NIDA Genetics and Epigenetics Cross-Cutting Research Team Meeting

May 16–17, 2023

AGENDA

DAY 1: Tuesday, May 16, 2023	
9:00 a.m.	Welcome
9:05 a.m.	Opening Remarks by Nora D. Volkow, M.D., Director, NIDA
9:15 a.m.	Andre Toussaint, Ph.D. Title: Understanding Substance Abuse from Scientific and Human Perspectives
9:45–11:10 a.m.	**Single Cell Transcriptional and Chromatin Profiling of Brain Reward Structures Identifies New Candidate Targets in Substance Use Disorders, Chairs: Eric Nestler, M.D., Ph.D., and Jeremy Day, Ph.D.**
9:45 a.m.	Kristen Maynard, Ph.D. Title: Integrated Single Cell and Spatial Transcriptomic Approaches for Defining the Molecular Anatomy of Reward Circuitry in the Human Brain
10:00 a.m.	Marine Salery, Ph.D. Title: Capturing and Profiling Cocaine-Recruited Arc Neuronal Ensembles Encoding Drug-Context Associations in the Nucleus Accumbens
10:15 a.m.	Jennifer Tuscher, Ph.D. Title: Multiomic Profiling of the Rat Nucleus Accumbens Reveals Cell-Type Specific Chromatin Remodeling and Transcriptional Alterations after Cocaine Experience
10:30 a.m.	Benjamin Reiner, Ph.D. Title: Single Nuclei Transcriptomic Analysis of Rat Nucleus Accumbens Reveals Cell Type-Specific Patterns of Gene Expression Associated with Volitional Morphine
10:45 a.m.	Discussion
11:00 a.m.	Anita Bandrowski, Ph.D. Short Presentation on Tool That May Be Useful for Complying with Data Management Sharing Policy
11:10 a.m.–12:40 p.m.	**Poster Session A – Presenter Abstracts and Poster Listings Available here**

12:40–2:00 p.m.	**Lunch — Mentoring Lunch and Discussion of Data Management Sharing Policy at Tables**
2:00–3:00 p.m.	**Artificial Intelligence (AI) Application in Genetics and Epigenomics, Chairs: Carl Lin, Ph.D., and Sara Mostafavi, Ph.D.**
2:00 p.m.	Carl Lin, Ph.D. Title: History and Application of Artificial Intelligence: Its Turn for Genomics
2:00 p.m.	Sara Mostafavi, Ph.D. Title: Sequence-Based Deep Learning Models for Predicting Molecular Phenotypes
2:15 p.m.	Hongyang Li, Ph.D. Title: Asymmetric Predictive Relationships across Histone Modifications
2:30 p.m.	Andreas Pfenning, Ph.D. Title: Fine-Mapping Candidate Neuropsychiatric Regulatory Variants Using Cell Type-Aware Comparative Genomics
2:45 p.m.	Discussion
3:00–4:30 p.m.	**Poster Session B – Presenter Abstracts and Poster Listings Available here**
4:30–5:20 p.m.	**Short Presentations**
4:30 p.m.	Alex Hatoum, Ph.D. Title: Multivariate Genome-Wide Association Meta-analysis of 1 Million Subjects Identifies Loci Underlying Multiple Substance Use Disorders
4:40 p.m.	Jeffrey Hatfield Title: Cocaine Preference in the *Drosophila Melanogaster* Genetic Reference Panel
4:50 p.m.	Chelsie Benca-Bachman, Ph.D. Title: Additive Genetic and Interactive Effects on Alcohol Problems and Traumatic Experiences among African Americans
4:55 p.m.	Xiufang Guo, Ph.D. Title: Development of an iPSC-preBötC Neuron Opiate Overdose and Recovery Multi-organ Platform
5:00 p.m.	Jennifer Kelschenbach, Ph.D. Title: Morphine Dependence Accelerates HIV-Associated Neurocognitive Impairment in EcoHIV Infected Mice
5:05 p.m.	Salma Majid, Ph.D. Title: Recurrent and Non-recurrent Copy Number Variants in American Indian Tribes with Substance Use Disorders
5:10 p.m.	Freddyson Martinez-Rivera, Ph.D. Title: Cellular and Transcriptional Contributions of the Nucleus Accumbens in Transferring Extinction-Based Memories

5:15 p.m.	Evaristus Nwulia, M.D. Title: Linking Cannabis Use Disorder, Long-Noncoding RNA and Olfactory Structure and Function
5:20 p.m.	**Adjourn for Day 1** Dinner on your own.

