution containing 30% sucrose and 0.1% sodium azide for cryoprotection until being processed for cFos and virus expression. Brains will be coronally sectioned at 40 µm in a Leica cryostat. Brain sections will be stored in PBS and 0.1% sodium azide until immunofluorescent labeling. Tissue sections will be washed 3 times in PBS for 5 min each. Sections will then be exposed to PBS and 0.4% Triton-X for 30 min. Sections will then be washed in a blocking buffer containing PBS, 0.2% Triton-X, and 10% normal donkey serum for 1 hr. before being incubated overnight at 4°C in the blocking buffer and the primary antibodies (rabbit anti-cFos [1:1000 dilution], chicken anti-mCherry [1:3000 dilution], and rabbit anti-Green Fluorescent Protein [1:1000]). Sections will be washed 10 times in PBS for 1 min each before being incubated for 2 hr in the blocking buffer and secondary antibodies (anti-chicken Alexa-594 [1:1000 dilution], goat anti-rabbit Alexa-647 [1:1000 dilution], and goat anti-mouse Alexa-488 [1:1000 dilution]). Sections will be washed 3 times in PBS for 10 min before being stored in PBS and 0.1% sodium azide. Finally, sections will be mounted on microscope slides and coverslipped using ProLong Gold anti-fade mounting media with 4',6-diamidino-2-phenylindole (DAPI). Brain sections will be imaged using a Nikon confocal microscope.

## Kentucky

**Investigator:** Cassandra Gipson-Reichardt, PhD  
**Institution:** University of Kentucky  
Lexington, KY  
**Project Title:** Neurobehavioral Mechanisms Underlying Xylazine and Fentanyl Co-Use and Withdrawal  
**Research:** Basic Research  
**Research Area:** Xylazine, Fentanyl, Self-Administration, Kinome, Chemogenetics, Neural Circuits, Electrophysiology  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Preferred (but not required) skills include rodent handling, career interest in addiction neuroscience, and a major in areas such as biology, chemistry, psychology, or similar. Interns will directly work with rats and brain tissue samples. Career goals of post-undergraduate education are preferred.

**Project Description:** The project that the summer intern will be conducting involves evaluating the role of neuroinflammatory signaling and microglia in the reward pathway in driving nicotine relapse. This project will involve learning nicotine self-administration in rats, as well as learning how to maintain a breeding colony of rats that express a gene that allows for specific targeting of microglia (called CX3CR1-Cre rats). These rats are used in the technique "chemogenetics", which allows for directly activating or inhibiting microglia within the nucleus accumbens, a brain region heavily involved in nicotine addiction. The intern will learn surgical techniques such as intravenous jugular catheter placement, stereotaxic surgery, intracranial viral administration, as well as self-administration behavior, immunohistochemistry, confocal microscopy, and will be given the opportunity to learn about whole cell patch clamp electrophysiology.

## Kentucky

**Investigator:** Ilhem Messaoudi, PhD  
**Institution:** University of Kentucky  
Lexington, KY  
**Project Title:** POPI: Placenta, Opioids and Perinatal Implications  
**Research:** Basic Research  
**Research Area:** Opioid Use Disorder, Pregnancy, Maternal-Fetal Health, Neonatal Health, Placenta, Immunity, Inflammation  
**Earliest Start Date:** May 31, 2024  
**Housing:** On-Campus

**Student Qualifications:** An intern with some basic wet lab skills is preferred. The project requires working with human blood and tissues.

**Project Description:** The intern will participate in a maternal-fetal research project investigating how maternal opioid use disorder modulates the immune clock of pregnancy and affects the offspring immune system. A successful pregnancy requires carefully coordinated changes in the immune system that facilitate placentation, promote fetal tolerance and growth, and induce labor. Deviations from this tightly regulated “pregnancy immune clock” due to maternal opioid use can lead to significant adverse health outcomes for the pregnant person and the offspring including complications during labor, preterm birth, and neonatal opioid withdrawal syndrome. The project hypothesis is that maternal opioid use leads to low grade inflammation that results in altered placenta health and impaired immune phenotype and function in the offspring. To test this hypothesis, the goals of the project are to compare, at delivery, placenta tissues from opioid-naïve mothers and mothers with opioid use disorder, as well as plasma and immune cells from their respective infants. The intern will learn key basic lab techniques that are routinely used in serology or molecular biology.

## Kentucky

**Investigator:** Kristen Gullo  
**Institution:** USWorldMeds  
Louisville, KY  
**Project Title:** Accelerated Development of Lofexidine for Neonatal Opioid Withdrawal Syndrome  
**Research:** Drug Development Research  
**Research Area:** Neonatal Opioid Withdrawal Syndrome, Neonatal Abstinence Syndrome, Pediatric Formulation Development, Clinical Trial Material Manufacturing, Phase 2, Efficacy, Safety, Pharmacokinetics, Regulatory  
**Earliest Start Date:** May 15, 2024  
**Housing:** On-Campus

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

**Project Description:** US WorldMeds is developing a non-opioid product for the treatment of Neonatal Opioid Withdrawal Syndrome (NOWS). A Phase 2 study in neonatal patients is currently enrolling to evaluate pharmacokinetics, safety, and efficacy of the new therapy. Additionally, transfer of the manufacturing process for the new product will be underway to produce material for a subsequent Phase 3 study to support new drug registration. Intern(s) will be placed with mentors responsible for the executional oversight of one or more of these development program components. The intern will participate in a number of activities to learn about drug development requirements, assist with documents, perform literature reviews, compile resources and/or data required for program decisions, support vendor communications and compliance oversight, tabulate and trend data, support internal cross-functional meetings to align research activities across stakeholders, and provide organizational and/or writing assistance with regulatory communications required under an Investigational New Drug Application.

# Louisiana

Investigator: Ethan Michael Anderson, PhD  
 Institution: Louisiana State University  
 Baton Rouge, LA  
 Project Title: Targeting Phospholipase C and Dendritic Spines to Reduce Cocaine and Heroin Motivation  
 Research: Basic Research  
 Research Area: Heroin, Cocaine, BDNF, TrkB, PLCg1, PLCgamma1, Phospholipase C, Self-Administration, Reinstatement, Relapse, Drug-Seeking, Rodent Models, Viral Vectors, AAV, LV, Dendritic Spines, shRNA, Rat Handling, Overexpression, Knockdown, Cre-Recombinase, Transgenic Rodents  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** The minimum skill set is curiosity and a willingness to learn! Basic computer skills including Word and Excel are needed as well. Preferred skill sets will be previous work with animals, previous work with surgeries, and basic lab skills like pipetting. Knowledge of PCR, qPCR, and/or western blotting is preferred too.

**Project Description:** The Anderson Lab studies rodent models of substance use disorder (SUDs). Currently, we are most interested in understanding the role of the cell signaling protein PLCgamma1 in the nucleus accumbens (NAc), an important brain region for reward and addiction. PLCgamma1 is downstream of BDNF-TrkB signaling and is found in the synapses of neurons in the accumbens. PLCgamma1 activity is altered by several addictive drugs, and we recently showed that overexpressing this protein in the nucleus accumbens using AAV viral vectors can reduce cocaine-taking behavior and heroin-seeking behavior. Thus, understanding how PLCgamma1 acts in the accumbens could pave the way for future treatments for SUD.

The immediate goals of this project are to understand the neuronal cell types that PLCgamma1 acts in to produce its anti-addictive effects and to understand which downstream proteins it acts with to produce these effects. The procedures used will be in vivo stereotactic surgeries to inject AAV vectors into the nucleus accumbens, rat heroin self-administration, and rat sucrose self-administration. qPCR and/or western blot, and various other wet lab procedures.



# Louisiana

Investigator: Julia Buckner, PhD  
 Institution: Louisiana State University  
 Baton Rouge, LA  
 Project Title: Ecological Momentary Assessment of Racial/Ethnic  
 Microaggressions and Cannabis Use among Black Adults  
 Research: Behavioral Research  
 Research Area: Black Adults, African American, Cannabis, Ecological Momentary  
 Assessment, Racism, Discrimination, Microaggressions, Mental  
 Health  
 Earliest Start Date: May 13, 2024  
 Housing: Off-Campus

**Student Qualifications:** At least 2 years of coursework in psychology or related field, at least 1 year of experience conducting psychological research or related field. Career interests that include pursuing graduate work in clinical psychology or related field and career interests that include explicit focus on work with underrepresented/marginalized groups, especially African American/Black individuals. Internship will require work with Black adults who use cannabis.

**Project Description:** Black individuals are the second largest racial minority group in the U.S., accounting for over 13% (44 million) of the population.<sup>1</sup> Black individuals evince numerous health inequalities, particularly as it relates to cannabis use and related problems – e.g., Black individuals who use cannabis more frequently<sup>2</sup> and are more likely to use riskier cannabis use methods (e.g., blunts;<sup>3</sup>), associated with greater exposure to carcinogens and toxins<sup>4</sup> and with greater risk for cannabis use disorder (CUD;<sup>5,6</sup>). In fact, Black individuals who use cannabis are more likely to meet criteria for CUD than White or Hispanic/Latin persons.<sup>2,7</sup> This is concerning given rates of cannabis use (including daily use) appear to be increasing among Black adults in the U.S.<sup>8</sup>

Minority stress-based models of substance use and mental health outcomes propose that marginalized groups, such as Black Americans, are vulnerable to risky substance use via the interplay of several domains including interpersonal (e.g., experiences of discrimination) and individual factors (e.g., emotional symptoms).<sup>9</sup> Yet, despite meta-analytic data indicating that racial discrimination (a source of significant minority stress) is positively related to adverse drinking outcomes among Black individuals,<sup>10</sup> the impact of racial discrimination on cannabis use behavior among Black individuals has received little empirical attention. Further, it remains unknown to what extent stressors such as these predict cannabis use and related problems at the proximal level. Although Black persons in the U.S. experience more frequent race-based discrimination than other races/ethnicities<sup>11,12</sup>, the degree to which experiences of discrimination proximally predict cannabis use is understudied. Further, much less is known about racial/ethnic microaggressions (MAs), defined as intentional or unintentional verbal, behavioral, or environmental indignities that denigrate people because of their race/ethnicity<sup>13</sup>, which occur more frequently than overt discrimination.<sup>14</sup> Yet outside of our

pilot work, there is almost no published research on the impact of MAs on cannabis use. Thus, there is a need to understand the longitudinal nature of MAs and cannabis use motivation (i.e., greater cannabis craving, intention to use, coping-oriented motives for cannabis use) and cannabis use and related problems among this population.

Before knowledge regarding MAs can be effectively leveraged to improve culturally appropriate, person-focused care among Black individuals, critical gaps in knowledge need to be addressed. First, prospective investigation is necessary to establish if MAs predict cannabis use motivation and risky cannabis use among Black individuals, above and beyond non-discriminatory daily stressors and overt racial discrimination. Second, mechanisms by which MAs affect cannabis use motivation and cannabis use and related problems are not well understood. For example, MAs might have a direct impact on cannabis misuse or may have an indirect effect through MA-associated negative affect (NA).<sup>15</sup> Yet, no known studies have tested whether MA-related NA is proximally related to cannabis outcomes. Third, the factors that make Black individuals more resilient to the experience of MAs are unknown. Cultural factors, including religiosity, ethnic-racial identity (ERI), and positive coping in response to discrimination might increase resilience to cannabis misuse following exposure to MAs. For example, higher levels of religiosity may protect Black persons from cannabis use<sup>16,17</sup> to manage distress associated with MA, whereas greater ERI appears to be related to less cannabis use<sup>18,19</sup> which may decrease likelihood to use cannabis in response to MA. Positive coping with discrimination<sup>20,21</sup> may also be protective.

Our goal is to elucidate the distinct role of MAs in cannabis use motivation and cannabis use and related problems directly and indirectly via NA among Black adults with regular cannabis use using ecological momentary assessment (EMA) over 21 days. Notably, the proposed project is in line with NIH's UNITE initiative's aim to support "new research on health disparities, minority health, and health equity." Participants (N=100; 50% female) will be Black adults with current regular cannabis use (15+ times in past month). The following aims will be tested:

#### Aims 1. Longitudinal Relations

A.1.a. To examine the influence of MAs on cannabis use motivation. The effect of MAs on (a) cannabis craving, (b) intention to use, and (c) coping-oriented motives for cannabis use over the course of 21 days will be distinct from, and more impactful than, non-discriminatory daily stressors and overt racial discrimination.

A.1.b. To examine the influence of MAs on cannabis use/problems. The effect of MAs on (a) cannabis use, (b) cannabis use frequency, (c) quantity of cannabis used, and (d) cannabis-related problems 21 days will be distinct from, and more impactful than, non-discriminatory daily stressors and overt racial discrimination.

#### Aim 2. Mechanisms

A.2.a. To examine mechanisms through which MAs affect cannabis use and use-related motivation. There will be an indirect effect of MAs through NA, anxiety sensitivity, and coping motives for the dependent variables listed in A.1.a. and A.1.b.

#### Aim 3. Exploratory Test of Moderators

A.3.a. To assess risk and resilience factors to MAs. Black persons with greater religiosity, ERI, and positive coping will experience lower cannabis use motivation and less cannabis use and related problems.

# Massachusetts

Investigator: Sabrina Assoumou, MD, MPH  
 Institution: Boston Medical Center  
 Boston, MA  
 Project Title: PrEP and MOUD Rapid Access for Persons who Inject Drugs: the CHORUS+ Study  
 Research: Clinical Research  
 Research Area: People who Inject Drugs (PWID), HIV, HIV Prevention, Clinical Research, Substance Use Disorder, PrEP  
 Earliest Start Date: May 27, 2024  
 Housing: Off-Campus

## Student Qualifications:

- Interest in public health, health economics, health equity, substance use disorders, and/or data driven research
- Academic background in psychology, public health, health sciences/services, epidemiology, or related field
- Excellent oral and written skills
- Ability to handle multiple responsibilities simultaneously and prioritize accordingly
- Excellent interpersonal skills
- Must have an interest in performing new and varied work assignments
- Must have the ability to maintain confidentiality
- Eager to contribute to an inclusive environment and be able to adhere to BMC core values and ethics

Please note the following about housing:

\* There are resources through Boston University to find summer housing, including a program where they place students in shared affordable housing, however, this program has an application deadline in April and may not be possible with the internship timeline. However, there are many other housing/sublet options and advice advertised through the BU housing website for finding housing in the Boston area in general. We are happy to point interns in that direction, as needed.

**Project Description:** The summer intern will be working on a project aimed at expanding HIV prevention tools to persons who use drugs.

HIV cases have increased among persons who use drugs (PWUD) during the US overdose crisis. Diagnostic tools such as HIV self-testing (HIVST) have the potential to contribute to efforts to reach Ending the HIV Epidemic in the US (EHE) goals. Although HIVST was initially hailed as a potential “game-changer” when approved in 2012, it has been underutilized, especially among PWUD. The goal of the current study is to evaluate if HIVST could be used to

expedite access to HIV pre-exposure prophylaxis (PrEP), a biomedical approach shown to be effective at preventing HIV among persons who use drugs.

# Massachusetts

**Investigator:** Benjamin Linas, MD  
**Institution:** Boston Medical Center  
Boston, MA  
**Project Title:** Health Economics of Substance Use Disorder, HCV, and HIV  
Treatment: Evaluating Intervention Outcomes for Individuals,  
Systems, and Communities  
**Research:** Epidemiology Research  
**Research Area:** Public Health, Health Equity, Social Determinants of Health,  
Health Economics, Health Policy, Substance Use Disorder, HIV,  
HCV  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

## **Student Qualifications:**

- Interest in public health, health equity, substance use disorders, data-driven research, and/or health economics.
- Academic background in public health, health sciences/services, epidemiology, or related field
- Ability to handle multiple responsibilities simultaneously and prioritize accordingly.
- Excellent interpersonal skills
- Must have an interest in performing new and varied work assignments.
- Must have the ability to maintain confidentiality.
- Eager to contribute to an inclusive environment and be able to adhere to BMC core values and ethics.

**Project Description:** The summer intern will be working on projects related to the Center for Health Economics of Treatment Interventions for Substance Use Disorder, HCV, and HIV (CHERISH), a NIDA National Center of Excellence for health economic research related to substance use disorder policy and HCV and HIV care of people who use substances. CHERISH is a multi-institutional center focused on developing and disseminating health economic research on healthcare utilization, health outcomes, and health-related behaviors that informs substance use disorder treatment policy and HCV and HIV care of people who use substances. A NIDA summer intern with this project will support novel work to investigate interactions between social determinants of health and outcomes for substance use disorder, HCV, and HIV.

# Massachusetts

**Investigator:** Maureen Stewart, PhD  
**Institution:** Brandeis University  
 Waltham, MA  
**Project Title:** Examining Opioid Use Disorder Treatment in Medicaid Managed Care Plans: Policies and Outcomes  
**Research:** Other Research  
**Research Area:** Health Services Research, Substance Use Treatment Services, Quality of Care, Medicaid Managed Care  
**Earliest Start Date:** May 20, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The intern must have strong written, communication, and organizational skills, must be detailed-oriented, and able to work independently. The intern must also be skilled in using standard computer programs (e.g., Microsoft Word, Excel, PowerPoint) and have familiarity with or be willing to learn presentation software and other research tools. Degree or course work in a related field is preferred (e.g., health policy, public health, social work, health economics).

**Project Description:** State Medicaid programs provide health insurance coverage to low-income people and those with disabilities, but most states contract with managed care organizations to administer or manage Medicaid benefits. These Medicaid health plans have broad discretion about what they cover and how they manage services. Eighty-four percent of Medicaid enrollees are covered by a Medicaid Health Plan and people with opioid use disorder (OUD) are more likely to have Medicaid coverage. Although Medicaid health plans are subject to state guidelines, they have leeway in several areas, for example, to create their own provider networks and establish their own payment policies. This study is the first to examine how this variation may affect Medicaid patients' access to quality addiction services.

The research team is conducting a national survey of Medicaid health plans (MHPs) and linking their responses to national data on health plan quality and to patient-level Medicaid data from several states to examine outcomes. The specific study aims are to 1) Describe Medicaid health plan OUD treatment policies (e.g., coverage requirements, utilization management, network design, payment, and innovative care approaches) across MHPs that contract with 50 states and the District of Columbia and identify state policies, market and plan characteristics associated with OUD treatment policies. 2) Evaluate the relationship between Medicaid health plans' OUD treatment policies and plan-level rates of enrollee access to and quality of OUD treatment. 3) Evaluate the relationship between Medicaid health plans' OUD treatment policies and patient-level outcomes of OUD treatment (e.g., pharmacotherapy duration, overdose).

Findings will provide valuable information regarding access to and effectiveness of SUD treatment in Medicaid health plans. This information can be used by plan administrators as

they develop and implement plan policies, state Medicaid directors as they contract with Medicaid health plans, and federal policy makers making determinations about use of Medicaid waivers and other efforts to address opioid use disorders in the US.

## Massachusetts

**Investigator:** Peter Chai, MD  
**Institution:** Brigham and Women's Hospital  
Boston, MA  
**Project Title:** Smart Steps: A Context-Aware Adherence Intervention to Improve Prep Adherence Among Men Who Have Sex with Men (MSM) With Substance Use Disorder  
**Research:** Behavioral Research  
**Research Area:** Ingestible Sensors, Medication Adherence, HIV Prevention, Technology-Based Interventions, mHealth, Adherence, Interventions, Substance Use Disorder  
**Earliest Start Date:** July 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Ideal interns will have had basic training in institutional review board and regulatory training for human clinical trials. Interns should also have previous experience conducting qualitative analysis and interviews and be comfortable assisting with computer interface programming and basic laboratory work (pipette skills). The intern would also have interest in HIV treatment/prevention and substance use and plan to pursue postgraduate training either in medical school or a doctoral program.

**Project Description:** The present grant develops a digital pill system comprising an ingestible radiofrequency sensor linked to a gelatin capsule that over-encapsulates study medication. Ingestion of this digital pill activates the radiofrequency sensor which transmits data surrounding ingestion time to a wearable off-body Reader device. This device stores and forwards ingestion data to a participant's smartphone enabling real-time assessment of adherence. The study develops an antecedent behavioral intervention based on smartphone digital phenotyping to anticipate contexts in life when people may experience PrEP nonadherence and in turn, deliver messages to mitigate PrEP nonadherence.



# Massachusetts

Investigator: Suena Massey, MD  
 Institution: Brigham and Women's Hospital  
 Boston, MA  
 Project Title: Elucidating Mechanisms of Pregnancy's Protective Effect on  
 Drug Abuse Using Integrated Data Analysis  
 Research: Epidemiology Research  
 Research Area: Pregnancy, Smoking, Substance Use, Protective Factors,  
 Biomarkers, Developmental Processes, Social Processes,  
 Attachment, Mentalization, Sex Differences, Quasi-Experimental  
 Designs, Integrated Data Analysis, Meta-Analysis, Secondary  
 Data Analysis, Mixed Methods Research, Within-Family Designs  
 Earliest Start Date: May 20, 2024  
 Housing: Off-Campus

**Student Qualifications:** This experience is optimally suited to individuals with a preexisting interest in maternal or perinatal mental health, changes in substance use over time, or obstetric/birth outcomes related to these factors. This could include a variety of undergraduate majors and past personal and professional experiences. The PI will work with the intern(s) to carve out a meaningful, yet realistic project matched to the intern's interest and prior research experience. Interns will be encouraged to and expected to collaborate with the PI's team past the end of the summer if obtaining a coauthored peer-reviewed publication derived from the project is desired. The research will primarily involve secondary analysis of existing data (quantitative and qualitative) from multiple longitudinal studies of pregnant women. Some of these cohorts are oversampled for smoking during pregnancy; others are derived from a parent-offspring adoption study.

**Project Description:** The protective effect of pregnancy on women's substance use is a common understudied phenomenon illustrating the temporary interruption of addictive processes by yet-to-be-identified processes in the absence of treatment. Identifying underlying mechanisms would provide novel insights into how addictive processes could be more effectively disrupted and prevented in non-pregnant women and men. This project repurposes multiple existing longitudinal pregnancy cohorts with unique features to accomplish the aims which are to:

1. Utilize a within-person design to estimate the unique "effect" of pregnancy, and salient events of pregnancy, on smoking behavior within a single pregnancy.
2. Isolate and estimate the impact of general and parenting-related developmental influences on smoking by examining between-pregnancy differences in a subset of women who were assessed on two of their own pregnancies.
3. Examine the role of prenatal parental reflective functioning (coded from existing gold-standard qualitative interviews conducted in the second trimester) in pregnancy's protective effect on smoking.

4. Explore the relevance of found mechanisms from aims 1-3 for other substances and combination of substances.

# Massachusetts

Investigator: Lauren Moran, MD, MPH  
 Institution: Brigham and Women's Hospital  
 Boston, MA  
 Project Title: Impact of Prescription Stimulants on the Drug Overdose  
 Epidemic  
 Research: Epidemiology Research  
 Research Area: Prescription Stimulant, Methamphetamine, Cocaine, Overdose  
 Earliest Start Date: June 24, 2024  
 Housing: On-Campus

**Student Qualifications:** The fellowship program is best suited for rising senior undergraduate students with an interest in public health, epidemiology, medicine, pharmacy, biostatistics and/or health services research and policy, who are enrolled in a four-year degree program and who self-identify as Black/African American, Native American, Alaskan Native and/or Hispanic/Latinx. Prior research experience is not required, but applicants must be able to convey an interest in research and how this program will help them to achieve their long-term career goals. Quantitative coursework, skills, or experience is preferred, but not required. The NIDA intern will be incorporated into the ongoing BWH summer internship with other college undergraduates and will have the same start date and housing as other interns. The start date will be determined/finalized in the spring of 2024. (The intern will have housing at a nearby MA college, in walking distance from division, with other interns at cost of \$3100. The BWH Division will reimburse the intern for \$600 more than NIDA \$2500 housing reimbursement.)

**Project Description:** Healthcare research databases used for large epidemiologic studies, such as insurance claims data, rely on diagnosis codes to identify overdose events or urgent encounters related to substance use disorders. There are no diagnostic codes for methamphetamine, only non-specific codes for "Other stimulant" which could be due to prescription stimulants, methamphetamine, or other stimulants. The purpose of the project is to use electronic health record data to identify individuals with methamphetamine use disorder and identify associated data (urine toxicology results, admitting diagnosis) with goal of developing a valid definition of methamphetamine use disorder using claims data. Another alternative project would be to develop a database of prior authorization policies for prescription stimulants, as some insurance companies require prior authorization for high dose stimulant use.

## Massachusetts

Investigator: Joji Suzuki, MD  
Institution: Brigham and Women's Hospital  
Boston, MA  
Project Title: Oral Buprenorphine as a Novel Low-Dose Induction Strategy  
Research: Clinical Research  
Research Area: Opioid Use Disorder, Buprenorphine, Pharmacokinetics, Low-Dose Induction  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** We are open to a range of applicants, but prefer those individuals interested in clinical research. We do not conduct any animal research or work with tissue samples.

**Project Description:** The student intern will assist the PI and the lab in the conduct of a variety of NIDA-funded research projects to gain first-hand experience in clinical research. We are conducting primarily clinical trials of novel pharmacologic and psychosocial interventions for opioid use disorder, but also studies to identify novel low-dose induction strategies with buprenorphine, and to elucidate if there are any dental complications from the use of sublingual buprenorphine. We are eager to mentor students who want to gain more experience in this line of research.

# Massachusetts

Investigator: Bettina Hoepfner, PhD  
 Institution: Massachusetts General Hospital  
 Boston, MA  
 Project Title: Planning Grant for a Multi-Site Trial to Examine the Effectiveness of Recovery Community Centers Serving Black Communities to Support Persons Using Medications for Opioid Use Disorder  
 Research: Clinical Research  
 Research Area: Recovery, Systems of Care, Opioid Use Disorder, Recovery Community Centers  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** We are an ideal mentoring site for undergraduates interesting in pursuing a doctoral degree in psychology or related area. Thus, we prefer interns who have shown some prior interest in psychology and/or public health. Interest in recovery from addiction and recovery-oriented systems of care would be ideal but is by no means required. Training will focus on survey methodology, qualitative data collection and analysis, lit reviews, and data management skills.

**Project Description:** The summer intern will participate in ongoing projects of our R24 project, which seeks to advance the science on recovery community centers (RCC), and the related R34 project. RCCs are centers located in the heart of communities that are intended to be visible, easily accessible venues that provide recovery support to people recovering from substance use disorder. This support consists of providing services or linkage to services not provided in typical clinical settings. The goal is to increase recovery capital (employment/training, housing, recovery-specific social support) and, thereby, the chances of stable remission and recovery. Our R24 project will engage RCC stakeholders (e.g., patients, RCC leadership, clinicians, advocates, scientists) in research advancing activities. The intern will support these activities (e.g., seminar series, hands-on research support for RCCs) while gaining insight into what RCCs are and how they operate. The intern's project (i.e., topic of presentation at end of internship) will either focus on an active collaboration between our R24 team and a specific RCC or group of RCCs or will take the form of a summary report in line with the R24 goals (e.g., collated scales for measuring recovery), depending on where things are at during the summer of 2024.

# Massachusetts

Investigator: Alex Shalek, PhD  
 Institution: Massachusetts Institute of Technology  
 Cambridge, MA  
 Project Title: Defining the Impact of Drug Use on Immune Function and Fitness Against HIV-1  
 Research: Basic Research  
 Research Area: Single Cell RNA Sequencing, Epigenetics, Transcriptomics, Immunity, Bioinformatics  
 Earliest Start Date: June 1, 2024  
 Housing: Off-Campus

## **Student Qualifications:** Education Requirements:

- Enrolled in a minimum of a bachelor's degree program in Biological Sciences, Engineering, Computer Science, or a related field of study.

## **Preferred Intern Qualifications:**

- Interest in learning bioinformatic tools for sequencing analysis
- Interest in pursuing a career or higher education (MS or PhD) in cell biology, immunology, bioinformatics, computer science or any other related field.
- Specific skill sets vital for success in this internship could include one or more of the following: experience with R or Python programming languages, analysis of genomics datasets, analysis of other high-throughput screening modalities.

**Project Description:** Current prevention and cure strategies in development for persons (co)-infected with HCV/HIV-1 rely on fundamental assumptions about baseline immune function and composition that do not consider potential dysfunction associated with opioid use. To develop effective prophylactics and therapeutics against HIV-1 and other infections for individuals with opioid/polysubstance use disorders (OUD/PSUD), a cellular and molecular understanding of how OUD/PSUD impacts the immune system is much needed. Towards these goals, this project aims to address the following questions:

- (1) Is immune function in the blood in individuals with OUD/PSUD altered in relation to a control cohort, or do non-immune changes dominate (hepatic metabolism, innate gut immunity)?
- (2) Is immune dysfunction due to HIV-1/HCV (co)-infection and OUD/PSUD associated with distinct changes in cellular immune states and phenotypes?
- (3) Are there molecular pathways, biological agents, or physiological alterations in OUD/PSUD that can be causally identified to impact HIV-1 and additional pathogen infectivity, or HIV-1 mediated dysfunction?

To elucidate the cellular and molecular dysfunction associated with OUD/PSUD +/- HIV-1/HCV infection, next generation sequencing technologies such as single cell RNA-sequencing (scRNA-seq) are capable of unbiasedly characterizing complex phenotypes and molecular signatures associated with OUD/PSUD +/- HIV-1/HCV (co)-infection. Such methods now are

expanded to quantify other molecular measurements in individual cells including chromatin accessibility and protein expression, thus creating a holistic understanding of cell function. This project utilizes scRNA-seq to examine changes in immune function within peripheral blood mononuclear cells (PBMCs) in individuals with OUD/PSUD by comparing them to PBMCs from matched healthy donors. Additionally, data from dissociated single cell technologies including cellular indexing of transcriptomes and epitopes (CITE-seq) for surface protein quantification and the assay of transposase accessible chromatin (ATAC-seq) to determine chromatin accessibility across the human genome has been generated for this cohort.

## Massachusetts

**Investigator:** Julie M. McCarthy, PhD  
**Institution:** McLean Hospital / Harvard Medical School  
Belmont, MA  
**Project Title:** Improving Treatment Engagement in Individuals with Co-Occurring Substance Use and Psychosis: a Telemedicine Family-Based Approach  
**Research:** Clinical Research  
**Research Area:** Families, Substance Use, Psychosis, Intervention  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interns will have the opportunity to train in an ongoing NIDA clinical trial and have access to excellent resources through our academic medical center. We prioritize providing mentorship in professional development, training on co-occurring substance use and psychosis, responsible conduct of research, and data analysis with a chance to lead their own project using qualitative and quantitative data from family coaching sessions and assessments that could lead to a poster or publication.

**Project Description:** Dr. McCarthy's team is developing and evaluating a new telehealth intervention for families of people with early psychosis and substance use. Co-occurring substance use is related to poor treatment outcomes, and our program is designed to help families support a loved one to increase their readiness to change their substance use and improve overall wellbeing of the family through one-on-one coaching. We are interested in understanding what works well for families, what are their challenges, and how we can overcome them through research.



## Massachusetts

**Investigator:** Rebecca Kathryn McHugh, PhD  
**Institution:** McLean Hospital / Harvard Medical School  
Belmont, MA  
**Project Title:** The Role of Behavior Therapy Combined with Buprenorphine for Opioid Use Disorder  
**Research:** Clinical Research  
**Research Area:** Opioid Use Disorder, Behavior Therapy, Buprenorphine  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interns with an interest in human subjects' research or a clinical career in substance use disorders are encouraged to apply. Interest in data analysis is preferred, but not required. Backgrounds in any area of psychology, neuroscience, pre-med, or related disciplines are welcome.

**Project Description:** The major goal of this project is to investigate the effects of behavior therapy added to buprenorphine for opioid use disorder, including moderators of treatment response and the impact on functional outcomes. The project involves examining clinical trial data to better understand who may best respond to behavioral therapy and what outcomes are most impacted by behavioral therapy. Interns can have the opportunity to be involved in other projects in the area of opioid use disorder risk and treatments, such as a study examining the association between pain and opioid relapse.

# Massachusetts

Investigator: Camron Bryant, PhD  
 Institution: Northeastern University  
 Boston, MA  
 Project Title: A Reduced Complexity Cross In BALB/c Substrains to Identify the Genetic Basis of Oxycodone Dependence Phenotypes  
 Research: Basic Research  
 Research Area: QTL, Behavioral Genetics, Opioid, Opiate, Cocaine, Methamphetamine, IVSA, Intravenous Self-Administration, Impulsivity, Compulsivity, Withdrawal, Reward, Conditioned Place Preference, Anxiety, Elevated Plus Maze, RNA-Seq, Transcriptome, Gene Expression, Naloxone, Naltrexone, Conditioned Place Aversion, Addiction Liability, Spliceome, Splice Variants, Binge Eating, Food Addiction, Reward, Translational Genetics, Reinforcement, Intermediate Phenotype, Systems Genetics, Eqtl, QTL, GWAS, Genome-Wide, Gene Editing, Genome Editing, CRISPR, RNA Binding Protein, RBP, CLIP, Self-Administration, ICSS, Intracranial Self-Stimulation, Substance Use Disorders, Neonatal Abstinence Syndrome, Genetic, Proteomic, Proteomics, AAV, Causal Variant, Addiction Liability, Therapeutic, Drug Targets, Rats, Mice, Schedule-Induced Polydipsia, DRL  
 Earliest Start Date: June 10, 2024  
 Housing: On-Campus

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

**Project Description:** Substance abuse disorders are heritable psychiatric conditions whose genetic basis remains largely unknown. Mammalian model organisms offer a powerful, complementary tool for accelerating the discovery of novel genetic factors and neurobiological mechanisms in humans. The Laboratory of Addiction Genetics integrates classical forward genetics in mice with contemporary genome editing and transcriptomics to understanding the mechanisms that confer susceptibility versus resistance toward the addictions. We are committed to the development and refinement of behavioral models across multiple abused substances that most directly gauge the contribution of natural genetic variation to behavior and bridging these discoveries with -omics and molecular genetics to validate candidate genes, functional variants, and neurobiological mechanisms. This multi-pronged approach leverages our ability to make discoveries that could translate to

new pharmacotherapeutic avenues for treatment and prevention. Potential activities for the trainee could include video tracking and data curation for quantitative genetic analysis and training in running the R package R/qtl for various behavioral traits. Additional training includes DNA extractions and real-time quantitative PCR for measuring gene expression of candidate genes and immunoblotting for measuring protein levels. Pending prompt animal training and protocol approval, the student could also potentially be involved in running behavioral studies. For the rat U01 project, potential activities include similar opportunities for behavioral data collection/curation/analysis with additional behaviors such as cocaine acute locomotor stimulant sensitivity, sucrose preference, DRL task of impulsivity, schedule-induced polydipsia assay of compulsivity, survival surgeries for femoral vein implants for rat cocaine intravenous self-administration, running rats through cocaine intravenous self-administration.

## Massachusetts

Investigator: Gaurav Gaiha, MD, PhD  
Institution: Ragon Institute of Mass General, MIT and Harvard  
Boston, MA  
Project Title: Harnessing Highly Networked HLA-E Epitopes to Achieve a  
Broadly Effective HIV Cure  
Research: Drug Development Research  
Research Area: Vaccine Development, HIV, T cells, Immunology, Virology  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** Interns with hands on undergraduate research experience and skills of molecular cloning and cell culture would be preferred.

**Project Description:** The project would be to assist in the advancement of our efforts to develop a universal T cell vaccine for HIV to specifically help HIV+ patients with substance use disorder. This work would involve molecular cloning, cell culture, vaccine generation and potentially animal work if this student is interested in pursuing.

## Maryland

**Investigator:** Oluwaseun Falade-Nwulia, MBBS, MPH  
**Institution:** Johns Hopkins University  
Baltimore, MD  
**Project Title:** Ending the HIV Epidemic: Peer-Supported Collaborative Care for Mental Health and Substance Use Disorder Care Integration into HIV Care Settings  
**Research:** Clinical Research  
**Research Area:** Substance Use Disorder and Infectious Disease Care Integration, Peer Care Models, Social Network Research  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** This work will be of particular benefit to interns interested in addressing health care disparities for individuals with substance use disorders. The research does not require students to work with animals, humans or tissue samples,

**Project Description:** The summer intern will work on a research project focused on understanding the effectiveness of peer-based models for improving infectious disease care for patients with substance use disorders. He or she will be involved with data collection, analysis and writing up of study results evaluating the role of peer mentors in supporting integration of infectious disease and substance use disorder care.

# Maryland

Investigator: Kevin Wenzel, PhD  
Institution: Maryland Treatment Centers  
Baltimore, MD  
Project Title: Peer Recovery Support Services for Individuals in Recovery  
Residences on MOUD  
Research: Clinical Research  
Research Area: Medications for Opioid Use Disorder, Peer Recovery Coaching,  
Recovery Residences  
Earliest Start Date: May 6, 2024  
Housing: Off-Campus

## Student Qualifications:

- Interns should have an interest in a career in clinical research with human subjects and/or providing clinical services to humans. Many of our research assistants have a degree in psychology or related field.
- Interns should be flexible/adaptable, able to "think on their feet".
- Interns should be ready for a fast-paced environment that can be unpredictable at times.
- Our research does not involve working with animals or tissue samples.

**Project Description:** Medication based treatments are the gold standard for treating opioid use disorder; however, retention in treatment is very poor. This project aims to develop and test a peer-based intervention to increase adherence to medications for opioid use disorders (MOUD) among individuals living in recovery residences or in low intensity residential treatment. We are currently testing out peer intervention in a randomized controlled trial with a 6-month intervention period. We plan to collect data for 50 RCT subjects, half of whom will receive peer intervention aimed at increasing MOUD adherence.

# Maryland

Investigator: George Uhl, MD, PhD  
 Institution: University of Maryland / VA Maryland Healthcare System  
 Baltimore, MD  
 Project Title: PTPRD Phosphatase Inhibitors for Stimulant Use Disorders  
 Research: Drug Development Research  
 Research Area: Improving understanding of irreversible inhibitors, reversible inhibitors and positive allosteric modulators of the phosphatase of PTPRD, Developing pentilludin for aid in abstinence from stimulant use disorders, Developing flavanol-related PAMs for Alzheimer's disease neurofibrillary pathology (NIA supplement), Mouse models for roles of PTPRD in enhancing Alzheimer's disease neurofibrillary pathology, Molecular biologic/biochemical assays of phosphatase: IP<sub>3</sub> degrading and other PTPRD activities, Aid in setting up infrastructure for phase I studies of pentilludin in research volunteers  
 Earliest Start Date: January 2, 2024  
 Housing: Off-Campus

**Student Qualifications:** Ability to work for the whole summer. More academic experience is a plus. Ability to work independently.

**Project Description:** Several possibilities, depending on student experience and credentialing (e.g., earlier is better for VA credentialing)

- In vitro phosphatase assay learning/execution. Aid screening/characterization of novel PTPRD phosphatase ligands (reversible inhibitors, positive allosteric modulators)
- Mouse behavioral and immunochemical experiments. Aid studies of young and aging mice with toxicity of novel inhibitors and anti-AD activities of novel PAMs
- Aid establishment of fist in human/phase I with IRB, sample collection, and other antecedents to clinical trials

# Maryland

Investigator: Barbara Juarez, PhD  
 Institution: University of Maryland, Baltimore  
 Baltimore, MD  
 Project Title: Dopamine Circuit Regulation of Morphine Reinforcement across the Opioid Exposure Cycle  
 Research: Basic Research  
 Research Area: Neurophysiological Dissection the Functionally Diverse Dopamine System During Opioid Reward Learning. Mouse Behavior, Slice Electrophysiology, Slice 2-Photon Imaging, In Vivo Fiber Photometry, Viral Surgeries, CRISPR/Cas9 Gene Editing, Stress, Opioids, Opioid Withdrawal, Reward Learning, Dopamine, RNAscope  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Experience and comfort with handling mice would ensure a productive experience for the intern. Skill sets with mouse behavior or immunohistochemistry are preferred. Career interests can include either PhD or MD/PhD programs, a general scientific interest in neuroscience would help. Research will require working with animals (mice) and brain tissue from euthanized mice.

**Project Description:** Pathological adaptations in the ventral tegmental area (VTA) dopamine system associated with chronic exposure to opioids and opioid withdrawal can dysregulate responsivity to opioids and contextual cue associations. Foundational these studies have identified an indirect mechanism of VTA dopamine neurons by opioids; opioids (such as morphine) act on mu-opioid receptors (MORs) expressed on local VTA GABAergic interneurons and GABAergic axon terminals from other brain regions to suppress inhibitory activity on VTA dopamine neurons. Yet, few studies have accounted for the functional diversity of VTA dopamine neurons that mediate distinct aspects of cue-reward processing and motivation. This includes findings of differences in opioid-induced dopamine release in subregions of the nucleus accumbens (NAc), such as the NAc core and NAc medial shell (mShell), as well as differences in the opioid recruitment of VTA dopamine subpopulations that distinct project to NAc subregions. Determining the receptor and synaptic mechanisms that underlie the diversity of VTA dopamine responses in the development of opioid dependence will help unravel the neural basis of the progression of opioid-use disorder. We have used a genetic approach to isolate functionally distinct subpopulations of dopamine neurons that project to discrete regions of the NAc. Corticotrophin releasing hormone receptor 1 (Crhr1)-Cre VTA dopamine neurons were found to selectively project to the NAc Core (VTA-Core) and cholecystokinin (Cck)-Cre VTA dopamine neurons selectively project to the NAc medial Shell (VTA-mShell). We have collected data using fiber photometry that suggests a biased recruitment of the VTA-mShell during opioid exposure. Further, using patch-clamp electrophysiology we have discovered selective MOR-sensitive inhibition of synaptic



inhibitory post synaptic currents (sIPSCs, GABAergic) onto Cck-VTA neurons. These data suggest a circuit-specific effect of opioid action onto a select subpopulation of VTA dopamine neurons. Yet, we do not know which GABAergic input is mediating this phenotype and whether MORs on these inputs are necessary for morphine associative learning. We will work to delineate how MORs expressed on distinct GABAergic inputs contribute to the functional diversity of VTA dopamine neuron activity and learning following morphine exposure. We will combine CRISPR/Cas9 gene editing in specific dopamine subpopulations with mouse behavior and fiber photometry to determine the necessity of MORs on select GABAergic inputs for the activity dynamics associated with morphine exposure and during morphine associative learning.

## Maryland

Investigator: Nathan Fox, PhD  
Institution: University of Maryland, College Park  
College Park, MD  
Project Title: 16/24 Healthy Brain and Child Development National Consortium  
Research: Behavioral Research  
Research Area: Brain Development, EEG, MRI, Infant Development, Drug  
Exposure Pregnancy  
Earliest Start Date: May 15, 2024  
Housing: Off-Campus

**Student Qualifications:** Undergraduates who are psychology or neuroscience majors are preferred. If an undergraduate is bilingual (Spanish/English) that is preferred. The intern will work with families who have infants.

**Project Description:** The University of Maryland Child Development lab is one of the 26 sites for the Healthy Brain and Child Development (HBCD) study. This is a national study recruiting pregnant women from diverse backgrounds including those using substances during pregnancy. Infants of these women will be followed longitudinally through their eighth birthday. The lab is collecting brain activity and brain imaging data on the infants as well as behavioral assessments. An undergraduate who is placed in the lab will have an opportunity to participate in the study, will be trained in the methods and approaches being used in the study. They will be exposed to brain imaging methods, to assessments of infants, and to the approaches used for recruitment and retention.

# Maryland

**Investigator:** Jessica F. Magidson, PhD  
**Institution:** University of Maryland, College Park  
 College Park, MD  
**Project Title:** Stepped Care, Peer-Delivered Intervention to Improve ART  
 Adherence and SUD in Primary Care  
**Research:** Clinical Research  
**Research Area:** Global Health, Substance Use, Mental Health, HIV, Task Sharing,  
 South Africa, Peer Delivery, Of Services, Cost Effectiveness,  
 Implementation Science, Trauma  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** We look for undergraduate applicants who are interested in pursuing a career and studying if and how mental health, substance use, and HIV treatments work and/or who are studying how to best deliver treatments in resource-limited settings (implementation science). Furthermore, we seek applicants who are passionate about increasing knowledge regarding substance use through research and/or globally increasing treatment access to evidence-based programs. We welcome applicants from all majors and areas of study; however, our research is generally most aligned with those studying psychology, public/global health, social work, and/or international development. We look for applicants who are hard-working, detail-oriented, willing to learn, responsible, and reliable. Excel, SPSS (or other statistical packages), REDCap, and qualitative data collection and analysis (interviewing, transcribing, coding) experience a plus! Additionally, as we work with stigmatized identities (such as people struggling with substance use, people living with HIV) in communities all over the world, all applicants must be open-minded, committed to anti racism, willing to reflect upon personal biases and explore how these biases might impact research.

Our research will not require the student to work directly with participants, however we will ask them to complete ethics training so that they can access de-identified participant data.

This position will be primarily virtual. However, the student will be asked to come on-campus to the lab at the University of Maryland weekly or at least a few times during the internship.

**Project Description:** South Africa is home the highest number of people living with HIV in the world and has a high burden of substance use disorder (SUD). Globally, a SUD treatment gap exists, particularly in low and middle-income countries (LMICs), such as South Africa, where only 1-4% of individuals receive minimally adequate treatment. Workforce shortages are also severe in LMICS, and countries such as South Africa have responded to this through the implementation of task sharing models to expand access to antiretroviral therapy (ART) and mental health services. However, efforts to implement task shared, SUD treatment and ART adherence interventions that can be feasibly and sustainably integrated into primary care are

limited. Therefore, the purpose of this study is to help fill this gap in care by evaluating Khanya, a peer delivered, behavioral intervention to improve HIV care outcomes and reduce substance use. The present study is a hybrid effectiveness implementation trial designed to evaluate Khanya compared to usual care, enhanced with referral to a local outpatient substance use treatment program (Enhanced Standard of Care - ESOC) over 12 months. To provide care for those most in need, participants will be patients with HIV who are struggling with ART adherence and have elevated SUD risk. In this study, Khanya will be delivered as a stepped care package in which the least resource-intensive part of the intervention (i.e., a single session problem solving intervention for HIV medication adherence) will be delivered first. Only individuals randomized to the Khanya intervention who are still struggling with HIV medication adherence after the first session will be stepped up to receive the more comprehensive, resource-intensive part of the intervention (i.e., six additional sessions of the intervention). Primary effectiveness outcomes in this clinical trial include ART adherence and SUD.

## Michigan

**Investigator:** Julia Felton, PhD  
**Institution:** Henry Ford Health  
Detroit, MI  
**Project Title:** Improving Decision Making to Prevent Substance Misuse among Adolescents from Traditionally Underserved Communities  
**Research:** Behavioral Research  
**Research Area:** Prevention of Substance Misuse, Adolescence, Traditionally Underserved Communities, Community-Engaged Research  
**Earliest Start Date:** June 5, 2024  
**Housing:** Off-Campus

**Student Qualifications:** No prior research experience is required.

**Project Description:** Adolescents living in low-income neighborhoods are both more likely to experience adverse childhood events and less likely to have access to evidence-based preventative substance use interventions. Thus, there is a critical need to identify interventions that can effectively prevent the escalation of substance use in vulnerable youth and be feasibly disseminated in low-resource, traditionally underserved communities. Guided by an experimental therapeutics' framework, recent findings from this research team and others suggests the efficacy of utilizing a computer-based working memory training program to improve positive decision-making and reduce risk for substance misuse. Computer-based training programs may be particularly suitable to implement in low-resource communities for at-risk adolescents. Computerized interventions require limited staff and space resources, making them both feasible and scalable in traditionally underserved communities. This project will pilot a computer-based working memory intervention among adolescents exposed to early life adversity in the low-resource community of Detroit, Michigan.

## Michigan

Investigator: Shelly Flagel, PhD  
Institution: University of Michigan  
Ann Arbor, MI  
Project Title: Probing the Role of a Hypothalamic-Thalamic-Striatal Circuit in Cue-Driven Behaviors  
Research: Basic Research  
Research Area: Behavioral Neuroscience, Neuropsychopharmacology  
Earliest Start Date: May 13, 2024  
Housing: Off-Campus

**Student Qualifications:** Students should have prior experience working with rodents and be comfortable doing so. They will be exposed to surgical procedures as well as behavioral paradigms using rats. They should also be willing to perform basic bench work with brain tissue and microscopy. They should be passionate about basic research of relevance to addiction and interested in pursuing graduate studies in behavioral neuroscience.

**Project Description:** This research is aimed at elucidating the neural circuitry underlying individual differences in cue-motivated behaviors that are of relevance to addiction and other psychiatric disorders. We are specifically focused on subcortical neural circuitry - the hypothalamic-thalamic-striatal circuit - and its role in learning the value of cues associated with food and drug reward. We use chemogenetic and optogenetic approaches in rats combined with detailed behavioral analyses. Trainees will be exposed to stereotaxic surgeries, brain sectioning, behavioral paradigms, microscopy, and data analysis.

# Michigan

Investigator: Thuy Nguyen, PhD, MPA  
 Institution: University of Michigan, School of Public Health  
 Ann Arbor, MI  
 Project Title: The Impact of Surgery on Outcomes for Patients taking  
 Medications for Opioid Use Disorder  
 Research: Other Research  
 Research Area: Opioid Epidemic, Health Policy, Health Economics, Treatment  
 Access, Opioid Addiction  
 Earliest Start Date: May 20, 2024  
 Housing: On-Campus

## Student Qualifications:

- Enthusiastic and motivated
- Strong critical thinking skills
- Strong writing skills
- Strong communication skills – must be comfortable communicating with an interdisciplinary team
- Open and receptive to feedback
- Interest in health policy and the opioid epidemic
- Interest in data analysis and programming (SAS, STATA, SQL)
- Prior research experience is strongly preferred, though not required.

**Project Description:** The Michigan Public Health - Substance Use Policy and Economic Research (M-SUPER) Network is a consortium of investigators, led by Dr. Nguyen, with expertise in health economics, policy evaluation, and health services research. The network uses quantitative analytical methods, including statistical software and programming, to address pressing knowledge gaps and inform public health policy surrounding the opioid epidemic. Active NIDA funded Ro1 research projects include an investigation into the effects of surgery on opioid use disorder treatment and an investigation into the effects of insurance barriers on health outcomes among patients with opioid use disorder. The network seeks an enthusiastic and motivated intern to contribute to this collaborative and interdisciplinary work.

# Michigan

Investigator: Susanne Brummelte, PhD  
 Institution: Wayne State University  
 Detroit, MI  
 Project Title: The Effects of Gestational Opioid Exposure on the Maternal Brain, Behavior, and Microbiome  
 Research: Basic Research  
 Research Area: Opioids, Pregnancy, Behavioral Neuroscience, Development, Maternal Brain, and Behavior  
 Earliest Start Date: May 15, 2024  
 Housing: On-Campus

## Student Qualifications:

- Experience in immunohistochemistry, microscopy, with rodent research and behavioral testing preferred, but not required.
- Experience (or desire) to learn coding in R or Python preferred, but not required.

**Project Description:** Due to the opioid crises in the United States, many pregnant women are using opioids or are treated with opioid maintenance therapy drugs like buprenorphine. Buprenorphine exposure during pregnancy and parturition may alter the endogenous opioid regulation of the maternal brain network, which could explain the reduced maternal care and increased offspring mortality and altered long-term outcome of the offspring that is observed in animal studies. Our translational rodent model will help illuminate consequences of gestational opioid exposure for the maternal brain, maternal care and the gut-brain axis and explore interventions to help improve the health and outcome of mothers and their offspring. This summer we will investigate the neurobiological consequences of gestational opioid exposure for Aim1 of our current grant. Briefly, 5 independent groups of dams will receive either vehicle, morphine, buprenorphine (BUP, medication for opioid use disorder (MOUD)) or morphine followed by a switch to BUP (or vehicle) during gestation (to mimic opioid use followed by MOUD). Maternal behaviors and pup vitality will be assessed and on the second postpartum day (PD2), animals will be sacrificed to analyze changes in neurotransmitter levels and brain activity and connectivity patterns using state-of-the-art imaging techniques such as high-performance liquid chromatography, and immunolabeling-enabled 3-dimensional imaging of solvent-cleared organs (iDISCO) followed by light-sheet microscopy for maternal brain activity mapping. While the behavioral portion should be completed by the summer, the brain analysis will still be ongoing throughout the summer and beyond.



# Michigan

Investigator: Andria Eisman, PhD  
 Institution: Wayne State University  
 Detroit, MI  
 Project Title: Enhancing the Impact of Evidence-Based Prevention for Youth:  
 The Rapid Adaptation to Prevent Drug Use (RAPD)  
 Implementation Strategy  
 Research: Preventive Research  
 Research Area: Drug Use Prevention, School-based Research, Implementation  
 Science, Adolescence  
 Earliest Start Date: May 15, 2024  
 Housing: On-Campus

## Student Qualifications:

- Enrollment in public health program or related field of study Quantitative and/or qualitative data analysis experience preferred
- Commitment to community partner engagement
- Excellent writing, computer, organizational, and communication skills
- Capacity for both team-oriented and independent work

**Project Description:** Rapid Adaptation to Prevent Drug Use (RAPD) is a collaborative study focused on the Michigan Model for Health (MMH), a widely adopted health universal prevention curriculum, for use in rapid response to changing drug trends. In cooperation with community partners, the Michigan Department of Health, and Human Services (MDHHS), the Michigan Department of Education (MDE), and the Michigan School Health Coordinators Association (MISHCA), the research team will have just completed the rapid adaptation process of MMH piloted in ten diverse Michigan middle schools. During the summer, the research team will begin pilot study data analysis. We will also work with our community partners to prepare the control schools to deploy the RAPD bundle in the 2024-2025 school year and disseminate preliminary findings to community partners.

# Minnesota

Investigator: Mustafa al'Absi, PhD  
 Institution: University of Minnesota  
 St. Paul, MN  
 Project Title: Endogenous Opioid Dysfunction, Stress, and Risk for Smoking  
 Relapse  
 Research: Behavioral Research  
 Research Area: Stress, Psychological Trauma, Addiction  
 Earliest Start Date: May 15, 2024  
 Housing: On-Campus

**Student Qualifications:** Interest in stress and psychological trauma with a background in psychobiology. Motivation and self-direction are important assets.

**Project Description:** Stress is one of the most reported triggers of smoking relapse. It increases frequency of smoking among chronic smokers and accelerates progression towards full relapse among abstinent smokers. This relapse risk is particularly high in the presence of other negative affective states, including anxiety, irritability, depression, and craving, especially in women. Our previous research has demonstrated altered hypothalamic-pituitary-adrenocortical (HPA) axis and endogenous opioid system (EOS) regulation of the stress response in smokers. We found that 1) smokers exhibit enhanced basal HPA activity, 2) they exhibit decreased cortisol responses to multiple acute stress procedures, and 3) early smoking relapse can be predicted by attenuated adrenocorticotropin (ACTH) and cortisol responses to stress. Recent results using an opioid blockade challenge demonstrate blunted opioid regulation of the HPA stress response in smokers relative to nonsmokers; and smoking appears to acutely normalize opioid regulation of the stress response. The clinical significance of altered opioid regulation of the stress response has not been tested in the clinical context of smoking cessation and relapse. Building on previous findings, we plan in this new study to take a novel approach in addiction relapse research by identifying indices of risk for relapse using opioid- HPA stress response patterns. Our hypothesis is that smokers who exhibit blunted HPA stress response to opioid blockade are more likely to relapse early in their cessation attempt. Blunted opioid regulation contributes to inefficient stress response and may exacerbate stress effects on craving and withdrawal symptoms. We will establish the link between altered endogenous opioid regulation of the HPA stress response, withdrawal symptoms, and craving during smoking cessation. We will develop a model to predict early smoking relapse using HPA responses to stress and HPA responses to endogenous opioid blockade. Finally, we will examine sex differences in the HPA response to stress, in the HPA response to opioid blockade, and in predictors of relapse. This research represents a step forward in translating established preclinical neurobiological models of addiction and stress. It is grounded in theory, builds on important preliminary results, and uses rigorous and reproducible procedures. Demonstrating the utility of an opioid challenge in predicting relapse is a novel direction in addiction relapse research that will enable indexing two important stress biological pathways, providing both a novel mechanism of long-term effects

of tobacco addiction and a marker of treatment outcome and relapse probability. This will facilitate future efforts targeting those susceptible to effects of stress on their risk for relapse with new or existing behavioral and pharmacological treatments. Reducing relapse rates will reduce tobacco use and its devastating health effects.

## Minnesota

Investigator: Alonso Guedes, PhD  
Institution: University of Minnesota  
St. Paul, MN  
Project Title: Characterization of a Novel Spinal Astrocyte-Neuron Signaling System in Chronic Pain  
Research: Drug Development Research  
Research Area: Studies Related to Opioid Antinociception in Mice  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** Some experience with handling rodents is desirable but not mandatory.

**Project Description:** We have identified a novel intercellular signaling system in spinal cord involving the multifunctional enzyme CD38 that may inform the development of new-generation analgesics and help solve this critical void. CD38 was first identified as an immune cell marker and is now widely recognized as a multifunctional enzyme that regulates cellular responses to chemical cues via the metabolism of nicotinamide adenine dinucleotide (NAD) into multiple mediators of calcium signaling. Using genetic and pharmacologic methods in mouse models of neuropathic and inflammatory pains, we generated evidence suggesting that CD38 expressed in astrocytes is part of an endogenous anti-nociceptive system in the spinal cord that is relevant to chronic pain. There is, therefore, a critical need to fully characterize and validate the role of CD38 and its metabolites in reducing hypersensitivity associated with peripheral nerve injury and inflammation. Our long-term goal is to understand the mechanism by which CD38 influences nociceptive signaling to develop novel pain therapies. Our overall objective in this application is to characterize how CD38 expression in the spinal cord mediates anti-nociception in mouse models of neuropathic and inflammatory pains.

## Minnesota

**Investigator:** Sade Spencer, PhD  
**Institution:** University of Minnesota  
St. Paul, MN  
**Project Title:** Glutamatergic Plasticity that Drives Cannabinoid Withdrawal and Craving  
**Research:** Basic Research  
**Research Area:** Cannabinoids, Withdrawal, Plasticity  
**Earliest Start Date:** May 29, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The intern should have an interest in behavioral neuroscience as well as molecular biology. Some prior wet lab experience, including in the classroom setting, is preferred. Prior experience rat handling would be useful as this research requires the student to work with animals; although, it could be modified so that the student partners with someone and therefore only performs the post-mortem procedures. Still, the student would need to be comfortable with the idea of using animal models in research.

**Project Description:** The parent research project is designed to understand how adolescent cannabinoid use induces changes in glutamate transmission, specifically in the nucleus accumbens, that promote negative affective processes and craving. The proposed summer research project is designed to complement and extend the funded research aims. The goal of this research is to directly assess whether THC withdrawal induces a conditioned place aversion. The undergraduate student will work with current students/postdocs to perform jugular catheter surgeries and THC self-administration. Following self-administration, the student will perform conditioned place aversion using rimonabant precipitated withdrawal. Following behavioral testing, the brains will collect for molecular analysis of ionotropic and metabotropic glutamate receptor subunit expression using subcellular fractionation and Western blotting techniques. If time allows, this process will be repeated to examine the same behavioral and molecular adaptations associated with spontaneous withdrawal.

## Minnesota

**Investigator:** Beau Ances, MD, PhD  
**Institution:** Washington University in Saint Louis  
St. Louis, MN  
**Project Title:** Cannabis, HIV and Mental Processing Systems (CHAMPS)  
**Research:** Clinical Research  
**Research Area:** Neuroimaging, HIV, Cannabis  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Strong background in programming and computer science, basic neuroanatomy

**Project Description:** Our lab employs novel methods to identify key determinants and consequences of concurrent HIV infection and regular cannabis use. We are acquiring extensive phenotype data from peripheral and brain markers of immune activation, brain structure, and neuropsychological performance (NP) in persons living with HIV (PLWH) receiving combination anti-retroviral therapy (cART) (80 regular cannabis users and 80 non-users) and HIV uninfected (HIV-) controls (80 regular cannabis users and 80 non-users). Our overall hypothesis is that cannabis use leads to increases in inflammation in the peripheral and brain compartments. We also hypothesize that phenotypic signatures due to regular cannabis use and HIV will be delineated through NP and brain volumetrics. In Aim 1 we hypothesize that regular cannabis use will increase both peripheral and brain immune indices in PLWH on cART. In Aim 2 we hypothesize that regular cannabis use will lead to a worsening of NP and reductions in brain volumetrics in both PLWH on cART and HIV- controls. This proposal will provide key insights into the effects of regular cannabis and HIV on peripheral and brain markers of immune function and NP in PLWH and HIV- controls. These insights are critical for cure strategies and ongoing HIV treatment initiatives.

## North Carolina

**Investigator:** Roger Vilardaga Viera, PhD  
**Institution:** Duke University  
Durham, NC  
**Project Title:** Increasing the Health Equity and Population-Level Impact of a Digital Therapeutic for Smokers with Psychiatric Illness  
**Research:** Behavioral Research  
**Research Area:** Digital Therapeutics, Smoking Cessation, Serious Mental Illness, Digital Health Equity, Clinical Trials, Mixed-Methods Research, Participatory Research  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Ideal candidates for this summer intern position would have an interest in clinical behavioral research, and a background in psychology, addiction science, smoking cessation, digital health, or health equity research. Bilingual (Spanish/English) candidates will be strongly considered. This research may require phone interactions with individuals with serious mental illness. This research will not require work with animals and/or tissue samples.

**Project Description:** Tobacco use disorder disproportionately affects patients with serious mental illness. Our research shows that over the last decade, racial and ethnic minorities with serious psychological distress sustained high rates of smoking -- in sharp contrast to Whites, who experienced a significant decline. This summer research opportunity will provide training and research experience in a complementary study of a randomized controlled trial testing a digital therapeutic for smoking cessation among people with serious mental illness (i.e., schizophrenia, bipolar, and persistent depressive disorders). This complementary study (often called “ancillary study”) will evaluate barriers and facilitators of digital therapeutics' use among racial and ethnic minorities with serious mental illness and related partners, such as providers and community mental health clinics. The study has a focus on the following areas of research: (1) health equity and participatory research, (2) implementation science, and (3) digital therapeutics. The results of this ancillary study will inform future treatment development efforts to address health inequities in this patient population.

## North Carolina

Investigator: Aysenil Belger, PhD  
 Institution: University of North Carolina at Chapel Hill  
 Chapel Hill, NC  
 Project Title: Developmental Pathophysiology of Adverse Patterns of  
 Substance Use in Adolescents with Anxiety  
 Research: Clinical Research  
 Research Area: Neuroimaging of Stress, Emotion, and Executive Brain Circuits,  
 Adolescence, Risk for Substance Use, Anxiety, Stress  
 Earliest Start Date: May 25, 2024  
 Housing: On-Campus

### Student Qualifications:

1. Neuroscience, psychology, biology majors preferred
2. Experience with neuroimaging data collection and analysis
3. Experience with Matlab and R
4. Experience with human subject testing

**Project Description:** This 8-week summer research internship in the Neurocognition and Imaging Laboratory at UNC will provide the incoming interns an opportunity to be part of research team investigating brain development and neural circuits organization in adolescents ages 12-14 years of age. The children will be followed longitudinally with MRI, stress protocols, clinical and cognitive measures. The summer experience will have 3 broad components:

1. Hands-on research and data acquisition and analysis: interns in the Belger Lab (<https://nirl.web.unc.edu>) will have the opportunity to work with multiple advisors/supervisors. Specifically, the intern will learn functional MRI data collection, neurocognitive assessments in adolescents ages 12-14. The intern will also learn how to analyze neural network data working with Dr. Jessica Cohen (<https://cohenlab.web.unc.edu>). The interns will also work with Dr. Ridenour on assessment of substance use risk and epidemiology.
2. Professional Development: As part of this programming, the summer interns will attend professional development opportunities available to Biological Sciences Training Program PhD students which include workshops that provide insight into effective communication, responsible conduct of research, how to write a statement of purpose for PhD applications, mental health and wellness, identity, GRE prep classes, Resume writing, interview skills and intersectionality to name a few.
3. Didactics/journal club/lectures: the interns will participate in weekly journal clubs (lab meetings and neuroimaging journal clubs), to discuss methodology and ongoing lab project reviews.
4. In addition to lab-specific activities, the interns will be embedded in a cohort of students participating in over 15 similar summer internship programs on the UNC campus, coordinated through the UNC SOM Office of Graduate Education (OGE). The OGE serves as a central hub for UNC PhD biomedical trainees, as well as their



corresponding faculty advisors, across 15 different life sciences departments. Within the OGE Dr. Christian Gaines is the Assistant Director of Doctoral Success and Diversity, Assistant Director of Maximizing Student Development and Director of Pre-Baccalaureate Summer Initiatives. In this role, she advises, mentors, and provides academic support for over 100 PhD trainees. As Director of Pre-Baccalaureate Summer Initiatives, she manages professional development programming for 15 various summer internship programs at UNC. This programming is specifically geared towards students interested in pursuing their PhD in various biomedical fields. As part of this program, students participate in numerous professional development activities, described above.

Additional considerations: Summer Interns can also get parking at the residence lots. NIH interns get priority for housing and parking over the summer. Parking arrangements can be done on behalf of the students prior to arrival. Parking costs are estimated to be 14/week.

## North Carolina

Investigator: Guorong Wu, PhD  
Institution: University of North Carolina at Chapel Hill  
Chapel Hill, NC  
Project Title: Promoting Collaborative Research on Human Connectome  
Analysis for Substance Use Disorders  
Research: Basic Research  
Research Area: Brain Network Analysis, Machine Learning, Neurological  
Disorders  
Earliest Start Date: March 1, 2024  
Housing: On-Campus

**Student Qualifications:** Basic skillsets on machine learning and biostatistics.

**Project Description:** The large scale of public human connectome data allows us to study the communication dysfunction that underlines neurological disorders. We will neuroimaging and machine learning techniques to identify high-dimension patterns (biomarkers) and apply to the disease early diagnosis.

## North Carolina

Investigator: Rong Chen, PhD  
Institution: Wake Forest School of Medicine  
Winston Salem, NC  
Project Title: Cocaine Self-Administration and Cholesterol Metabolism  
Research: Basic Research  
Research Area: Drug Abuse, Brain, Dopamine  
Earliest Start Date: May 15, 2024  
Housing: Off-Campus

**Student Qualifications:** has taken biochemistry class; prior experience working with animals is a plus but not required. Based on the experience, the student can work on the biochemical or behavioral aspect of this project.

**Project Description:** The Center for Disease Control and Prevention reports that death rates involving cocaine are on the rise. There is still no effective pharmacological treatment for cocaine use disorder (CUD). Cocaine binds to the dopamine transporter (DAT), inhibiting dopamine (DA) reuptake and thus elevating extracellular DA levels in the striatum. Striatal DA elevation is associated with subjective experience of euphoria in humans. Recent meta-analysis of neuroimaging in patients with CUD indicates that acute cocaine-induced elevation of DA is blunted. This dysregulation likely contributes to repeated cycles of cocaine-seeking and taking behavior and accidental overdoses. A critical knowledge gap is how cocaine-DAT interactions are disrupted by chronic cocaine exposure. DAT adopts an outward-facing conformation in a cholesterol-enriched membrane environment to accommodate high-affinity cocaine binding. Perturbation of cholesterol homeostasis in cultured cells and ex vivo disrupts cocaine-DAT interactions. Our preliminary data show that cocaine SA reduces striatal cholesterol content and importantly, ex vivo cholesterol replenishment to striatal synaptosomes improves the ability of cocaine to inhibit DA reuptake. Based on these observations, this proposal will investigate a previously unknown molecular mechanism whereby cocaine modulation of brain cholesterol metabolism mediates cocaine-DAT interactions. We will explore whether pharmacological and genetic modulation of cholesterol content is a new avenue to mitigate disrupted cocaine-DAT interactions and attenuate cocaine self-administration.

# Nebraska

Investigator: Shilpa Buch, PhD  
 Institution: University of Nebraska Medical Center  
 Omaha, NE  
 Project Title: Single Cell Determinants of Brain in the Context of Viral Persistence In SIV/cART/Cocaine Non-Human Primates  
 Research: Basic Research  
 Research Area: HIV, Drug Abuse, Aging, NeuroHIV, Neuroinflammation  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** We welcome interns from diverse educational backgrounds, including biology, neuroscience, biochemistry, and related fields, who share an interest in neuroscience and immunology, particularly neuroinflammation. While prior laboratory experience is advantageous, it's not a requirement. Strong analytical skills, effective communication, and a commitment to research ethics are essential qualities. Our research primarily involves in vitro cell culture experiments, in vivo animal models, and nonhuman primate models. We aim to provide a supportive and educational environment, ensuring that interns with varying levels of experience have the opportunity to contribute to our research and develop their skills.

**Project Description:** Welcome to Dr. Buch's research group, where we focus on the intricate intersection of HIV, drug abuse, and neuroinflammation. As an undergraduate student, you'll have the opportunity to be a part of cutting-edge research that explores the following areas:  
 Research Goals:

1. Inflammasome Signaling: Investigate how inflammasome signaling pathways contribute to neuroinflammation in the context of HIV and drug abuse.
2. Exosomes: Explore the role of exosomes in intercellular communication and their impact on neuroinflammatory processes.
3. Iron-Mediated Ferroptotic Cell Death: Examine the mechanisms underlying iron-mediated ferroptotic cell death and its implications for neurodegeneration.

## **Procedures and Research Methods:**

As an undergraduate researcher in Dr. Buch's group, you'll have the opportunity to engage in hands-on scientific inquiry. Here's what you can expect:

1. In vitro studies: You'll work with cell cultures to investigate the cellular and molecular mechanisms involved in neuroinflammation. This may include cell culture maintenance, experimental setup, and data analysis.
2. In vivo models: Gain experience with animal models to study neuroinflammation and drug abuse. This might involve administering substances, behavioral assessments, and sample collection.
3. Nonhuman primate models: Participate in research using nonhuman primates to understand the relevance of our findings to humans. This could include assisting in experiments, data collection, and observation.

4. Data analysis: Learn to analyze and interpret research data, including statistical analysis and data visualization.
5. Lab techniques: Acquire skills in various lab techniques, including immunohistochemistry, molecular biology, and microscopy.

Choosing a research site is an important decision, and we encourage you to align your preferences with your interests and career goals. You'll have the opportunity to contribute to meaningful research that may ultimately lead to advancements in the fields of HIV, drug abuse, and neuroinflammation. We look forward to welcoming you to our research team and helping you grow as a scientist.

# New Hampshire

Investigator: Conor Cullinane, PhD  
 Institution: Pirouette Medical Inc.  
 Portsmouth, NH  
 Project Title: A Rugged, Reliable, Portable, Safe, and Simple Naloxone HCl Auto-Injector for Life-Saving Treatment of Opioid Overdose  
 Research: Drug Development Research  
 Research Area: 3D Print, Adhesives, Ambulances, Data, Medical Devices, Dose, Emergency Situation, Epinephrine, Equipment, Food and Drug Administration Device Approval, Hand Health, Hospitalization, Hospitals, Human, Individual Injections, Injury, Intramuscular, Modification, Naloxone, Needles, Needlestick Injuries, Opioid, Opioid Antagonist, Overdose, Pharmaceutical Preparations, Safety, Self-Administration, Addiction, Design Verification, Ergonomics, Manufacture, Manufacturing Process  
 Earliest Start Date: May 6, 2024  
 Housing: Off-Campus

**Student Qualifications:** Completion of at least 2 years into a bachelor's degree program (or higher), ideally in the following majors: Biomedical Engineering or any Life Science degree with a concentration in Biomechanics or Human Factors Engineering. Knowledge of using Solid works. Familiarity with technical drawings, GD&T. Experience as a maker (3D printing, laser cutting, lathe, etc.). Ability to read, understand, and follow work instructions. Ability to use mechanical and electrical hand tools. Ability to always implement safe work practices. Ability to see and manipulate small parts. Experience with reading and following blueprints and/or engineering drawings. Communicates ideas, information, and recommendations clearly, effectively, and frequently (oral and written). A willingness and ability to wear multiple hats, operate independently, and as part of a team in a small organization setting where a self-starter personality is key. Detail-oriented, Organized, Safety-minded.

**Project Description:** From 2019 to 2020, overdose deaths in the US increased by 30% year on year; 187 people die each day from opioid overdose in the US. Naloxone has significantly decreased opioid mortality with increased usage as a first-line life-saving measure prior to emergency help and hospitalization. Naloxone HCl Injection, USP (Naloxone) is an opioid antagonist that rapidly reverses overdose and quickly restores normal breathing. It can be given to any person showing signs of an overdose. There is no potential for abuse/addiction to Naloxone. The drug is low cost, and available across all 50 states, often without a prescription. Ambulances and hospitals have Naloxone on hand, and medical staff trained to administer it; however, a call for help or trip to the ER is often too late. At least 40% of the time, life-saving treatment for opioid overdose is administered by an untrained bystander, often under situations of extreme stress. The benefits of Naloxone for reversing the effects of opioid overdose have been demonstrated conclusively. The most pressing question today then is what method of administration of Naloxone is most efficacious for untrained

bystanders. Studies show that Auto-Injectors (AIJ) offer the best combination of low cost, safety, reliability, ergonomic design, and most of all rapid fail-safe injection of Naloxone. Towards this end, Pirouette Medical has developed a novel and proprietary AIJ platform, based on a previous AIJ QUICPUSH for epinephrine injections, that can be adapted to safely deliver intramuscular Naloxone injections correctly and easily. Our Naloxone Auto-Injector (NAIJ), REZQGO, is a low-profile, disk-shaped, injection device with a patient-centric focus on affordability, portability, and usability. Its intuitive design allows individuals with limited or no training to easily administer an injection to themselves or others. The AIJs physical design allows for simple and stress-free self-administration, minimizing the risk of inadvertent administration, lacerations, needle sticks, or other injuries. The device can safely and effectively inject life-saving drugs through various clothing materials. Finally, the REZQGO design is versatile and can be adjusted to accommodate a wide variety of volumes and other parameter changes such as dose delivered and needle injection depth for future drug pairings. In Phase I we will rigorously verify the design and usability of a non-GMP prototype(s) of our REZQGO auto- injector. In Phase II the goal will be to manufacture three GMP registration batches, complete the full set of design validation tests, and submit an NDA to the FDA for regulatory approval via the 505(b)(2) pathway, using QUICPUSH and other commercially available AIJ projects as predicate devices. Overall, this project will help bring to market a novel low-cost device that anyone could use to safely deliver lifesaving Naloxone HCL Injection, USP intramuscularly during an opioid overdose.

## New Jersey

Investigator: Joseph Pergolizzi Jr., MD, MBA  
 Institution: Enalare Therapeutics Inc.  
 Princeton, NJ  
 Project Title: Development of Medication for The Treatment of Respiratory Depression Due to Opioid (Prescribed or Illicit) Overdose/Multidrug (Polysubstance) Overdose in a Hospital or Community Setting  
 Research: Clinical Research  
 Research Area: The main research focus will be on medication and treatment development and the development of new and improved strategies to prevent substance use and its many consequences.  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** The preferred intern should be a health science major, preferably on a preclinical track with the intention of attending medical school soon after graduation. Career interests should center around the advancement of medicine. The research conducted during these 8 weeks will require students to work with humans both in person and virtually.

**Project Description:** This summer research project aims to support the growth of a diverse biomedical research workforce in substance use and addition science. The overarching goals of this research endeavor include:

1. Identification of Target Populations: To identify specific populations, demographics, or risk factors that are more susceptible to substance abuse and its consequences.
2. Medication Development: To investigate and develop novel pharmacological interventions, including medication and therapies, to aid in the treatment of substance use disorders and related mental health issues.
3. Treatment Effectiveness: To assess the effectiveness of existing treatment modalities, both pharmacological and behavioral, in addressing substance use disorders and co-occurring conditions.

Prevention Strategies: To explore and design prevention strategies that target different stages of substance use initiation, ranging from primary prevention (preventing initial use) to secondary prevention (early intervention) and tertiary prevention (reducing harm among those with established substance use disorders). This research project will employ a multi-faced approach, combining quantitative and qualitative research methods. The Intern Role will include the learning process of:

1. Epidemiological Studies: Conducting surveys and data analysis to identify trends and risk factors associated with substance use within different populations.
2. Clinical Trials: Learning about randomized controlled trials to test the efficacy and safety of new medications and treatment approaches for substance use disorders.



3. Longitudinal Studies: Learning about the process of following individuals over time to understand the progression of substance use and its consequences, and to assess the long-term impact of prevention and treatment strategies.
4. Qualitative Research: Gathering qualitative data through interviews and focus groups to gain insights into the experiences and perspectives of individuals affected by substance use and those involved in prevention and treatment efforts.
5. Policy Analysis: Examining existing policies and regulations related to substance use to identify potential areas for improvement and alignment with research findings.
6. Community Engagement: Collaborating with communities, healthcare providers, and stakeholders to implement and evaluate prevention and treatment programs on a local level.

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5. Policy Analysis: Examining existing policies and regulations related to substance use to identify potential areas for improvement and alignment with research findings.
6. Community Engagement: Collaborating with communities, healthcare providers, and stakeholders to implement and evaluate prevention and treatment programs on a local level.

# New Jersey

Investigator: Tatiana Engel, PhD  
 Institution: Princeton University  
 Princeton, NJ  
 Project Title: Multiscale Computational Frameworks for Integrating Large-Scale Cortical Dynamics, Connectivity, and Behavior  
 Research: Other Research  
 Research Area: Computational Neuroscience, Systems Neuroscience, Mathematical Neuroscience, Statistical Physics, Stochastic Processes, Dynamical Systems Theory, Machine Learning, Artificial Neural Network Models, Recurrent Neural Network Models, Cognitive Functions, Decision Making, Attention, Working Memory  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Prerequisite: strong programming skills in Python, Matlab, or C/C++; solid knowledge of linear algebra, probability, and statistics; basic knowledge of differential equations and dynamical systems. Major in physics, mathematics, neuroscience, computer science, engineering, or related quantitative discipline. All research will be based on mathematical modeling and/or computational data analysis. Proficiency with computing environments is necessary. Experience using high performance computer clusters and GPUs is a plus.

**Project Description:** Core brain functions—perception, action, decision-making—depend on complex patterns of neural activity coordinated within local microcircuits and across brain regions. Recently, massively parallel neurotechnology’s enabled activity recordings from thousands of neurons on the brain-wide scale and provided detailed maps of the brain-wide anatomical connectivity. These large-scale datasets reveal dynamic activity patterns that are highly variable in time and widely distributed across structured brain networks. How this widespread activity emerges from anatomical connectivity and how it gives rise to behavior is not well understood.

In our lab, we use computational and theoretical approaches to investigate how coordinated activity arises from distributed neural circuitry to drive behavioral and cognitive functions. We develop mathematical models and data analysis methods to reveal distributed circuit mechanisms from rich experimental data. We employ and extend tools and ideas from diverse fields, including statistical mechanics, machine learning, dynamical systems theory, and information theory. Our work benefits from close collaborations with experimental neuroscience laboratories collecting neurophysiological data in animals engaged in sophisticated tasks, such as attention, decision-making, and learning. All work in the lab is computational, including mathematical modeling of neural systems and analysis of neural activity recording data from behaving animals.



## New Jersey

**Investigator:** Travis E. Baker, PhD  
**Institution:** Rutgers University, Center for Molecular and Behavioral Neuroscience  
 Newark, NJ  
**Project Title:** Recovery of Reward Function in Nicotine Use Disorder Using a Combination of Robotics, Electrophysiology, and TMS  
**Research:** Clinical Research  
**Research Area:** Reward Functioning, Human Neuroimaging, Robot-Guided Transcranial Magnetic Stimulation, Nicotine Use Disorder, EEG, Anterior Cingulate Cortex  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Ideally, a candidate should have a education background and interest in Psychology, Cognitive Neuroscience, and/or substance use disorders. We primarily work with human populations. Ideally (but not necessary), a student should have previous experience/skills in neuroimaging, EEG, programing (matlab, python), or TMS.

**Project Description:** Substance use disorders (SUDs) are associated with reward-related abnormalities of the anterior midcingulate cortex (aMCC); a brain region strongly implicated in cognitive control. Notably, excessive drug use can result in aMCC hypersensitivity to drug-related rewards and hyposensitivity to natural rewards, a maladaptive process thought to bias the aMCC action-selection mechanism to favor behaviors that ultimately converge on drug use. While treatment programs for SUDs typically focus on the cessation of substance use, there is now a firm basis for treatment programs to consider interventions that target the aberrant reward and cognitive processes that sustain SUDs. However, such interventions currently do not exist. Our goal is to use a cutting-edge technology called robot-assisted image-guided transcranial magnetic stimulation (Ri-TMS), in combination with a highly sensitive electrophysiological biomarker of aMCC reward function (the reward positivity), to achieve an optimal TMS intervention for SUD. This proposal is motivated by a series of studies demonstrating that the reward positivity to be hyposensitive to monetary rewards and hypersensitive to drug-related rewards in SUD. Importantly, we were the first to demonstrate that this reward bias can be reversed in abstained smokers using Ri-TMS. These important findings suggest that (i) the reward positivity is a highly sensitive biomarker of SUD severity and treatment efficacy and (ii) modulating aMCC with Ri-TMS may correct the aberrant reward processes that sustain SUDs. We therefore propose to explore a novel, innovative Ri-TMS intervention aimed at restoring the reward function of the aMCC in SUD with the highest level of precision. In the UG3 phase, we will establish the optimal Ri-TMS parameters needed to maximize excitatory/inhibitory effects on reward-related aMCC electrophysiology. In Study 1, we will utilize powerful quantitative neuroimaging methods to construct stimulation targets based on prefrontal structure, function, and connectivity with aMCC. We will then use the

reward positivity to systematically evaluate the efficacy of the targeting protocol to enhance (Aim 1) and suppress (Aim 2) aMCC activity in nicotine dependent individuals. In Study 2, Aim 3, we will apply our optimal Ri-TMS intervention to correct the aMCC reward distortion between cigarette-related and monetary rewards in nicotine dependent individuals. In Aim 4, we will assess whether the excitatory Ri-TMS protocol has a generalizable effect in restoring the reward function of the aMCC in SUD, irrespective of their drug of choice. Our novel approach provides an unprecedented opportunity for systematic investigations of the potential role of Ri-TMS in modulating aMCC's reward function, thereby opening an exciting new era of investigative possibilities in SUD treatment. Our long-term goal is to provide treatment programs with a more relevant neurocognitive treatment option, which may increase substance users' success in treatment, maintaining abstinence, as well as achieving broader life goals.

## New Jersey

Investigator: Eileen Carry, PhD  
Institution: Zena Therapeutics Inc.  
New Brunswick, NJ  
Project Title: Development of Compound RUEC2-118, a Novel Partial GABAAR Positive Modulator, a Fast-Acting Treatment for General Anxiety and Panic Disorder, to Prevent Opioid and Benzodiazepine Overdose Fatalities  
Research: Drug Development Research  
Research Area: Drug Discovery, Chemistry, Addiction, GABAAR Receptors, Anxiety, Alcohol Withdrawal  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** A background in chemistry is preferred but not required. Previous education is not as important as an interest in drug discovery and addiction.

**Project Description:** As part of this research project the student will have introductory roles with goal of to assist with chemical characterization, laboratory and instrument maintenance, data analysis and project planning. The more specific goals of this project are uncertain but will be aimed at meeting the needs of completing the research proposed in our current Phase I NIDA STTR.

## New York

**Investigator:** Ruben Coen-Cagli, PhD  
**Institution:** Albert Einstein College of Medicine  
 Bronx, NY  
**Project Title:** Computational Tools for Assessing Mechanisms and Functional  
 Relevance of Divisive Normalization  
**Research:** Basic Research  
**Research Area:** Computational Neuroscience, Statistical Data Analysis, Visual  
 Cortex  
**Earliest Start Date:** May 15, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The intern will be proficient in Matlab and/or Python and will have a solid understanding of probability and statistics, calculus, and linear algebra. The ideal candidate will be interested in theories of neural coding, and in quantitative data analysis. The intern will not work in a wet-lab environment, all datasets will be provided by collaborators.

**Project Description:** Divisive normalization (DN) is a well-established theory of how interactions between neurons in a circuit modulate the activity of individual neurons. DN has been termed a canonical operation because it accurately describes modulations of neural activity in several brain areas by different sensory inputs, tasks, and behavioral states. Much research shows that DN can also achieve important computational objectives, and theory predicts that DN underlies behavioral gains of sensory integration and visual attention. Furthermore, impairments of sensory integration in psychiatric and neurodevelopmental disorders are thought to reflect a failure of normalization. Despite this progress, it has been difficult to tie DN to circuit and cellular mechanisms, and to quantify its impact on neural coding and behavior.

Two main obstacles have limited progress. First, most models of DN focus on trial-averaged, single-cell responses. Trial-averaging is a problem because trial-to-trial fluctuations in neural activity when the sensory input is constant (termed response variability), and how they are shared between neurons, place fundamental constraints on the information encoded by neural populations, and thus on perception. Second, normalization signals cannot be measured directly in experiments, limiting our ability to perturb and dissect mechanisms of DN and to test competing hypotheses about its functional role. Precisely monitoring and manipulating within- and across-trial fluctuations in normalization strength would therefore represent a major advance towards bridging single-neuron activity, circuit-level interactions, and behavior.

This summer research project builds on the statistical modeling framework introduced recently by this lab (termed SENS - statistical estimation of normalization signals), which revealed that single-neuron response variability and coverability in primary visual cortex (V1)

reflects across-trial fluctuations of normalization strength. To test the generality of this framework, this project will apply and compare different instantiations of the model (to encompass multiple stimulus manipulations and population sizes) on several datasets including: multiple areas of visual cortex, different brain states, stimuli, recording techniques, and species.



## New York

Investigator: Kelly Doran, MD  
 Institution: New York University School of Medicine  
 New York, NY  
 Project Title: Implementation of Overdose Prevention Practices in Permanent Supportive Housing  
 Research: Preventive Research  
 Research Area: Overdose, Homelessness, Housing, Prevention, Implementation Science, Mixed Methods, Qualitative  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

### Student Qualifications:

- Passionate about topics related to homelessness and housing as they intersect with health
- Interest in working on a study involving people who use drugs and ability to conduct work in a manner that demonstrates sensitivity and is free from stigma
- Organized and reliable
- Positive attitude, goal-directed and learns from feedback
- Quick learner – enjoys and can learn new things quickly; able to follow direction; adaptable
- Hard worker – dedicated to the job
- Proficient writer – able to write well, correctly, and quickly
- Honest – consistently acts with integrity
- Good communicator – demonstrated interpersonal, written, and oral communication skills to effectively communicate, collaborate, and establish and maintain good working relationships with a diverse group of multi-disciplinary researchers, staff, and partners
- Fully available for the duration of the NIDA Internship period.

**Project Description:** Permanent supportive housing (PSH), the gold standard intervention for ending chronic homelessness, has expanded rapidly across the U.S. Due to a confluence of individual and environmental risk factors, PSH tenants face heightened risk for overdose (OD). While evidence-based practices (EBPs) to prevent OD exist, they have not been broadly implemented in PSH settings. We propose to address this significant research to practice gap by tailoring a set of evidence-based OD prevention practices for PSH settings, then studying their implementation in 20 PSH buildings in New York. We will test a package of implementation strategies that includes an implementation toolkit, tenant-staff implementation champion dyads, limited practice facilitation, and learning collaboratives. The project will be conducted in partnership with the Corporation for Supportive Housing, a national organization that advances solutions to improve PSH through education, practice, and policy. Aim 1 is to adapt evidence-based OD prevention practices for PSH, using key stakeholder focus groups, and develop a PSH OD Prevention Toolkit to guide implementation.

In this preparation phase we will adapt an existing package of EBPs in consideration of the unique environmental characteristics of PSH and will prepare for implementation. Aim 2 is to evaluate implementation of evidence-based OD prevention practices across diverse PSH buildings and effectiveness on PSH tenant outcomes in a stepped wedge trial. In this Hybrid Type 3 effectiveness-implementation study, the primary implementation outcome is PSH building adoption of the OD prevention EBPs. We will additionally examine secondary implementation outcomes, tenant clinical outcomes, and implementation sustainment. Aim 3 is to explore multilevel factors influencing implementation—including barriers and facilitators—and refine dissemination and implementation frameworks for housing settings, using qualitative interviews with PSH staff. The research draws from the EPIS (Exploration, Preparation, Implementation, Sustainment) implementation framework and Rhodes' Risk Environment Framework. The research will inform implementation frameworks and strategies by examining the application of EPIS for PSH and testing novel housing-relevant implementation strategies including staff-tenant implementation champion dyads. Findings from this PSH-focused research are expected to be more broadly applicable to other types of housing and settings serving people experiencing homelessness. The multidisciplinary investigator team will work with a Stakeholder Advisory Board to maximize impact of the research, which has been designed to inform local and national programmatic and policy interventions.

In addition to the project described above, the Lab PI has a second NIDA-funded project that the intern may choose to be involved in. This second project is a community-partnered, mixed methods study to examine substance use and related health impacts of a large-scale initiative to place people experiencing homelessness in New York City into commercial hotels during the COVID-19 pandemic.

## New York

**Investigator:** Charles Neighbors, MBA, PhD  
**Institution:** New York University School of Medicine  
New York, NY  
**Project Title:** Person-Centered Quality Measurement and Management in a System for Addictions Treatment In New York State  
**Research:** Other Research  
**Research Area:** Substance Use Disorder (SUD) Treatment, Quality Improvement, Quality Measurement, Performance Measurement  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:**

- Interest in substance use disorder treatment, public health, and/or public policy
- Has experience and/or interests in statistics, specifically related to the development equitable and actionable metrics.
- Openness to working collaboratively and able to conduct tasks independently as needed

**Project Description:** This research project aims to create measures and methods for monitoring the quality of care in substance use disorder (SUD) treatment programs in New York State. This project represents a unique academic-government partnership and aims to inform policy and practice change. By developing and testing new quality measures, we hope to strengthen the treatment system's ability to innovate and improve in a data-driven way.

## New York

**Investigator:** Joseph Palamar, PhD, MPH  
**Institution:** NYU Langone Medical Center  
New York, NY  
**Project Title:** New Psychoactive Substance Exposure Among NYC Nightclub and Festival Attendees  
**Research:** Epidemiology Research  
**Research Area:** Club Drug, New Psychoactive Substances, Ecstasy, MDMA, Ketamine, GHB, Methamphetamine, Cocaine, Psychedelics, Nightclubs, Dance Festivals, Survey Research, Biospecimen Testing  
**Earliest Start Date:** May 30, 2024  
**Housing:** On-Campus

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

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

## New York

**Investigator:** Amanda Bunting, PhD  
**Institution:** New York University School of Medicine  
New York, NY  
**Project Title:** Development of a Novel Polysubstance Assessment Tool for Vulnerable Subpopulations  
**Research:** Behavioral Research  
**Research Area:** Community, Polysubstance Use, Criminal Justice, Assessment, Screening, Instrument Development, Opioids, Psychometrics, Vulnerable Populations  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Interns will work with human subjects, including individuals who are engaged in active drug use. Respect for research subjects and the use of person-centered language is a requirement for Dr. Bunting's lab.

Social sciences background: sociology, psychology, health services, public health

**Project Description:** Dr. Bunting's research lab is responsible for testing a new and innovative way to measure polysubstance use- the high-risk pattern of drug use when people mix more than one drug together. Polysubstance use substantially contributes to overdose risk, yet current tools are limited in their ability to measure these patterns of drug use. Interns will have the opportunity to be involved in community recruitment of vulnerable populations (e.g., individuals recently released from incarceration, persons who inject drugs) and assist research staff with study procedures to test the reliability and validity of the new tool. Interns will be included in lab meetings and learn about all lab studies.

## California

Investigator: Paul Glimcher, PhD  
Institution: New York University School of Medicine  
New York, NY  
Project Title: SOAR: Smartphones for Opiate Addiction Recovery  
Research: Basic Research  
Research Area: Opiate Use Disorder  
Earliest Start Date: June 3, 2024  
Housing: On-Campus

Student Qualifications: Basic Statistics

**Project Description:** The 5-minute battery we developed indicates the numerical probability that a patient will reuse illicit opiates within the next 7-10 days. Our primary goal in this mid-scale clinical trial is to test the hypothesis that clinicians who use the output of our mobile system to adjust buprenorphine and methadone dosing achieve lower opiate reuse rates than physicians who provide care-as-usual. Our secondary goal is to examine the usability and desirability of this solution for clinicians with an eye to usability and large-scale deployment. Our third and final goal is to measure the cost-effectiveness of this solution from multiple perspectives. If we are successful, it will be possible to employ an algorithmic and measurement-based approach to OUD treatment with methadone and buprenorphine which reduces reuse rates and relapse rates amongst OUD patients.

## New York

**Investigator:** Aaron Hogue, PhD  
**Institution:** Partnership to End Addiction  
New York, NY  
**Project Title:** Family-based Recovery Support Service Network for Youth OUD  
**Research:** Clinical Research  
**Research Area:** Family-Based Treatment, Medication for Addiction Treatment, Adolescent and Young Adult Substance Use, Dissemination and Implementation Research  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The FACTS team is seeking a Research Intern with enthusiasm and/or experience working with adolescents and families. This position is ideal for students interested in learning about family-based treatment for adolescent substance use and related behavior problems and for those seeking to develop data management and analysis skills. Spanish fluency is an asset.

**Program Description:** Partnership to End Addiction is seeking a Summer Research Intern to work in its Family and Adolescent Clinical Technology & Science (FACTS) research division. The Intern will work on a NIDA-funded multidisciplinary research collaborative dedicated to promoting family integration in treatment and recovery services for youth with opioid use disorder and other substance use disorders. See here for additional project information: <https://drugfree.org/first-research-network/>

The Research Intern will have access to archival data from several FACTS projects. It is our hope that they will develop and test a research question using basic statistical analyses with support from the FACTS team. The intern will have the opportunity to create a poster and gain poster presentation experience.

This position is hybrid, and the Research Intern will be expected to participate in team meetings via Zoom.

# New York

Investigator: Yoko Nomura, PhD  
 Institution: Queens College & Graduate Center, CUNY  
 Flushing, NY  
 Project Title: Epigenetic Susceptibility of Behavior & Addictive Disorders  
 During Pre/Pubescence after Natural Disaster Exposures in Utero  
 Research: Epidemiology Research  
 Research Area: A Longitudinal Study, Natural Disaster & Climate Change,  
 Emotional and Behavioral Regulations, Puberty, Susceptibility for  
 Subsequent Addictive and Psychiatric Disorders  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** Preference is given to candidates who are interested in transcending disciplinary boundaries and want to learn to work with a multi-disciplinary team of researchers. Relevant disciplines include (but not limited to) neuropsychology, clinical psychology, molecular biology, developmental epidemiology, behavioral epigenetics, computer sciences, cognitive & behavioral neurosciences.

Good knowledge in Spanish will be a plus.

**Project Description:** The candidate will work with the team to examine the effects of prenatal exposure to natural disaster related stress on neuro-developmental outcomes related to stress sensitivity (e.g., anxiety and reactive aggression), and executive control (e.g., inhibitory control/impulsivity, attention). The student will receive hands-on experiences in being assessment, interaction with the participants. They will learn how to make reports and produce their own poster presentation. The larger aims/hypotheses of the teams are:

H1. Prenatal SS will increase selective neurobehavioral problems (negativity, fear, anxiety, and aggression), and executive dysregulation (greater impulsivity, lower attention) as children grow.

H2. Postnatal exposure to stressors (normative stress, maternal mental health) and resources (maternal affection, social support) will continue to influence trajectories of behaviors related to anxiety, aggression, and executive control.

H3. The adverse effect of in-utero exposure to natural disaster and postnatal stress and resources jointly and differentially will accelerate/alleviate an upward trajectory of neuro-behavioral problems as children grow.

H4. Sex differences will become more distinct as children age.



H5. The socioeconomic environment (lower SES) will further amplify the adverse impact of pre- and post-natal stress on child outcomes.

## New York

**Investigator:** James Edward Swain, MD, PhD  
**Institution:** Stony Brook University  
 Stony Brook, NY  
**Project Title:** Opioids and Maternal Brain-Behavior Adaptation During the Early Postpartum  
**Research:** Behavioral Research  
**Research Area:** Maternal Brain, Functional Brain Imaging, Intersubjectivity, Empathy, Opioids  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** We anticipate interns with a keen interest and enthusiasm for the topics we are researching, highlighted by the brain-behavior mechanisms that govern parenting and may be affected by opioid use disorder and psychotherapy. Our research is exclusively non-invasive (interviews, psychotherapy, and brain imaging) and with humans. We can accommodate beginners who could assist with specific aspects of performing neuroimaging and exposure to clinical settings as well as those who already have experience with neuroimaging and clinical care for parents and substance use disorders.

**Project Description:** Our project addresses brain-behavior mechanisms in mothers affected by opioid use disorder (OUD), a fast-growing and devastating epidemic in the US, which affects a high proportion of child-bearing women, with many sufferings' comorbid mood disorders. Untreated opioid use and dependence may cause withdrawal symptoms, impair interpersonal interactions, and risk polysubstance use and neonatal abstinence syndrome. These problems are linked to child maltreatment and costly use of foster care. Buprenorphine Treatment (BT) reduces withdrawal and other harmful effects of illicit opioids for expectant mothers. However, the effects of BT on maternal neurobiology and infant-oriented behaviors are unknown. Preclinical maternal brain-behavior research and human brain magnetic resonance imaging and electroencephalography studies have supplied a maternal brain-behavior neurocircuit (MBN) to model parenting and offspring survival. The MBN includes two reciprocally modulating systems for (1) maternal caregiving, mediated by the hypothalamic medial preoptic area (mPOA), ventral tegmental area (VTA), nucleus accumbens (NAc) and ventral pallidum; and (2) maternal defensive/aggressive behaviors, mediated by periaqueductal grey (PAG). For humans, the MBN regulates flexible responses to the demands of their own infant during adaptation to the early postpartum period - such as responses to the unique, ethologically salient own-baby cry. Our preliminary work on mothers with OUD suggests both abnormalities in the MBN function.

We are examining the human MBN in a group of opioid-dependent mothers undergoing BT (n=80), as compared to non-opioid using Depression Matched Controls (MC, n=80). All participants undergo 2 neuroimaging sessions: T1 at 1-month postpartum and T2 at 4-month postpartum. Drug use and moods for all participants are assessed at these two time points.

We also combine multimodal neuroimaging methods, including functional responses to own-baby cry, gray matter volumes and resting state activity with assessments of maternal caregiving thoughts and behaviors – including measures of sensitivity and hostility – at T1 and T2. Based on our preliminary research and preclinical models we hypothesize that BT increases caregiving MBN responses to own vs. other-baby cry and such effects are linked to maternal caregiving thoughts and behaviors. We predict that T1 to T2 plastic adaptation in the MBN are affected by BT (as animal research has shown) - such that BT may interfere with normally opposing caregiving and defense subsystems of the MBN. Our subject controls consist of depression matched participants and statistical control for maternal childhood adversity, polysubstance use and offspring neonatal abstinence syndrome. Finally, we are exploring the effects of these factors on brain and maternal behaviors within the group of BT-treated mothers.

The translational potential of this project is realized by an additional NIDA project currently underway entitled "Postpartum Intervention for Mothers with Opioid Use Disorders - Brain-Behavior Mechanisms" (R61DA053688). This is a clinical trial of "Mom Power" (MP), an evidence-based 13-session psychosocial mother-child intervention proven to enhance emotionally sensitive caregiving, while concurrently reducing parental stress and depression for non-OD mothers. Beyond elucidating the effects of opioids on the neurobiology of parenting in the R01, pre/post intervention neuroimaging in this project will also elucidate whether a non-medication therapeutic intervention can improve intersubjective function and benefit mothers with OUD and how this may work in the brain.

## New York

**Investigator:** Amanda Klein, PhD  
**Institution:** University of Buffalo  
Buffalo, NY  
**Project Title:** KATP Channels as Downstream Targets of Adenylyl Cyclase's  
During Opioid Tolerance and Withdrawal  
**Research:** Basic Research  
**Research Area:** Opioid, Hyperalgesia, Adenylyl Cyclase, Potassium Channel,  
Peripheral Nervous System, Chronic Pain, Spinal Cord, Mouse,  
Signaling  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Preferred qualifications include a major in the biological sciences, and completion of general biology and chemistry labs. Career interests in either pharmacology, physiology, chemistry, or medicine and ability to learn new skills are also preferred. This research will involve working with animals and tissue samples from animals.

**Project Description:** The ultimate goals of the research program are to effectively study the mechanisms that lead to opioid tolerance and withdrawal and to establish therapeutic targets for chronic pain patients current on opioid medications. Several behavioral, electrophysiological, and imaging methods are utilized to understand the role of potassium channels before and after chronic opioid exposure.

## New York

Investigator: Jinwoo Park, PhD  
 Institution: University of Buffalo  
 Buffalo, NY  
 Project Title: The Role of the Bed Nucleus of the Stria Terminalis-  
 Norepinephrine System in Amphetamine-type Stimulant Use  
 Disorders  
 Research: Behavioral Research  
 Research Area: Roles of Brain Catecholamines (Norepinephrine and Dopamine)  
 in Methamphetamine Use Disorder  
 Earliest Start Date: May 20, 2024  
 Housing: Off-Campus

**Student Qualifications:** Although students with one year of research experience/work with animals is preferred, no prior experience is required. Students should be majoring in neuroscience, psychology, pharmacology, biology, biochemistry, or biotechnology and have an interest in the neuropharmacology of substance use disorders. Prior training in neuroscience, computer programming, or statistics is not necessary but preferred, however, students must have at least completed lab basic lab courses (e.g., general chemistry) and have general lab skills such as pipetting and using a microscope.

**Project Description:** Amphetamine-type stimulants, such as methamphetamine (METH), are highly addictive and are the second most used illicit drugs in the world. Even though ATS production in the US has dramatically increased and stimulant use remains an important public health, financial, and legal issue, there are no proven pharmacotherapies to treat ATS use disorders (AUD) due to a limited understanding of the brain circuits underlying AUD and their complex mechanisms of action. Although many ATS increase both brain norepinephrine (NE) and dopamine (DA), yet have higher affinities for the NE transporter (NET) than the DA transporter, far less attention has been paid to the role of central NE circuits as a potential treatment target for AUD.

The Goal of the Summer Research project will (i) identify anatomical and neurochemical differences in brain systems between male and female rats and (ii) characterize the effects of METH on brain catecholamine regulation and the correlation of catecholamine systems with behavioral changes using rat models. To achieve the goal, an innovative and integrative approach utilizing fast-scan cyclic voltammetry and chemogenetic modulation of target NE projection neurons in the rat brain

## New York

**Investigator:** Yuhua Bao, PhD  
**Institution:** Weill Cornell Medicine  
New York, NY  
**Project Title:** Leveraging Regulatory Flexibility for Methadone Take-Home Dosing to Improve Retention in Treatment for Opioid Use Disorder: A Stepped-Wedge Randomized Trial to Facilitate Clinic Level Changes  
**Research:** Other Research  
**Research Area:** Peer Support Services, Health Policy, Substance Use Services  
**Earliest Start Date:** May 20, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Interns should have a strong interest and commitment to improving the way we deliver services to people with substance use disorder. Interest and preparation in health policies or public policies in general is a plus. Prior experience with research is preferred but not required.

**Project Description:** Peer support workers combine lived experience of substance use and recovery with formal training to provide support services to people seeking recovery from addiction. Peer specialists are an increasingly important part of the addiction workforce. Medicaid – the largest payer of addiction services in the U.S. – covers peer support services for substance use disorder in at least 37 states but existing knowledge suggests under-utilization and ineffective use of Medicaid-covered peer support. This project will conduct a scoping review of financing mechanisms of peer support services and barriers to utilizing Medicaid coverage to finance evidence-based peer support services. Knowledge gleaned will inform ongoing analysis of the research team to understand the delivery and market structure of Medicaid-covered peer support services.

## New York

**Investigator:** Czarina N. Behrends, PhD, MPH  
**Institution:** Weill Cornell Medicine  
New York, NY  
**Project Title:** Expansion of Mail-Delivered Harm Reduction Services in the U.S.  
**Research:** Epidemiology Research  
**Research Area:** Harm Reduction, Implementation, Health Services Research  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The intern should have an interest in mixed methods substance use research and major in public health or other related health and social sciences. Experience with Excel, PowerPoint, Word, comfortable with speaking directly to study participants highly preferred. The intern should be organized, detail-oriented, and possess strong communication skills. Knowledge of harm reduction and syringe service programs not required but a plus. Interest and/or experience with qualitative research are also a plus.

**Project Description:** The summer intern will be responsible for assisting with a national online-based survey of people who inject drugs on their harm reduction utilization and access as well as acceptability and willingness to use mail-based harm reduction programs. The intern will assist with implementation, follow ups, and data management with guidance from the research team. This may involve assisting with tracking, verifying, and recording online survey and/or qualitative interview data to ensure data are complete. The intern will work closely with the PI and study personnel to review incoming data and assist with reporting out findings from the study. Interns matched to this team will have the opportunity to join the CHERISH and Syndemics Lab virtual cohort of summer interns across multiple institutions working with principal investigators conducting public health (specifically, health services / health economics) research in substance use. The summer experience will include skills building sessions with topics ranging from: 1) how to conduct a literature review, 2) online presence and networking, 3) introduction to healthcare systems, 4) introduction to healthcare policy, 5) presentation “do’s and “don’t” s, and 6) how to build a CV/resume.

## New York

Investigator: Ali Jalali, MD, PhD  
 Institution: Weill Cornell Medicine  
 New York, NY  
 Project Title: The Economic Viability and Value of Implementing an Inpatient  
 Addiction Consult Model in Public Hospital Systems for Patients  
 with Opioid Use Disorder  
 Research: Other Research  
 Research Area: Opioid Use Disorder, OUD, Substance Use Disorder, SUD,  
 Healthcare Services Research, Quality-Of-Life, Cost-  
 Effectiveness, Economic Evaluation, Health Care Costs, Health  
 Disparities, Population Health, Safety Net, Public Health,  
 Medicaid, Implementation Science, Comparative Effectiveness,  
 Evidence-Based Medicine, Budget Impact, Real World  
 Environment, Care Continuum  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Ideal candidates will have an interest in the intersections between substance use disorder research, public health, and health services research, including quantitative data analysis, economic evaluations (e.g., cost-effectiveness), and randomized effectiveness trials.

**Project Description:** This project will estimate the costs required to implement and sustain the Consult for Addiction Treatment and Care in Hospitals (CATCH) intervention for individuals with opioid use disorder (OUD) in a public hospital system and incorporate this information within an economic evaluation (i.e., cost-effectiveness analysis) study to inform real-world decision-making by stakeholders. CATCH is an addiction consult model which evaluates individuals with an opioid-related hospitalization for OUD, initiates pharmacotherapy when indicated, and directly links patients to post-discharge treatment. This study will utilize study implementation data, electronic health records and claims information as part of the analysis. The project will estimate the economic value of CATCH relative to treatment-as-usual from a Medicaid perspective.



## New York

**Investigator:** Shashi Kapadia, MD  
**Institution:** Weill Cornell Medicine  
New York, NY  
**Project Title:** Delivery of Addiction Treatment for Medicaid Enrollees with Serious Injection-Related Infections  
**Research:** Clinical Research  
**Research Area:** Substance Use Disorder, Infectious Diseases, Population Health, Medicaid, Qualitative Research, Mixed Methods Research, Endocarditis  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** A good candidate would have an interest in or experience with qualitative research methods or social science research more broadly. They should have an interest in understanding and learning about hospital-based healthcare delivery. Human-subject interactions may occur as needed in the conduct of the qualitative study. No animal or tissue work will be needed. No statistical training is needed. No bench/lab skills are needed.

**Project Description:** People who inject drugs are frequently affected by severe bacterial and fungal infections associated with injection, such as endocarditis. These infections often cause long hospitalizations, resulting in high levels of patient suffering and healthcare costs. Furthermore, patients with substance use disorders who are hospitalized are often undertreated for drug withdrawal and inadequately linked to substance use disorder treatment. In this study, the team will use a combination of quantitative administrative data and qualitative interviews to better understand the delivery of substance use disorder treatment for patients hospitalized with injection drug-related infections.

## New York

**Investigator:** Angélica Meinhofer, PhD  
**Institution:** Weill Cornell Medicine  
 New York, NY  
**Project Title:** Intergenerational Effects of America's Opioid Crisis: Parental Drug Use and Offspring Health  
**Research:** Epidemiology Research  
**Research Area:** Opioid Use Disorder (OUD), Medications to Treat OUD, Quantitative Research, Causal Inference, Quasi-Experimental Research Design, Medicaid, Claims Data, Policy Analysis, Intergenerational Effects of Parental Opioid Use, Pregnant People, Infants, Children, Families  
**Earliest Start Date:** May 27, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Ideal candidates will have an interest in quantitative research at the intersection of substance use disorders, health policy, and children and families. Statistical and database management experience, including proficiency in Stata, is required. A major in economics, public policy, public health, or a related field is required; alternatively, experience taking econometrics, policy analysis, data analysis, epidemiology, or biostatistics courses is required.

**Project Description:** Early life adversity, including in utero and early childhood, may lead to lifelong physical and mental health, substance use, and behavioral problems. This longitudinal, population-based study aims to elucidate the early and middle childhood health and healthcare outcomes of exposure to parental opioid use in early life. Results will shed light on the intergenerational effects of America's opioid crisis and inform the development of policies and early interventions for improving the well-being of children affected by parental opioid use.

Interns matched to this team will have the opportunity to join the CHERISH and Syndemics Lab cohort of summer interns across multiple institutions working with principal investigators conducting public health (specifically, health services/health economics) research in substance use. The summer experience will include skills-building sessions with topics ranging from: 1) how to conduct a literature review, 2) online presence and networking, 3) introduction to healthcare systems, 4) introduction to healthcare policy, 5) presentation "do's and "don'ts, and 6) how to build a CV/resume.

## New York

Investigator: Sean M. Murphy, PhD  
 Institution: Weill Cornell Medicine  
 New York, NY  
 Project Title: Comparative- and Cost-Effectiveness Research Determining the Optimal Intervention for Advancing Transgender Women Living with HIV to Full Viral Suppression  
 Research: Other Research  
 Research Area: Substance Use Disorder, SUD, Healthcare Services Research, Randomized Effectiveness Trials, Quality-Of-Life, Cost-Effectiveness, Comparative Effectiveness, Economic Evaluation, AIDS Prevention, Acquired Immunodeficiency Syndrome, AIDS, Medication Adherence, Medication Initiation, Behavior Therapy, Continuity Of Patient Care, Sexual And Gender Identity, HIV, HIV/AIDS, Health Care Costs, Health Disparities, Behavioral Economics, Population Health, Safety Net, Sexual And Gender Minority, SGM, Sexual And Gender Minority Health, Peer Health Navigation, Text Messaging, SMS, Public Health, Randomized Controlled Trial, RCT, End The HIV Epidemic, EHE, Social Determinants of Health, SDoH, Structural Determinants Of Health, Opioid Use Disorder, OUD, Stimulant Use Disorder, StuD  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Ideal candidates will have an interest in the intersections between HIV research, substance use disorder research, public health, and health services research, including quantitative data analysis, economic evaluations (e.g., cost-effectiveness), and randomized effectiveness trials.

**Project Description:** Our team previously worked on separate projects utilizing Peer Health Navigation (PHN) and SMS (i.e., text messaging) for advancing trans women living with HIV to full viral suppression. Though the effectiveness of both interventions has been established, their comparative effectiveness, required resources/costs, cost-effectiveness, and heterogeneous effects on subgroups, including those with substance use disorder (SUD), have not been evaluated. Given the many negative personal- and public-health consequences of untreated/undertreated HIV, and that HIV services for trans women are frequently delivered in resource-limited, community-based settings, a comprehensive economic evaluation is critical to inform decisions of stakeholders, such as providers, insurers, and policymakers.

The study will implement a randomized controlled trial, randomizing participants into 1) PHN alone, 2) text messaging (SMS) alone, or 3) PHN+SMS.

The specific aims are to:

- 1) Conduct a comparative effectiveness research trial to determine the relative effectiveness of PHN vs. SMS vs. PHN+SMS in terms of:
  - a) Primary - virologic suppression
  - b) Secondary outcomes - HIV Treatment Adherence Self-Efficacy Scale scores
  - c) the AIDS Health Belief Scale scores
  - d) the Inventory of Socially Supportive Behaviors scores
  - e) urine drug screen results
- 2) Identify the resources required to prepare for, implement, and sustain each intervention, and estimate the associated costs
- 3) Conduct a comprehensive cost-effectiveness analysis to determine the relative value of each intervention from the healthcare-sector, state-policymaker, and societal perspectives

Secondary aims are to:

- 1) Determine heterogeneous intervention effects across interventions due to social and structural determinants of health and individual-level characteristics

## New York

**Investigator:** Bruce R. Schackman, PhD  
**Institution:** Weill Cornell Medicine  
New York, NY  
**Project Title:** Health Economics of Substance Use Disorder, HCV, and HIV  
Treatment: Evaluating Intervention Outcomes for Individuals,  
Systems, and Communities  
**Research:** Epidemiology Research  
**Research Area:** Policymaker/Stakeholder Research, Policy Analysis, Opioid Use  
Disorder (OUD), Opioid Overdose, Claims and Managed Care  
Data, Data Completion, Large Data, Public Health Data, Health  
Services Utilization, Hepatitis C Virus (HCV), HIV  
**Earliest Start Date:** May 27, 2024  
**Housing:** Off-Campus

**Student Qualifications:** The candidate should have strong organizational skills, attention to detail, and the ability to manage and synthesize data collected from multiple sources. A professional demeanor when communicating with colleagues and stakeholders is necessary. An interest in social and behavioral science related to substance use is preferred.

**Project Description:** The summer intern will join the CHERISH (Center for Health Economics of Treatment Interventions for Substance Use Disorder, HCV, and HIV), a NIDA-funded national center of excellence, and make contributions in 2 areas. The first is to contribute to ongoing literature reviews, which may involve searching the literature for relevant papers and abstracting data from these papers to support ongoing CHERISH research projects (for example, assigning costs to criminal behavior). The second is to work with the CHERISH Consultation Service, which assists researchers interested in incorporating economic analyses into their current or future research. The Consultation Service supports researchers with the design, implementation, interpretation, dissemination, and translation of economic evaluations alongside observational and interventional studies of substance use disorder and related conditions. For this second project, the summer intern will contribute to quality improvement efforts as part of improving services to the research community.

## Ohio

Investigator: Alan D. Levine, PhD  
 Institution: Case Western Reserve University  
 Cleveland, OH  
 Project Title: CWRU Center for Excellence on the Impact of Substance Use on HIV  
 Research: Basic Research  
 Research Area: Opioid Use Disorder, Opioid Receptor Signal Transduction, Opioid Effects on Human T Lymphocytes, Opioid Regulation of Immune Function, Fentanyl Signaling in The Context of Polysubstance Use, Fentanyl Induced Gene Expression in Human Neurons, Role of P450 Pathway on Fentanyl Dependence  
 Earliest Start Date: May 13, 2024  
 Housing: On-Campus

**Student Qualifications:** Junior and above / some lab experience in cell or molecular biology / Major in biology, chemistry, biochemistry, neuroscience / Goal to remain in biomedical research / Primary cell culture of human immune cells and brain cells.

### **Project Description:**

1. Opioid Receptor Signal Transduction in human Induced Pluripotent Stem Cell-derived neurons: Define the biochemical events through the G protein and beta-arrestin pathways induced by fentanyl and other opioid receptor agonists: Western blot, cell culture, immunofluorescence microscopy.
2. Bioinformatic analysis of changes in gene expression and resulting pathways in human Induced Pluripotent Stem Cell-derived neurons: Cell culture, RNA isolation, RNA sequencing, bioinformatic 'big data' analysis.

## Ohio

**Investigator:** Nichole Michaels, PhD, MPH  
**Institution:** Nationwide Children's Hospital  
Columbus, OH  
**Project Title:** Evaluating the Impact of Fentanyl Test Strip Use Among Rural and Urban Populations  
**Research:** Preventive Research  
**Research Area:** Substance Use Disorders, Harm Reduction, Overdose Prevention, Public Health, Fentanyl Test Strip Education  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** No previous research experience required. Preferred majors and career interests include public health, sociology, psychology, biology, social work, etc. Our research works with human subjects, the student may be interacting directly with study participants in-person or over the phone.

**Project Description:** This study investigates the distribution of fentanyl test strips (FTS) and education on FTS uses as a harm reduction strategy to prevent overdoses among people who use drugs. FTS use is a promising harm reduction strategy and research shows when people who use drugs receive a positive result, they are more likely to perform overdose risk reduction behaviors. However, access to FTS is limited, and there are barriers to the adoption of this intervention in some communities. The purpose of this study is to investigate the feasibility, acceptability, and associated benefits and harms of integrating FTS education and distribution into select Project DAWN sites in rural and urban communities in Ohio. Researchers' roles include recruitment of participants at Project DAWN sites, communication with drug courts around Ohio, participating sites, and study participants. Researchers also administer the study's intervention and collect participant data.

## Ohio

**Investigator:** Jason Blackard, PhD  
**Institution:** University of Cincinnati College of Medicine  
Cincinnati, OH  
**Project Title:** Omics Analysis of HIV During Synthetic Opioid Exposure  
**Research:** Basic Research  
**Research Area:** HIV, Opioid, Fentanyl, Viral Diversity, Transcription Factor,  
MicroRNA, Transcriptome  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

**Student Qualifications:** Previous experience in a molecular biology laboratory is preferred. Biology / biochemistry majors preferred. Interns may work with virus-infected samples after appropriate training but will not be responsible for patient recruitment or enrollment. Animal studies are not part of this research.

**Project Description:** The US is amid a major opioid epidemic largely attributed to synthetic opioids. For example, fentanyl is 50-100 times more potent than heroin and is involved in >60% of overdoses nationwide and >90% of overdoses in Ohio. Individuals with opioid use disorder are at significant risk for transmission of HIV, and new cases of HIV are on the rise in the Midwest and at our institution. Opioid receptors are expressed in a variety of cell types that are susceptible to HIV infection. Commonly abused opioids promote HIV replication and virus-mediated pathology. Thus, translational research on virus-opioid interactions is essential for optimized treatment and limiting viral reactivation. Important knowledge regarding how synthetic opioids influence HIV latency and reactivation is absent from the available literature.

To fill this critical gap and institute a major shift forward in our understanding of this epidemic, our lab is conducting a series of complementary in vivo studies to directly evaluate the impact of synthetic opioids on markers of HIV latency/reactivation, viral diversity, transcription factor expression, microRNA expression, and cell signaling pathways.



## Oklahoma

Investigator: Evan J. White, PhD  
 Institution: Laureate Institute for Brain Research  
 Tulsa, OK  
 Project Title: Kipiyecipakiciipe "Coming Home": Establishing Clinical Cultural Neuroscience as a Tool for Understanding the Role of Traditional Cultural Engagement in Mitigating Substance Misuse and Disorder  
 Research: Behavioral Research  
 Research Area: Community-Based Participatory Research, Substance Use Disorder, American Indian/Native American/Indigenous, Clinical Neuroscience, Cultural Protective Factors  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Interns should have a goal for a career in research and experience with Qualitative data collection/analysis, Experience with Quantitative data analysis, experience with EEG or fMRI data collection, management, cleaning, and experience presenting research, Major: psychology, neuroscience, biology, computer science, or related fields. Shadowing opportunities will be available for human subject research visits. Interns will not be expected to run human subjects research protocols.

**Project Description:** American Indians (AI) suffer from a disproportionate burden of negative health and social consequences of substance use disorder (SUD), yet after decades of recognition and research, there is surprisingly little scientific understanding of why this is the case. Research in AI communities has demonstrated that traditional cultural engagement (TCE) is protective against, and aids in, resolving substance use disorders, but to date the underlying mechanisms of these salutogenic effects are unknown. In partnership with the Shawnee Tribe, this project aims to integrate community-based participatory research and neuroscience tools to delineate the impact of TCE on risk and resilience for SUD and establish a novel framework for studying analogous cultural features in other populations as social determinants of health to advance health equity. A community advisory board of Shawnee adults will oversee the design, implementation, and interpretation of the study. A three phased approach will be used to provide a multi-level understanding of TCE as a protective SDH. Phase 1 will consist of focus groups aimed at refining a conceptualization of TCE specific to the ST to provide deep conceptual validity for behavioral probes and stimuli for neural probes of TCE. Phase 2 will examine neural probes of TCE and neurobehavioral and cognitive risk factors for SUD across individuals with varying degrees of TCE as defined by the CAB. Phase 3 will extend results to a sample of individual with SUD and healthy controls.

# Oregon

Investigator: Ashli Sheidow, PhD  
 Institution: Chestnut Health Systems' Lighthouse Institute  
 Bloomington, IL  
 Project Title: Building a Lasting Foundation to Advance Actionable Research  
 on Recovery Support Services for High-risk Individuals with  
 Opioid Use Disorder: The Initiative for Justice and Emerging  
 Adult Populations (The JEAP Initiative)  
 Research: Behavioral Research  
 Research Area: Services Research, Recovery Support Services, Community-  
 Based Participatory Research, Criminal Legal System Involved  
 Populations, Emerging Adult Populations  
 Earliest Start Date: May 13, 2024  
 Housing: Off-Campus

**Student Qualifications:** Required Qualifications:

- Personal or professional interest in substance use disorders, recovery support services, or the justice system

Preferred Qualifications:

- Lived experience (your own or through people with whom you are close) with one or more of the following: recovery from substance use, former involvement with the adult criminal justice system, former involvement with the juvenile justice system
- Strong attention to detail
- Skills and experience in one or more of the following: conducting literature reviews, drafting documents and summaries of other documents, creating materials for summarizing lengthier information, graphic design

**Project Description:** Recovery support services for people experiencing substance use disorder are multiplying, but there is little research on what makes these services effective. The JEAP Initiative is working to change that. Join the JEAP Initiative project at the Chestnut Health Systems' Lighthouse Institute that aims to advance research on the effectiveness of recovery support services for adults with substance use disorders and focuses on (1) young adults and (2) adults of all ages involved with the justice system. Bringing together research expertise and lived experience leads to better research. For this reason, lived experience is at the heart of all activities of the JEAP Initiative. Lived experience is a preferred qualification for this internship and for all other positions on the team. In addition, all activities of the JEAP Initiative are guided by Community Boards made up of individuals in recovery, justice-impacted individuals, providers, and payors. For more information about the JEAP Initiative, visit <https://www.jeapinitiative.org/>

Established in 1986, Lighthouse Institute is the research branch of Chestnut Health Systems. Our goal is to assist practitioners in raising the caliber of their offerings by means of publications, training, and research. Staff members of the Lighthouse Institute provide

applied research, program evaluation, training, and consultancy to health and human service organizations through numerous projects nationwide.

Learn more here: <https://www.chestnut.org/>

# Pennsylvania

Investigator: Ellie Gordon, PhD, MPH  
 Institution: Behavior, LLC  
 Pittsburgh, PA  
 Project Title: Modeling Physiology and Behavior of Veterans to Avert Opioid  
 Related Mortality Through Timely Intervention  
 Research: Clinical Research  
 Research Area: Physiological and Behavioral Data, Wearable Platform,  
 Smartphone/Smartwatch, Cravings, Substance Use Disorder  
 (SUD), Addiction, Return to Use (RTU-Relapse), Overdose  
 Prevention, Crisis Prediction Via AI/Machine Learning, Mobile  
 App and Web Dashboard, Crisis Prevention, Mental Health, and  
 Recovery Support  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** Interns pursuing degrees in fields such as health Sciences, behavioral, clinical, and social sciences, or a related discipline.

- Exposure to data organization, and optionally data analysis techniques.
- Able to work with and potentially assist others with using technology tools such as smartphone apps and smart watches. Comfortable using data security protocols to access and utilize secure, cloud-based spreadsheets, and related.
- Comfortable working in clinical settings and participating in recruitment efforts, including community outreach, and communicating directly with individuals with a SUD via in person, phone, and virtual means.
- Effective communication skills and ethical awareness. Willing and able to complete CITI training.
- Strong organizational and problem-solving skills, ability to think critically, and attention to detail.
- A passion for contributing to impactful research projects, especially those related to healthcare and public health.

**Project Description:** The opioid epidemic has reached alarming proportions, with high use or return to use (relapse) rates and a record number of overdose deaths in recent years. This crisis is particularly relevant among United States veterans, who face unique challenges that increase their susceptibility to opioid addiction and overdose. Despite the pressing need for intervention, many veterans are reluctant to seek help. To address this, Behavior has developed an individualized return to use prevention tool that can be used as a standalone solution or in conjunction with existing treatments.

The primary goal of this research project is to develop and implement a novel remote monitoring and intervention system that leverages machine learning to assess the physiological and behavioral data of veterans at risk of opioid misuse and overdose. The

recruitment of participants plays a pivotal role in achieving this project's objectives. By enrolling veterans who have experienced opioid-related challenges, we ensure that our research and interventions are grounded in real-world experiences and tailored to the needs of those at risk. The insights gained from their participation significantly contribute to the development and validation of our remote monitoring and intervention system. Phase I of the project focused on data collection and model development, regarding wearable sensor data and behavioral data from veterans and machine learning models to predict opioid cravings and risk of return to use. Phase II involves the implementation of individualized models for real-time prediction of cravings, along with the evaluation of intervention strategies. This comprehensive approach aims to prevent drug-related mortality among veterans by leveraging physiological and behavioral data using a remote monitoring and intervention system.

# Pennsylvania

Investigator: Wenzhe Ho, MD, MPH  
 Institution: Temple University  
 Philadelphia, PA  
 Project Title: HIV, Methamphetamine and Human iPSC-derived Microglia-containing Cerebral Organoids  
 Research: Other Research  
 Research Area: Drug Abuse, HIV, Neuro AIDS, Viral Immunology, Innate Immunity, iPSC, Cerebral Organoids  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** Prefer to have students with a biology major, having a great interest and passion in research (with or without experience, although research experience is preferred). Students are expected to be a good listener and observer who can follow instructions, pay attention to details, and get along with others. They should have the ability to organize/present experimental data. In addition, students should have excellent communication skills, and are able to read research papers and write in English.

**Project Description:** METH, a potent addictive psychostimulant, is one of the most abused drugs in the United States. METH abuse is highly prevalent in HIV-infected individuals, which presents unique challenges for HIV prevention and treatment. Given the overlapping impact of METH use and HIV on neuronal damage in the CNS, it becomes urgent to understand the role of interplays between METH and HIV in the pathogenesis of HIV-associated neurocognitive disorders (HAND). The goal of this project is to address the hypothesis that METH use and/or HIV infection inhibit host innate immunity and facilitate inflammation. There are two specific aims: 1. To examine whether METH and/or HIV inhibit the intracellular viral restriction factors in newly established brain cell models (iPSC-derived microglia and Microglia-containing Cerebral Organoids, MCOs). 2. To determine whether METH and/or HIV infection induce expression of the inflammasomes/neurotoxic factors and promote the death of neurons.

## Pennsylvania

Investigator: Meg Fox, PhD  
Institution: The Penn State College of Medicine  
Hershey, PA  
Project Title: Circuit-Specific Molecular Mechanisms in Fentanyl Use and Relapse  
Research: Basic Research  
Research Area: Mouse Model, Opioids, Reward Circuitry, Molecular Biology, Self-Administration  
Earliest Start Date: May 20, 2024  
Housing: Off-Campus

**Student Qualifications:** The intern should be detail oriented with excellent time management and fine motor skills and can follow instructions and work independently. The intern should be comfortable working with animals and animal tissue samples; experience working with mice is a bonus but not required. The intern should be broadly interested in Biology or Neuroscience and have completed at least some introductory biology coursework. Those without research experience from underrepresented backgrounds (broadly defined) are especially welcome.

**Project Description:** The summer research project is focused on how different molecules in specific brain reward regions influence opioid-seeking behavior. First, mice are trained to self-administer fentanyl intravenously in operant conditioning chambers. After self-administration training, mice then receive viral vectors in the brain to increase or decrease expression of certain genes in specific brain regions. After a period of drug abstinence (mimicking incarceration or substance use treatment in humans), mice are tested for drug-seeking behavior. This project is part of a larger endeavor focused on identifying how changes in gene expression led to persistent opioid use in individuals with Opioid Use Disorder.

# Pennsylvania

Investigator: Taylor Scott, PhD  
 Institution: The Pennsylvania State University  
 University Park, PA  
 Project Title: Building the Science of Improving Evidence-Informed Prevention Policy  
 Research: Preventive Research  
 Research Area: Translational Science, Prevention Science, Substance Use Prevention, Communication Science, Use of Research Evidence in Policymaking, Randomized Control Trial  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** Depending on intern preference for their role, preferred qualifications would include strong communication, team working, and organization skills, as well as fair familiarity with basic software (e.g., Zoom). Students would be working with humans or human subject data.

**Project Description:** Through the Building the Science of Improving Evidence Informed Prevention Policy the research aims to

- 1) Map the state substance misuse prevention policy landscape
- 2) Evaluate the effectiveness of RPC on policymaker engagement, value, and awareness of substance misuse prevention science,
- 3) Assess Research-to-Policy Collaboration (RPC) impact on use of evidence in the state substance misuse prevention policymaking

The study aims to test the effectiveness of the RPC at the state level through a randomized controlled trial. The RPC is a model to increase the use of research evidence through facilitating capacity of and connections between scholars and policymakers. 15 of the total 30 states included in the study will be randomized to the intervention and 15 to the control conditions. The RPC involves the identification of policymakers' legislative priorities, and an assessment of their use and value of evidence-based research in their legislative efforts. Facilitated collaborations between scholars and policymakers are fostered to support the translation of research evidence that meets legislative priorities. The study will involve a mixed methods approach to identify the state of substance misuse prevention policy landscape, analyses of self-reported and observed use of research evidence (through survey data and policy analyses), and a cost-effectiveness analysis of the model.



# Pennsylvania

Investigator: Mudit Tyagi, PhD  
 Institution: Thomas Jefferson University  
 Philadelphia, PA  
 Project Title: Characterization of Cocaine-Induced Signaling Pathways that Enhances HIV Transcription  
 Research: Basic Research  
 Research Area: Impact of Drugs of Abuse and/or HIV In Accelerating Aging Process by Facilitating Perpetual Immune Activation and Inflammation  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** We are looking for a motivated undergraduate student with basic knowledge of biology, who is interested in research.

## **Project Description:**

**TITLE:** Assessing the impact of cocaine and/or HIV in accelerating aging process by facilitating perpetual immune activation and inflammation.

**OVERALL GOAL OF THE PROJECT:** The overall focus of the study is to identify and characterize the impact of cocaine and HIV on inflammatory, immune activation and aging markers, as indicators of premature aging process due to HIV infection and/or cocaine use. The biomarkers of inflammation and immune activation will be studied at protein, genetic and epigenetic level.

**RATIONALE:** Current anti-HIV therapy is unable to restrict HIV protein generation. Viral proteins, mainly Tat, Nef and Gp120 are known to stimulate pro-inflammatory cytokines levels in the CNS, which subsequently activate brain resident and migratory circulating cells. Activated resident brain cells, mainly microglia and astrocytes, and visiting perivascular macrophages and T cells, release several neurotoxic factors and inflammatory mediators that result in neuronal deterioration and dysfunction. These events contribute to neuroinflammation and cognitive impairments in HIV patients. As we and others have shown that cocaine intake further aggravates this situation given cocaine augments CNS viral load by inducing HIV replication and transmission. In addition, cocaine also increases HIV gene expression by activating transcriptional factors, including NF- $\kappa$ B, and consequently enhancing viral protein levels both systemically and in the CNS. This indicates that cocaine exposure augments inflammation by upregulating both the levels of HIV proteins and NF- $\kappa$ B activation. NF- $\kappa$ B is known to directly stimulate the transcription of numerous pro-inflammatory cytokine genes. Moreover, the immune response against HIV virions and its proteins results in perpetual immune activation. Continuous immune activation has been shown to promote CNS deterioration, which is another indicator of aging. We therefore hypothesize that cocaine-using HIV+ individuals will have higher levels of inflammatory and immune activation

markers in their plasma than do HIV+ individuals who do not use any illicit drug (Uninfected < HIV infected < HIV infected + cocaine). In support of this hypothesis, it has recently been demonstrated that pretreatment of mice with cocaine results in an increased expression of inflammatory cytokines and enhanced HIV infection.

## Pennsylvania

Investigator: Kyle M. Kampman, MD  
Institution: University of Pennsylvania  
Philadelphia, PA  
Project Title: Pregabalin Plus Lofexidine for the Outpatient Treatment of  
Opioid Withdrawal  
Research: Clinical Research  
Research Area: Addiction Medicine and Psychosocial Treatment  
Earliest Start Date: June 3, 2024  
Housing: On-Campus

**Student Qualifications:** Students should be interested in the clinical biopsychopharmacology of addiction medicine or other related health fields.

**Project Description:** Students who participate in this internship will engage in active clinical research with a supervising mentor. They will learn the fundamentals of research in addiction medicine and will be given a topic to pursue as part of their final oral presentation. The University of Pennsylvania is one of the top research universities in the addiction field.

## Pennsylvania

Investigator: Dirk Trauner, PhD  
Institution: University of Pennsylvania  
Philadelphia, PA  
Project Title: Genetically-Targeted Photo-Pharmacology for Native Opioid Receptors  
Research: Basic Research  
Research Area: Chemical optogenetics, photopharmacology  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** A background in multistep chemical synthesis and, ideally, electrophysiology.

**Project Description:** We aim to develop molecular photo switches that can activate MOR and 5-HT<sub>2A</sub> receptors with red light.

# Pennsylvania

Investigator: Renee Cloutier, PhD  
 Institution: University of Pittsburgh  
 State College, PA  
 Project Title: HEALing Measurement Center: Enhancing Opioid Use Disorder  
 Recovery through Measurement Based Care  
 Research: Behavioral Research  
 Research Area: Implementation Science, Community-Engaged Research,  
 Measurement-Based Care, Hybrid Effectiveness-Implementation  
 Study, Psychosocial Interventions, Substance Use Treatment,  
 Opioid Use Disorder, Opioid Overdose, Opioid Treatment  
 Programs, Mixed Methods, Measure Design, Intervention  
 Development and Adaptation  
 Earliest Start Date: June 3, 2024  
 Housing: On-Campus

**Student Qualifications:** An educational background in psychology, public health, data science, or statistics/quantitative methods is preferred, however no prior research experience is needed for this internship. This project would be particularly relevant for interns interested in graduate training and/or a career in clinical psychology, sociology, social work, public health, implementation science, data science, user experience testing, or digital mental health. This project will require students to work with human participants. Familiarity with Microsoft Word and Excel is needed, along with strong organizational and communication skills.

**Project Description:** Summer interns will have the opportunity to participate in the first of a three-phase research project to enhance the measurement, quality, and equity of care delivered into 20 Pennsylvania community opioid treatment programs (OTPs) through sustained implementation of measurement-based care (MBC). Measurement-based care is an evidence-supported intervention that involves a counselor administering a self-report symptom measure to clients, reviewing measure scores, and discussing the clients' responses in a counseling session. Measurement-based care has not been well-studied in community opioid treatment programs, so this project leverages the University of Pittsburgh Program Evaluation & Research Unit's existing community partnerships with the Pennsylvania Centers of Excellence – a state-initiated program focused on enhancing holistic treatment for opioid use disorder through care coordination of MOUD, physical health care needs, mental healthcare needs, social determinants of health needs, and peer supports. To foster partnership and engagement at the state, site, provider, and patient level the Contact MPI is collecting mixed methods data (observational, qualitative interviews, quantitative surveys) from leaders, counselors, and clients to understand: a) barriers to measurement-based care use; and b) potential ways that measurement-based care should be adapted to fit the needs of counselors providing treatment for opioid use disorder. This data will be analyzed and used to generate an MBC Implementation Blueprint that will be implemented and tested in opioid treatment programs in a stepped wedge design across years 2-5. The Contact MPI will also be

working with industry partners on refining the design and data architecture for the MBC tool/software and back-end data system for both clinical and research purposes.

# Pennsylvania

**Investigator:** Walid Gellad, MD, MPH  
**Institution:** University of Pittsburgh  
Pittsburgh, PA  
**Project Title:** Machine-Learning Prediction and Reducing Overdoses with EHR  
Nudges (mPROVEN)  
**Research:** Epidemiology Research  
**Research Area:** Machine Learning, Risk Prediction, Algorithms, Electronic Health  
Record (EHR), Overdose Prevention, Primary Care, Behavioral  
Nudges, Opioids, Public Health, Substance Use Disorder  
**Earliest Start Date:** June 3, 2024  
**Housing:** On-Campus

**Student Qualifications:** Candidate should have an interest in public health, epidemiology, overdose prevention, community-based interventions, and implementation science. Since this project involves big data, it's helpful but not necessary if the intern has experience with statistics and data analysis. Other preferred qualifications include word processing, spreadsheet, and presentation creation skills; experience with or interest in writing scientific papers and searching existing literature for relevant research; ability to work independently and collaboratively.

**Project Description:** This project aims to reduce opioid overdoses and potentially unsafe opioid prescribing using a machine learning-based risk prediction model combined with behavioral nudges that will appear in the electronic health record (EHR). The research team is developing an algorithm that predicts risk of opioid overdose using electronic medical record data, designing and pilot testing a nudge intervention in the EHR and conducting a randomized clinical trial of the algorithm and nudge in primary care practices to see how the intervention affects prescribing practices and important outcomes for opioid safety.

# Pennsylvania

**Investigator:** Jane Liebschutz, MD, MPH  
**Institution:** University of Pittsburgh School of Medicine  
 Pittsburgh, PA  
**Project Title:** Collaborative Care for Polysubstance Use in Primary Care  
 Settings (Co-Care)  
**Research:** Biomedical Human Subjects  
**Research Area:** Addiction Treatment and Prevention, Harm Reduction, Health  
 Disparities  
**Earliest Start Date:** May 1, 2024  
**Housing:** On-Campus

## **Student Qualifications:**

- Major: pre-med/biomedical, pre-pharmacy, social work, or other related healthcare field
- In good academic standing
- Ability to work with interdisciplinary team of researchers, faculty, clinicians, and other healthcare administrators and professionals

**Project Description:** Summer interns will be given the opportunity to work on a variety of interdisciplinary projects. One study, Co-Care, will be part of the summer intern's portfolio. Co-Care's description is: Although primary care settings can be an ideal context for identifying unhealthy polysubstance use and initiating treatment, in practice few patients are identified, and effective, feasible, evidence-based treatment models are lacking. To address this gap, study investigators plan to test a collaborative care (CC) intervention for patients with complex needs and heightened overdose risk, such as that posed by concurrent use of opioids with sedatives, stimulants, or alcohol. Study aims include 1) testing the effectiveness of the CC intervention for reducing days of polysubstance use over 6 months (primary outcome), and 12 months (secondary outcome) and 2) examining the impact of the CC intervention on the following secondary outcomes: problems related to substance use, SUD severity, overdose risk behavior and events, health-related quality of life, mental health symptoms, receipt of addiction treatment, primary care engagement, and acute care utilization.



# Pennsylvania

**Investigator:** Emily Dauria, PhD, MPH  
**Institution:** University of Pittsburgh, School of Medicine  
 Pittsburgh, PA  
**Project Title:** Technology Enhanced Substance Use and HIV Service Navigation  
 for Justice-Involved Young Adults  
**Research:** Behavioral Research  
**Research Area:** Criminal Legal Systems, mHealth, Young Adult, Intervention  
 Research, Implementation Science, Substance Use, Peer  
 Navigation, Human Centered Design  
**Earliest Start Date:** May 6, 2024  
**Housing:** On-Campus

**Student Qualifications:** Preferred qualifications for this internship focused on human behavioral research include high school graduate; excellent computer and word processing skills; investigative, data analysis, and reporting skills; superior documentation skills; ability to set priorities, work both independently and collaboratively; service oriented and responsive to questions and requests; excellent organization skills; detail oriented; excellent punctuality, attendance, and reliability.

**Project Description:** Funded by the National Institute on Drug Abuse, the goal of this project (LYNX) is to connect young folks (18 to 29 years) surveilled by the criminal legal system to community-based HIV-prevention and substance use treatment services using peer navigation and a codeveloped web-based application.

There is a strong scientific premise for the study of integrated Substance Use Disorders (SUDs) and HIV-prevention interventions for criminal legal involved (CLI) populations. The syndemic risks for incarceration and HIV acquisition are strongly correlated because of both structural (e.g., healthcare access, community deprivation, racism) and individual (e.g., sexual and substance use behaviors) level factors. Estimates of the proportion of the CLI-population with a SUD reach 72%, and ~150,000 persons with HIV pass through a jail or prison annually, representing 16% of individuals living with HIV. To date, few published studies have examined integrated PrEP and SUD service access among CLI populations. Our team's ongoing work with CLI women (San Francisco, CA) has identified participants' having a strong interest in participating in a navigator-led program to link them to PrEP-related services and, among young participants (i.e., those aged 18 to 29 years), an interest in using eHealth to support these navigation services. Navigation uses a one-on-one relationship to support individuals to move through health services by eliminating barriers and have successfully increased healthcare access for CLI HIV-positive adults and individuals with SUDs. eHealth approaches to SUD and HIV prevention also hold promise because they improve access to effective health services, particularly for younger people.

The aims of this study are to:

- 1) Develop the content and structure for peer navigation services and a web-based app, to refer and link CLI young adults (aged 18 to 29 years) to substance use treatment and HIV-prevention services
- 2) Build and pilot the navigation service and app with 10 young adults and refine the program based on their feedback
- 3) Identify whether the program improves linkage to HIV-prevention and substance use treatment services for CLI young adults. This is a mixed-methods study (e.g., focus groups, interviews, surveys) that employs community-based, participatory, and user-centered design research methods.

## Rhode Island

Investigator: Justin Berk, MD, MPH  
 Institution: Brown University  
 Providence, RI  
 Project Title: Injectable Extended-Release Buprenorphine (XR-B) in a  
 Correctional Setting: A Pilot Randomized Controlled Trial  
 Research: Clinical Research  
 Research Area: Opioid Use Disorder, Addiction, Buprenorphine, Carceral  
 Healthcare, Criminal Legal System  
 Earliest Start Date: May 27, 2024  
 Housing: Off-Campus

**Student Qualifications:** An ideal intern will be a pro-active and willing to troubleshoot and problem-solve independently with support when needed. They will have compassion for all individuals including those that are the focus of our research: individuals with addiction and individuals who are incarcerated. They will have an interest in supporting communities and people that are often marginalized by society. Writing skills, a major plus. If they have previous research experience, that is a plus but so long as they are willing to invest the effort to work on developing skills with mentorship, we can support a range of student education levels. Specific skill sets in R or statistics can be utilized. People with lived experience, family incarcerated experiences, and/or addiction are encouraged to apply.

**Project Description:** The research project will have multiple options for an intern that will include conducting qualitative analysis from interviews with incarcerated individuals and carceral stakeholders, working to design and implement a clinical trial in a carceral setting, and/or working on related projects to improve healthcare delivery in a jail and prison setting. Other projects may relate to hepatitis C treatment in jails settings, nursing home availability projects for incarcerated individuals, an environmental scan of facility research projects, or other high-impact work in healthcare delivery in carceral settings. The research goals will be to ensure the intern has broad experiences, gains exposure to criminal legal system issues, and presents a poster at an academic conference. The project will include opportunities to collaborate with the Center for Health and Transformative Justice, the COBRE for Opioids and Overdose, and other possible opportunities through the Brown School of Public Health.

## Rhode Island

**Investigator:** Lauren Micalizzi, PhD  
**Institution:** Brown University  
Providence, RI  
**Project Title:** Prenatal Tobacco Exposure: Self-Regulatory Pathways to Externalizing Behaviors  
**Research:** Behavioral Research  
**Research Area:** Maternal Smoking During Pregnancy, Adolescent, Substance Use, Externalizing Behavior, Development  
**Earliest Start Date:** May 15, 2024  
**Housing:** On-Campus

**Student Qualifications:**

- 1) Strong verbal and written communication skills; excellent interpersonal and organizational skills; attention to detail; maturity, and responsibility
- 2) Comfort and willingness to work with families from low-income and/or diverse populations required
- 3) Demonstrated ability to work independently, prioritize tasks, perform multiple tasks efficiently and accurately, take initiative and maintain organized working conditions required
- 4) Openness to and interest in learning new skills

**Project Description:** This longitudinal study of 100 mother/child dyads examines self-regulation problems as pathways that lead to substance use and other behavior problems for children who were exposed to smoke during the prenatal period. Dyads took part in a large smoke exposure study ~15 years ago; for the current study, participants attend 3 visits to a behavioral laboratory at Brown University over the course of one year. Participants complete computerized neurocognitive assessments, ECG, substance use interviews, and self-report on a range of behaviors (e.g., parenting) and contexts (e.g., household chaos). Data collection and analysis will be ongoing during the internship period.

## Rhode Island

**Investigator:** Cara Murphy, PhD  
**Institution:** Brown University  
Providence, RI  
**Project Title:** A Multiple Health Behavior Change Intervention for Overweight and Obese Smokers  
**Research:** Clinical Research  
**Research Area:** Health Behavior Change, Multiple Health Behavior Change, Intervention, Self-Regulation, Randomized Controlled Trial, Obesity, Harm Reduction, Smoking Cessation, Weight Gain Prevention, Behavioral Economics  
**Earliest Start Date:** June 10, 2024  
**Housing:** On-Campus

**Student Qualifications:** Preferred qualifications include someone who is curious and eager to learn! It would also be beneficial to have strong communication and interpersonal skills, the ability to work independently and as part of a team, and the ability to develop rapport with research participants. Experience with data analysis and academic writing preferred but not required!

**Project Description:** Program of research involves working with individuals with obesity who smoke cigarettes and testing interventions to reduce harm and promote health. Research is conducted remotely with participants across the US. Interventions are testing in novel orders and in novel combinations to learn the most effective ways to promote quitting smoking and to limit the weight gain that is typically associated with quitting smoking.

## Rhode Island

Investigator: Rosemarie Martin, PhD  
 Institution: Brown University  
 Providence, RI  
 Project Title: Using Implementation Interventions and Peer Recovery Support to Improve Opioid Treatment Outcomes in Community Supervision  
 Research: Behavioral Research  
 Research Area: Public Health, Behavioral Sciences, Addiction, Substance Use Disorder, Opioid Use, Opioid Use Disorder, Medications to Treat Opioid Use Disorder, Criminal Legal System, Community Supervision, Qualitative Data Analysis, Randomized Controlled Trial, Human Subjects Research  
 Earliest Start Date: May 27, 2024  
 Housing: Off-Campus

**Student Qualifications:** Skill sets: Aptitude for listening with intention, ability to establish rapport, and scientific writing skills. Experience/comfort working independently/remotely. Prior qualitative data analysis training will be highly valued.

Education/major: Social Sciences preferred, including but not limited to: Psychology, Sociology, Public Health, Anthropology, and Population Sciences.

Career interests: Students interested in pursuing careers in public health and policy, or higher education in public health, psychology, and/or medicine will benefit significantly from this experience.

This internship will be most relevant to students with specific content interests in addiction science, addiction medicine, substance use disorder treatment, or criminal legal health. This research requires the intern to work with human subjects.

**Project Description:** The summer intern will assist with data collection and analysis in a major NIH-funded study examining the implementation of medications for opioid use disorder (MOUD) for criminal legal-involved populations. There is a critical need to support individuals in community supervision (i.e., parole/probation) to decrease the rate of illicit substance use and recidivism and increase retention in treatment. The overall objective of this research is to improve linkage to the continuum of evidence-based care (e.g., MOUD) for criminal legal-involved individuals in Rhode Island; Philadelphia, PA; and Brunswick County, NC. In the trial phase of the study, individuals under community supervision will be randomly assigned to receive assistance from peer support specialists vs. no peer support. There are several data collection components in this study, including but not limited to: baseline and follow-up interviews with participants on community supervision, and interviews with community-based treatment providers and community supervision staff. This internship will be supported by a

well-established research team with content expertise in addiction science and criminal-legal health, and methodological expertise in qualitative and quantitative data analysis.

## Rhode Island

Investigator: Laura Stroud, PhD  
 Institution: Center for Behavioral and Preventive Medicine – The Miriam Hospital  
 Providence, RI  
 Project Title: Placental Genomics in the Developmental Consequences of Marijuana Use in Pregnancy  
 Research: Behavioral Research  
 Research Area: Pregnancy, Cannabis, Marijuana, Substance Use, Genomics, Intrauterine Environment, Epigenetic Placental Pathways, Fetal Growth, Infant Outcomes  
 Earliest Start Date: June 3, 2024  
 Housing: Off-Campus

**Student Qualifications:** We are seeking an undergraduate intern who

- 1) Is passionate about maternal/infant studies, focusing on marijuana use during pregnancy and its impact on neurobehavioral development
- 2) Is enrolled in psychology, public health, neuroscience, epigenetics, or related fields with strong academics
- 3) Is eager for hands-on data management experience
- 4) Has a basic understanding of data entry and cleaning
- 5) Is motivated to engage in academic and professional development opportunities, including participation in lab development activities
- 6) Is a proactive problem solver and takes initiative.

**Project Description:** The Maternal and Infant Studies Lab at the Center for Behavioral and Preventive Medicine conducts research on novel biobehavioral pathways underlying the intergenerational transmission of pregnant people's stress, substance use, trauma, and resilience. The lab recently received a multi-omics R01 focused on the impact of perinatal marijuana use on multi-omics pathways in the placenta impacting offspring neurodevelopment. The undergraduate intern who joins our research team will

- 1) obtain hands-on research experience related to pregnant individuals' marijuana use and fetal/infant neurobehavior
- 2) obtain mentoring around research and career development
- 3) build data management and academic writing skills

The undergraduate intern will have diverse responsibilities such as



- 1) entering and cleaning data
- 2) data management
- 3) statistical analysis and interpretation
- 4) attending and participating in a lab professional development club
- 5) aiding in literature reviews and academic writing.

Throughout their time with us, the undergraduate intern will receive rigorous training and ongoing supervision to ensure that all research activities adhere to the highest ethical standards, including compliance with HIPAA and IRB guidelines. This commitment to rigorous oversight ensures the integrity and validity of our research outcomes.

## South Carolina

**Investigator:** Rachel Tomko, PhD  
**Institution:** Medical University of South Carolina  
 Charleston, SC  
**Project Title:** Gender and Sex Hormone Influences on Cannabis Use Disorder  
 Remission  
**Research:** Behavioral Research  
**Research Area:** Cannabis, THC, Sex, Gender, Harm Reduction  
**Earliest Start Date:** April 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** College juniors or seniors are encouraged to apply, particularly students interested in pursuing graduate work in clinical psychology or a related field.

**Project Description:** Cannabis use disorder (CUD) is prevalent and associated with significant clinical sequelae. Effective treatment for CUD may be complicated by gender and sex differences in the behavioral, biological, and clinical correlates of CUD. Women demonstrate more severe withdrawal, more rapid progression from first use to CUD, and greater likelihood of comorbid psychiatric disorder, while men tend to initiate use earlier and have higher lifetime prevalence rates of CUD. In other addictive disorders, such as alcohol use disorder, clinical trial endpoints are sex/gender specific. However, to date, no work has focused on whether different clinically relevant endpoints may be needed for men and women with CUD. An expert workgroup recently concluded that reduced cannabis use is a viable alternative endpoint to abstinence in CUD trials, particularly in the context of changing patient preferences and growing cannabis legalization. However, the amount of reduction necessary for remission from CUD is unknown and may differ for men and women. An emerging literature suggests that ovarian hormones play a key role in drug use. Preclinical and clinical research suggests that endogenous progesterone attenuates drug sensitivity and behavior. Recent clinical studies investigating exogenous progesterone as a potential pharmacotherapy have shown that it attenuates the subjective and physiological effects of cocaine and tobacco in drug-dependent individuals.

Presently, little is known regarding the interface of progesterone and CUD, and if fluctuations in progesterone levels may impact ability to reduce cannabis use. This proposal addresses a key gap in CUD treatment research by empirically deriving the threshold of cannabis quantity and frequency of use below which most individuals in CUD treatment can achieve CUD remission. Importantly, the roles of gender and ovarian hormones in CUD outcomes are considered and gender-specific endpoints will be derived. Treatment-seeking adults who meet criteria for CUD (N=224, ages 18+, 50% female) will receive 8 weeks of a psychosocial intervention, including computerized CBT4CBT. CUD symptoms and detailed information on cannabis use will be collected from participants during the 8-week treatment period and during a three-month follow-up (1-, 2-, and 3-month follow-up visits). Participants will complete daily electronic diaries to enhance assessment of self-reported cannabis quantity

and frequency of use, corroborated by weekly assessment of a urinary cannabis metabolite, 11-nor-9-carboxy- $\Delta^9$ -tetrahydrocannabinol. Daily saliva samples will be collected for assessment of progesterone. Analyses will examine whether the threshold for cannabis reduction necessary to achieve remission from CUD differs by gender and the effect of variation in progesterone on successful cannabis reduction. The establishment of gender-specific reduction endpoints will have both real-world clinical treatment implications as well as enable future studies to rigorously test promising candidate treatments for CUD.

# Tennessee

Investigator: Burt Sharp, MD  
 Institution: University of Tennessee Health Science Center  
 Memphis, TN  
 Project Title: Pangenomics of Nicotine Abuse in The Hybrid Rat Diversity Panel  
 Research: Basic Research  
 Research Area: Neurogenetics and Neural Circuitry Mediating Nicotine and Oxycodone Drug Taking Behaviors. Discover The Role of Neuronal Phosphodiesterase 4B (PDE4B) In Motivated Operant Taking of Nicotine  
 Earliest Start Date: May 1, 2024  
 Housing: Off-Campus

**Student Qualifications:** We prefer a student who has taken introductory courses in operant behavioral paradigms and laboratory data analysis including statistics. Knowledge of introductory and preferably intermediate level genetics and molecular biology is essential. Career interests: hands-on scientific research at any level.

Education level: Y3 or Y4 undergraduate

Major: biochemistry, molecular biology, neuropsychology, chemistry with a minor in biology

Laboratory work: with live rats, anesthetized rats, and rat brain tissue including terminal surgery to obtain fresh brains.

**Project Description:** Laboratory and Analytical experiences

Project (1) - Quantify nicotine and oxycodone operant drug taking behaviors in rats from 80+ inbred strains to identify genes associated with these behaviors by quantitative trait loci (QTL) analysis; Trainees will learn animal care, animal surgery, cage management, data acquisition, data analysis, and understand QTL analysis to identify genes associated with specific operant behaviors.

Project (2) - Crispr/Cas9 gene knock out of PDE4B in vivo, using specific gRNA constructs delivered in adeno-associated virus (AAV) to specific brain regions by stereotactic surgery; Trainees will learn principles of gRNA construct design, principles of breeding to obtain recombinant Cas9+/Cre+ offspring, and stereotactic surgical delivery of gRNA constructs to specific brain regions. Trainees will study effects of gRNA-mediated gene knockout on operant drug-taking behaviors, learn acquisition and analysis of brain tissue, and understand the analysis and interpretation of behavioral data.

## Tennessee

Investigator: Brendan Tunstall, PhD  
Institution: University of Tennessee Health Science Center  
Memphis, TN  
Project Title: Opposing Contributions of Oxytocin and Corticotropin-Release  
Factor to Alcohol Dependence  
Research: Basic Research  
Research Area: Neurobiology of Alcohol Addiction  
Earliest Start Date: May 1, 2024  
Housing: Off-Campus

**Student Qualifications:** Lab experience especially working with rodents.

**Project Description:** The undergraduate student will assist in completing in vivo optogenetics experiments aimed at using laser light to activate oxytocin neurons in the brains of rats drinking alcohol to determine the ability of this activation to alter drinking behavior.

# Texas

**Investigator:** Hyuntaek Oh, PhD  
**Institution:** Baylor College of Medicine  
 Houston, TX  
**Project Title:** Functional Connectivity Alterations Among Opioid Users in Treatment  
**Research:** Clinical Research  
**Research Area:** Substance Use Disorder, Opioid Use Disorder, Clinical Trial, Human Neuroimaging, Functional Magnetic Resonance Imaging (fMRI), Non-Invasive Brain Stimulation, Transcranial Magnetic Stimulation (TMS)  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Education: Backgrounds in Bioengineering, Neuroscience, Psychology, or related field

**Experience:** Research experience in:

- 1) a psychiatric hospital or clinic
- 2) MRI-based neuroimaging.

Experience with neuroimaging analysis tools and Matlab is preferred. Experience in TMS or other neuromodulation techniques is a plus, but not required.

A summer research intern will be required to work with physicians and patients. Therefore, communication skill is essential:

- 1) Listen to others: listen to feedback and input carefully; demonstrate attention to others; acknowledge and listen to differing perspectives in a group; adapt listening behaviors to others; respond to non-verbal cues of speaker
- 2) Oral communication: express ideas clearly and concisely in groups and one-to-one conversations; create an environment with open channels of communication; state a single idea or opinion in a clear, concise statement; present new ideas to authority figures or customers
- 3) Written communication: convey information clearly and concisely through both formal and informal documents; adapt writing style to fit the audience; request or state information using computer software; use appropriate grammar, format, and context for audience

**Project Description:** The Menninger Clinic, long known for excellence in its provision of clinical psychiatric services and affiliated with Baylor College of Medicine, seeks to reestablish itself as a scientific leader in the field of psychiatry. Menninger has a visionary translational clinical research program under development, with a growth strategy linked to the new campus and enhanced collaborative partnership with investigators at Texas Medical Center, the largest medical complex in the world, as well as expanded collaborative projects with researchers in

other major medical centers. The overarching goal is to improve the mental health of our society, racial/ethnic minorities, and people living in rural and urban areas.

Our lab focuses on identifying a biomarker for psychiatric disorders, particularly opioid use disorder, using neuroimaging (fMRI), transcranial magnetic stimulation (TMS), statistical tool, and clinical trials. A summer research intern will be required to conduct research in NIH- and foundation-funded projects. On-going projects include: (1) a clinical trial to evaluate brain response to the TMS treatment in opioid users, and (2) analyze a large multi-modal neuroimaging dataset (e.g., fMRI of reward processing, resting state fMRI, and DTI) of psychiatric patients.

## Texas

**Investigator:** Sven Kroener, PhD  
**Institution:** The University of Texas at Dallas  
Dallas, TX  
**Project Title:** Vagus Nerve Stimulation Modulates Synaptic Plasticity in the Rat Prefrontal Cortex During the Extinction of Drug-Seeking  
**Research:** Basic Research  
**Research Area:** Neuroscience, Cocaine, Vagus Nerve Stimulation, Extinction Learning, Immunohistochemistry  
**Earliest Start Date:** May 6, 2024  
**Housing:** On-Campus

**Student Qualifications:** No previous qualifications are required. The main determinant of successful/productive completion of this internship will be the motivation to do preclinical drug-addiction neuroscience and a demonstrable interest in synaptic plasticity and/or the role of the prefrontal cortex in drug-seeking.

**Project Description:** Our experiments will determine how drug seeking and extinction alter synaptic processing in the medial prefrontal cortex, and how vagus nerve stimulation (VNS) strengthens synaptic plasticity to consolidate extinction memory. An overarching hypothesis of this proposal is that VNS is effective because the transient release of neuromodulators preferentially affects “active networks” (i.e., circuits activated during the behavior that is paired with VNS). One way to test this hypothesis is to perform high-resolution morphological analyses of mPFC neurons and to compare changes in morphology and the distribution of synaptic AMPA receptors between cells that were activated by reinstatement (labeled by the activity marker cFos) and those that were not. This project requires cocaine self-administration, modulation of extinction and reinstatement behavior by VNS, and high-resolution confocal analyses of specific cell types labeled by an intersectional viral approach.



# Texas

**Investigator:** Laura O'Dell, PhD  
**Institution:** The University of Texas at El Paso  
El Paso, TX  
**Project Title:** Preventative Biomarkers and Potential Pharmacotherapies for  
Nicotine Use and Diabetes  
**Research:** Basic Research  
**Research Area:** Tobacco, Nicotine, Vulnerable Populations, Adolescents,  
Females and Persons with Diabetes  
**Earliest Start Date:** May 27, 2024  
**Housing:** On-Campus

## **Student Qualifications:**

- US Citizen/ Permanent Resident
- All applicants must be at least 18 years of age on the program start date.
- Minimum GPA of 3.0
- Rising junior or senior graduating December or later. Outstanding rising sophomores will also be considered.
- Students considering the pursuit of advanced degrees and careers in neuroscience research related areas
- Majoring in: Biology, Psychology or Chemistry/Biochemistry. Other science or engineering majors may be considered depending on the student course background and advanced studies/career interest

**Project Description:** The goal of our laboratory is to provide a better understanding of how various brain neurotransmitter systems play a role in driving drug addiction behavior across various clinical populations. As an example, we have seen that increased anxiety and changes in stress-related genes are increased to a greater extent in female versus male subjects. Thus, stress produced by anxiety is believed to be an important factor contributing to enhanced vulnerability to tobacco abuse in young females. This finding coincides with human clinical reports indicating that females relapse to smoking due to intense anxiety produced by nicotine withdrawal. More recent studies have also shown that diabetic states produce an increase in the rewarding effects of nicotine. These data suggest that greater rewarding effects of nicotine may contribute to greater susceptibility to tobacco abuse among diabetic patients.

# Texas

<b>Investigator:</b>	Brian P. Hermann, PhD
<b>Institution:</b>	The University of Texas at San Antonio San Antonio, TX
<b>Project Title:</b>	Advancing Brain Health Research Through Male Germline Editing in Marmosets
<b>Research:</b>	Basic Research
<b>Research Area:</b>	Stem Cells, Male Germline Development, In Vitro, Gene Editing, Non-Human Primates
<b>Earliest Start Date:</b>	May 20, 2024
<b>Housing:</b>	Off-Campus

**Student Qualifications:** Interns who have experience working with fixed tissues, cryosectioning, immunostaining and microscopy will be most successful in the first project. Interns with experience in bioinformatics (coding experience, R, python) will be most successful in the second project.

**Project Description:** The funded BRAIN Initiative Award supporting the summer research (U01DA054179) brings together proximity to one of two NIH-designated Marmoset Breeding Colonies at the Southwest National Primate Research Center (SNPRC) with leading expertise in:

- 1) Brain health and disease in general and the neurogenetics of epilepsy
- 2) non-human primate (nHP) pluripotent stem cells
- 3) male germ cell development, nHP spermatogenesis and transplantation

We have subdivided our approach into three arms represented by our three specific aims, and in this summer research experience, interns will be involved with experiments in Aim 2. The objective of Aim 2 is to optimize derivation and transplantation of male germ cells derived from cjiPSCs (from Aim 1 in the parent grant) into recipient testes as well as compare those in vitro-derived germ cells to those found in normal marmoset testes through development.

Aim 2 - Optimize derivation and transplantation of male cjiPSC-sourced germ cells into recipient testes. Embryo injection has proven to be an inefficient method by which to introduce CRISPR-edited alleles into the marmoset germ line. In this Aim we propose a novel alternative approach in which we will direct differentiation of edited lines of cjiPSCs generated in Aim 1 to form marmoset male germline-like cell types that will then be subjected to four different protocols to define optimal methodology to foster differentiation and maturation of donor-derived, edited marmoset sperm. We will comprehensively monitor normalcy of the male germline-like cell types derived from the edited cjiPSCs based on transcriptomic and epigenomic profiling. The objective is to develop optimized methodology to produce CRISPR-edited, transgenic marmoset sperm that can ultimately be used to generate transgenic marmosets.

In the funded parent project (U01DA054179), we proposed to characterize normal marmoset male germline development in Aim 2 to establish a reference to which our in vitro germline differentiation efforts should aspire. For this purpose, we are determining the normal pattern of marmoset male germ cell development across fetal and postnatal time, the extent of temporal and spatial homogeneity, and link these outcomes with changes to the soma that drive developmental progression. To do this, we are collecting fetuses at Gestational Week (GW) 10, 12, 15, 17 and 19, and neonates at postnatal week (PW) 1, which correspond to the anticipated post-migratory stages of male germ cell development, including primordial germ cell (PGC), M-prospermatogonia, T1-prospermatogonia, and spermatogonial stem cell (SSC) phases. In this summer internship, fetal and neonatal marmoset testes will be analyzed by immunostaining as previously described using markers of testicular somatic cells, PGCs, prospermatogonial subtypes, spermatogonia, SSCs, and progenitor spermatogonia. Quantification of germ cell types, their spatial distribution, and relationship to the soma will be performed using Image J Fiji. To date, our single-cell RNA-seq analyses of developing marmoset germ cells have revealed considerable heterogeneity in the identity of germ cell types (e.g., PGC, M-prospermatogonia, T1-prospermatogonia, etc.) present at any developmental age (e.g., GW15, GW19, PW1). We will map the marmoset testis transcriptomes in 2D space using Slide-Seq2 and relate the developmental state of germ cells to their spatial position and the state of nearby testicular somatic cells. This will enable a higher resolution understanding of the factors driving germline development so they can be adapted in our in vitro germline development experiments.

## Texas

**Investigator:** Louis Brown, PhD  
**Institution:** University of Texas  
Houston, TX  
**Project Title:** Randomized Trial of a Data-Driven Technical Assistance System  
for Drug Prevention Coalitions  
**Research:** Preventive Research  
**Research Area:** Community Coalitions, Technical Assistance, Risk Reduction  
Behavior, Substance-Related Disorders, Prevention, Adolescent  
Behavior, Implementation Support, Sustainability  
**Earliest Start Date:** May 20, 2024  
**Housing:** On-Campus

**Student Qualifications:** Interests in public health, community organizing, human development, or psychology are appropriate. Students are expected to work with data that has already been collected from humans.

**Project Description:** Over 5,000 community anti-drug coalitions operating in the United States serve as a cornerstone of federal drug prevention. These coalitions, however, have demonstrated effectiveness in preventing substance use only when they use technical assistance (TA) and implement evidence-based programs (EBPs). The absence of TA and EBP implementation by coalitions is a key research-to-practice gap. The Coalition Check-Up TA system is designed to fill this gap by supporting community coalition implementation of EBPs. This trial will test the overall effectiveness of the Coalition Check-Up, including how it contributes to EBP implementation and prevention of youth substance use. Findings will clarify how the Coalition Check-Up, a scalable approach to TA due to its low cost, affects coalition capacity to support EBP implementation. Results will build the evidence-base for how to support community coalitions' sustainable implementation of evidence-based prevention programs and policies.

## Texas

**Investigator:** Heather Webber, PhD  
**Institution:** University of Texas Health Science Center at Houston  
Houston, TX  
**Project Title:** Identifying Electrophysiological Targets for Transcranial Magnetic Stimulation in Cocaine Use Disorder  
**Research:** Clinical Research  
**Research Area:** Addiction, Cocaine Use Disorder, Neuroscience, Reward Functioning, Treatment, Transcranial Magnetic Stimulation, Electroencephalogram, Cue Reactivity  
**Earliest Start Date:** June 3, 2024  
**Housing:** On-Campus

**Student Qualifications:** This site would be a good fit for someone who is interested in receiving research experience toward pursuing a career in psychology, psychiatry, neuroscience, or other related fields. It is preferred that the intern have great social/communication skills, as they may have the chance to receive training in working with a challenging human population. For example, one of the duties the intern will perform is phone screens, a procedure for interviewing potential participants to evaluate eligibility for our studies. Other preferred skills include organization skills and attention to detail, which will be helpful for data collection and data entry.

**Project Description:** The goal of this research project is to test if a form of brain stimulation (transcranial magnetic stimulation) can be used to improve reward functioning in individuals with cocaine use disorder. Participants will complete reward-related behavioral tasks and an electroencephalogram to measure their brain activity before and after a brain stimulation session. Each participant will receive brain stimulation to two different brain regions (dorsolateral prefrontal cortex and dorsomedial prefrontal cortex) plus a "sham", or fake, brain stimulation session on separate days. Ultimately, the long-term goal of this work is to develop improved brain stimulation treatments for cocaine use disorder and other substance use disorders.

# Texas

**Investigator:** Kathryn A. Cunningham, PhD  
**Institution:** University of Texas Medical Branch  
 Galveston, TX  
**Project Title:** NOP Receptor Antagonist for OUD Pharmacotherapy  
**Research:** Basic Research  
**Research Area:** Substance Use Disorders, Addiction Research, Addiction  
 Sciences, Pharmacology, Toxicology, Neuroscience  
**Earliest Start Date:** June 3, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Excitement about science, Team Player, Preferred background in Neuroscience, Psychology, Pharmacology, or Behavioral Science, understanding of the importance of preclinical research to advancing our understanding of biology and behavior pertinent to SUDs

**Project Description:** A summer research intern can expect to explore one of our many ongoing projects. Our team has sustained funding by the NIH, foundations & industry to investigate the pharmacology & biology of potential therapeutic targets involved in the development & progression of substance use disorders (SUDs). This includes dopamine receptors, serotonin receptors, neuromedin receptors, and most recently nociceptin opioid receptors (NOP), the ghrelin receptor, as well as orphan receptors (i.e., GPR139, GPR52). For example, we are investigating the role of the “hunger hormone” ghrelin & its receptor, growth hormone secretagogue receptor 1α (GHS1αR) in preclinical models of opioid use disorder. An intern can explore how epigenetic mechanisms in the brain sustain opioid intake, the potential for AMPAkinines or the NOP receptor antagonist BTRX-246040 to suppress opioid intake, or how GPR52 activators control cellular biology & behavior. Other options include studying neuromedin U receptor 2 (NMUR2) signaling as key interface between hypothalamic & mesolimbic systems & evaluate the action of NMUR2 agonists on feeding behavior. The long-term mission is to provide a rich training environment, with a focus on the development of effective therapeutics to normalize brain health. Other projects include exploring mechanisms of prenatal opioid exposure on brain and behavior, determining the effect of chronic alcohol on brain circuit connectivity, and establishing novel neurocircuits that control cocaine taking.

## Virginia

Investigator: James Bjork, PhD  
Institution: Virginia Commonwealth University  
Richmond, VA  
Project Title: 20/21 ABCD-USA Consortium: Research Project Site at VCU  
Research: Clinical Research  
Research Area: Adolescents, Brain, Development, Impulsivity, Risk-Factors, Resilience  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** Prior to the internship, the intern will be required to undergo on-line training in the responsible and ethical conduct of human-subject research prior to the internship period. This will enable him or her to be able to interact with human research volunteers immediately upon joining the lab. It is anticipated that this internship will be most satisfying to persons interested in adolescent brain development and in cognitive and environmental risk factors for addiction.

**Project Description:** The intern would be helping Virginia Commonwealth University's Decision Neuroscience Laboratory; one of 21 data-collection sites of the NIH Adolescent Brain Cognitive Development Study (ABCD) collect data from over 550 adolescents (mostly twin pairs) and their parents. This includes collection of neurobehavioral data from the adolescents, as well as collection of neighborhood and other environmental factor information from the teen and the parent/caregiver that might confer risk for use of drugs and alcohol.

# Virginia

Investigator: M. Imad Damaj, PhD  
 Institution: Virginia Commonwealth University  
 Richmond, VA  
 Project Title: Genetics Basis of Nicotine Withdrawal in A Reduced Complexity  
 Cross-NCE  
 Research: Basic Research  
 Research Area: Nicotine Addiction Research in Animal Models, Behavioral  
 Genetics, Pain and Neuropathy, Role of Nicotinic Receptors in  
 Behaviors, Vaping Models in Mice, Adolescent Exposure to Drugs  
 of Abuse, Impact of Flavors on Nicotine Dependence  
 Earliest Start Date: April 1, 2024  
 Housing: Off-Campus

## Student Qualifications:

- Science background
- Motivation and interest in research
- Experience with animal behavioral testing is a plus
- Experience in a research Lab is a plus

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



## Virginia

Investigator: Peter Hamilton, PhD  
Institution: Virginia Commonwealth University  
Richmond, VA  
Project Title: Cell Type Transcriptional Mechanisms of Polysubstance Choice  
Research: Basic Research  
Research Area: Neuroscience, Drug Addiction, Epigenetics, Transcription,  
Transcription Factors, Plasticity, Synthetic Biology, Viral Mediated  
Gene Transfer, Drug-Related Behaviors, Laboratory Rodents,  
Social Behaviors  
Earliest Start Date: June 3, 2024  
Housing: On-Campus

**Student Qualifications:** The intern should have knowledge of biology and neuroscience, be self-motivated, curious, and work well with others. Experience in a biology-related laboratory is a plus. Potential research projects do likely involve working with laboratory mice, but there are also potential projects that would involve tissue culture of immortal cell lines, if need be.

**Project Description:** The summer research project will be focused on virally delivering synthetic transcription factors, and transcription factor interacting proteins, to drug-associated brain areas of laboratory rodents to study how artificial function of these molecular processes contribute to drug-related behaviors and brain molecular adaptations.

## Virginia

**Investigator:** Wenhui Hu, MD, PhD  
**Institution:** Virginia Commonwealth University  
Richmond, VA  
**Project Title:** HIV, Methamphetamine and Human iPSC-derived Microglia-containing Cerebral Organoids  
**Research:** Basic Research  
**Research Area:** Human Brain Organoids, iPS Cells, HIV, NeuroHIV, Microglia, Neuropathogenesis, Drug Abuse  
**Earliest Start Date:** May 1, 2024  
**Housing:** Off-Campus

**Student Qualifications:** Highly motivated hard-working students with critical thinking and quick learning skills. Basic knowledge in molecular biology, neurobiology and/or biotechnologies.

**Project Description:** Methamphetamine (METH), a potent addictive psychostimulant, is one of the most abused drugs in the United States. METH abuse is highly prevalent in HIV-infected individuals, which presents unique challenges for HIV prevention and treatment. Given the overlap impact of METH use and HIV infection on neuronal damage in the central nervous system (CNS), it becomes urgent to understand the role of the interplays between METH and HIV in the pathogenesis of HIV-associated neurocognitive disorders (HAND). HAND afflicts up to 50% of people living with HIV on the antiretroviral therapy. However, studies of HAND have been hampered by difficulties in collecting live brain cells from autopsy or biopsy of HIV patients. Recent success in generating microglia and cerebral organoids (CO) from human induced pluripotent stem cells (iPSCs) offers a great opportunity to investigate the impact of METH and/or HIV on the CNS. Dr. Hu's lab has established the microglia-containing cerebral organoids (MCO) to investigate HIV infection and its neuropathogenesis. This summer's research project will focus on the establishment of vascularized MCO (vMCO) and further investigation of the neuropathological changes after HIV infection and/or METH treatment. Accomplishment of the project will allow for further research to clarify the mechanism of HIV persistence in the brain, the impact of HIV and/or METH on the different types of brain cells, and the factors underlying the development of neurocognitive deficits associated with HIV infection and drug abuse.

## Washington

**Investigator:** Priscilla Lui, PhD  
**Institution:** University of Washington  
Seattle, WA  
**Project Title:** Effects of Direct and Vicarious Discrimination on Alcohol and Cannabis Cravings: Virtual Reality Experiment  
**Research:** Basic Research  
**Research Area:** Etiology, Prevention, Alcohol, Cannabis, Social Science, Clinical Psychology, Experimental, Basic Behavioral Science, Human Subjects, Observational, Quantitative  
**Earliest Start Date:** June 17, 2024  
**Housing:** On-Campus

**Student Qualifications:** Basic coursework on research methods in psychology and related fields. Interests in substance use, health disparities, and racism are desired. Experience working with African American/Black populations and communities of color encouraged and preferred. Demonstrate excellent organizational, writing, and verbal communication skills, self-motivated, takes initiative, and ability to work independently and collaboratively with other team members. Best fit for interns interested in psychology or related fields and intend to pursue advanced training in these areas and research careers.

**Project Description:** The research examines how direct and vicarious discrimination experiences may lead to alcohol and cannabis use among Black/African American young adults. The research is also designed to identify possible general and culture-centered targets for prevention and treatment efforts to help reduce drug use and cope against racism and discrimination.

## Washington

Investigator: Marco Pravetoni, PhD  
Institution: University of Washington  
Seattle, WA  
Project Title: Vaccines for Fentanyl  
Research: Drug Development Research  
Research Area: Development of Vaccines, Antibodies, and Pharmacotherapies  
for Opioid Use Disorder and Overdose  
Earliest Start Date: June 3, 2024  
Housing: Off-Campus

**Student Qualifications:** The required qualification for interns depends on their field of interest. Generally, we provide a short training course for all juniors newly joined to our research group and give them some basic lessons. Also, there are some seniors who help the students in the event of any trouble shouting. However, to make the best of this program, we recommend attendees have a basic knowledge of chemistry, immunology, and pharmacology. In terms of soft skills, People familiar with teamwork, eager to learn and passionate about science are welcomed.

**Project Description:** Fentanyl and fentanyl analogs are driving the opioid overdose epidemic in the US. The hypothesis is that vaccines will reduce the incidence of overdoses from fentanyl and fentanyl analogs. To this end, this project aims to develop a series of immunogens containing haptens derived from fentanyl or its analogs with the expectation of selecting leads effective in reducing their distribution to the brain, and their behavioral and toxic effects in mice and rats. Having identified the lead vaccine formulation, the lead vaccine will be taken advance to translation, manufacturing, and regulatory approval process. Finally, the clinical efficiency of the developed vaccine will be evaluated through the first clinical trial phase after IND approval by the FDA.

# Washington

Investigator: Mary A. Hatch, PhD  
 Institution: University of Washington  
 Seattle, WA  
 Project Title: Clinical Trials Network: Pacific Northwest Node  
 Research: Clinical Research  
 Research Area: HIV Prevention, PrEP, Multisite Clinical Trials, Methamphetamine,  
 Opioid Use Disorder  
 Earliest Start Date: June 24, 2024  
 Housing: On-Campus

**Student Qualifications:** Preferred qualifications include interest in clinical research related to human behavior, addiction treatment, HIV risk prevention, sex and drug use risk behavior; how large-scale studies can answer research questions; and exploring the different career paths possible with clinical research and addiction treatment. Undergraduates interested in careers in psychology, medicine, social work, and public health will be a strong fit.

**Project Description:** The Pacific Northwest Node (PNW) of the NIDA Drug Abuse Treatment Clinical Trials Network (CTN), housed at the University of Washington Addictions, Drug & Alcohol Institute, welcomes a NIDA Summer Intern to learn about substance abuse treatment clinical research. This 6-week internship will focus on CTN studies active within the PNW node, especially CTN-0082, an implementation survey study to assess Pre-Exposure Prophylaxis and opioid-related service availability for men who have sex with men and people who use opioids in high-HIV incidence Southeastern US cities. Other CTN clinical trials in substance use treatment at the time of the internship may also be of interest to learn about, such as office-based methadone and a collaborative care model for polysubstance use treatment in primary care. The intern will work with the CTN-0082 lead investigative team based at ADAI, and project directors active on other protocols, to learn about leading or participating in a multi-site trial, how large trials work, and what partnerships with community organizations look like. A particular highlight of this internship is exposure to multiple phases of addiction treatment clinical research and clinical service delivery via multidisciplinary perspectives of clinical psychology, emergency medicine, research assistant staff, social work, and community treatment providers. This internship is intended to be flexible so the individual can gain exposure to aspects of clinical research and practice that are of interest to him/her/them. The experience will likely be a hybrid experience with some virtual work (can be done from intern's home) and some in-person (a period spent in Seattle).

## Washington

**Investigator:** Michael Bruchas, PhD  
**Institution:** University of Washington  
Seattle, WA  
**Project Title:** Dissecting Dynorphin-Kappa Opioid Mediated Reinstatement of Nicotine Preference  
**Research:** Basic Research  
**Research Area:** Neuromodulation, Neural Circuits, Optogenetics, Pharmacology, Behavioral, Affect, GPCRs, Neuropeptides, Imaging  
**Earliest Start Date:** June 3, 2024  
**Housing:** On-Campus

**Student Qualifications:** Interns proficient in mouse handling, brain slicing, performing immunohistochemistry, mouse genotyping, basic mouse behavior and computational methods (such as experience in MATLAB and Python) are preferred. However, this is not a requirement.

**Project Description:** All behaviors we perform as animals are motivated. The Bruchas lab seeks to understand the circuit and molecular substrates of motivated behaviors. Specifically, the Bruchas lab aims to uncover the neuromodulatory-GPCR signaling mechanisms that refine limbic and basal ganglia circuit activity to promote motivated behavior using a combination of neuropharmacology, genetic mouse models, in vivo optogenetics and in vivo optical approaches such as photometry, one- and two-photon single cell imaging.

## Wisconsin

**Investigator:** John Mantsch, PhD  
**Institution:** Medical College of Wisconsin  
Milwaukee, WI  
**Project Title:** Mechanisms Underlying the Influence of Stress on Drug-Seeking Behavior  
**Research:** Basic Research  
**Research Area:** Stress, Relapse, Systems Neuroscience, Behavior, Rodent Models  
**Earliest Start Date:** May 29, 2024  
**Housing:** On-Campus

**Student Qualifications:** Students with an interest in careers paths involving the study of neuroscience and substance use or related areas (clinical or nonclinical) are preferred. While prior experience in a research laboratory is not required, interns should have an educational background in biology, psychology, or neuroscience. Interns will be expected to conduct work involving rodents (rats).

**Project Description:** Summer interns will work with a supportive and highly interactive team to apply a range of cutting-edge approaches to define the neurobiological processes through which stress and adversity promote substance misuse. Novel rodent behavioral models that combine stress and drug use will be paired with techniques that enable the analysis of circuit function, brain signaling, and neuronal morphology. In addition to the training experience provided in the laboratory, interns will have the opportunity to participate in a broader educational culture provided through the Medical College of Wisconsin Summer Program for Undergraduate Research.

## Wisconsin

**Investigator:** Kate Walsh, PhD  
**Institution:** University of Wisconsin-Madison  
Madison, WI  
**Project Title:** Testing a Video and Text Messaging Intervention to Reduce PTSD and Opioid Misuse Among Sexual Violence Survivors  
**Research:** Clinical Research  
**Research Area:** Sexual Violence, Early Intervention of PTSD and Opioid Misuse, Video Intervention, Text Messaging Intervention, SMART Trial  
**Earliest Start Date:** May 13, 2024  
**Housing:** On-Campus

**Student Qualifications:** Interns should be organized, reliable, detail-oriented, interested in gender-based violence and substance misuse research, have at least a year of experience conducting human subjects research in a lab or as part of a thesis, human subjects training, and strong communication abilities.

**Project Description:** The overall R61 project develop an integrated video and text messaging intervention to prevent the onset and/or escalation of posttraumatic stress disorder and opioid misuse among recent sexual assault survivors presenting to the emergency department for a sexual assault medical forensic exam. The summer research project goals are to compile data from a Sexual Assault Advisory Board about how to improve the video and text messaging intervention; integrate this feedback into the content, ordering, and look/feel of the text messages; prepare and submit IRB applications for the pilot trial; and assist with the training and protocol development for the emergency department recruitment procedures.



## West Virginia

**Investigator:** Gregory B. Dudley, PhD  
**Institution:** West Virginia University  
Morgantown, WV  
**Project Title:** Chemical Synthesis of Illudalic Acid Analogs for Stimulant Use Disorder  
**Research:** Basic Research  
**Research Area:** Organic Synthesis, Medicinal Chemistry, Substance Use Disorder, Pharmacology, Illudalic Acid  
**Earliest Start Date:** May 15, 2024  
**Housing:** On-Campus

**Student Qualifications:** This internship is best suited for chemistry or biochemistry majors with an interest in graduate school. Interns will develop skills in organic synthesis and medicinal chemistry and gain familiarity with pharmacology and biological assays. No direct work with animals is involved.

**Project Description:** This research project is at the interface of organic chemistry and medicinal chemistry. It will use molecules identified from nature to guide the design and chemical synthesis of biologically active drug-like molecules as potential treatments for stimulant use disorder. Specifically, this project will focus on a natural product known as illudalic acid from the jack o' lantern mushroom, using its structure to design, make, and test new protein tyrosine phosphatase receptor-type D (PTPRD) inhibitors. PTPRD is an important therapeutic target for stimulant use disorder, and illudalic acid and related compounds inhibit PTPRD by a unique mechanism of action that creates opportunities for drug discovery. Applying organic synthetic methods, we will create a diverse library of compounds and have them screened for PTPRD activity, ultimately aiming to link certain structural elements to specific biological effects. We foresee publishing our work and potentially sharing our materials to drive drug discovery.