DAY 2: Wednesday, May 17, 2023

8:50 a.m.	Welcome Back
9:00–10:15 a.m.	**Noncanonical Regulation of Gene Expression by Drugs with Addictive Properties** **Chairs: Elizabeth Heller, Ph.D., and Zhuzhu Zhang, Ph.D.**
9:00 a.m.	Elizabeth Heller, Ph.D. Title: Cocaine Regulation of Alternative Splicing via Changes in Histone Posttranslational Modifications
9:15 a.m.	Zijun Wang, Ph.D. Title: DNA Damage and Repair Processes Are Involved in Opioid Addiction
9:30 a.m.	Francesca Telese, Ph.D. Title: Epigenomic Remodeling at Single Cell Resolution in Cocaine Self-Administration in Mice
9:45 a.m.	BaDoi Phan, M.D., Ph.D. Title: Whole-Animal Massively Parallel Reporter Assay Dissects the Region-Specific Transcriptional Impact of Human Addiction Genetic Variants
10:00 a.m.	Discussion
10:15–11:45 a.m.	**Poster Session C – Presenter Abstracts and Poster Listings Available here**
11:45–1:15 p.m.	**Lunch — Discussion with Program about Resources and Scientific Directions**
1:15–2:30 p.m.	**The Role of Behavioral Undercontrol in Mediating Genetic Risk for Substance Use Disorders** **Chairs: Abraham Palmer, Ph.D., and Danielle Dick, Ph.D.**
1:15 p.m.	Holly Poore, Ph.D. Title: Characterizing the Genetic Overlap between Externalizing Phenotypes and Substance Use Disorders
1:30 p.m.	Sandra Sanchez-Roige, Ph.D. Title: *CADM2* Is Implicated in Impulsive Personality and Numerous Other Traits by Genome- and Phenome-Wide Association Studies in Humans and Mice
1:45 p.m.	Huda Akil, Ph.D. Title: Selectively Breeding for Temperament and Vulnerability to Addiction: A Genetic, Genomic and Neural Characterization of Behavioral Undercontrol and Overcontrol

2:00 p.m.	Michael Sheldon, Ph.D. Title: Biobanking as a Foundational Component of NIH Research: The NIDA Center for Genetic Studies Provides a Critical Resource for Research into the Genetics and Epigenetics of Substance Abuse
2:15 p.m.	Discussion
2:30–4:00 p.m.	**Poster Session D – Presenter Abstracts and Poster Listings Available here**
4:00–4:50 p.m.	**Short Presentations**
4:00 p.m.	Amrit Koirala, Ph.D. Title: Deconvolution of microRNA/mRNA Networks in Brain Regions Impacted by Cocaine Use Disorder to Develop a Mechanistic Biosignature for Pharmacotherapy Response
4:10 p.m.	Vivek Philip, Ph.D. Title: Enumeration and Visualization of Differential Gene Co-expression Response to Cocaine
4:20 p.m.	Janitza Montalvo-Ortiz, Ph.D. Title: Deciphering the Role of DNA Hydroxymethylation in Substance Use Disorders
4:25 p.m.	Madhurbain Singh Title: Examining Bidirectional Causal Effects between Smoking and DNA Methylation Using Epigenetic Mendelian Randomization Analyses
4:30 p.m.	Alyssa Wilson, Ph.D. Title: Identifying Cell-Type-Specific Transcriptional Changes in Midbrain in the Context of Substance Use Disorder and Long-Term HIV Infection: A Cohort Study at the Manhattan HIV Brain Bank
4:35 p.m.	Francesca Telese, Ph.D. Title: Analysis of Single Nuclei RNA-seq from the Nucleus Accumbens of Heterozygous Reeler Mice Exposed to THC during Adolescence Suggests a Link between THC Exposure, Reelin Signaling, and Vulnerability to Human Psychiatric Disorders
4:40 p.m.	Jared Bagley, Ph.D. Title: Neuron Navigator 1 Regulates the Self-Administration of Cocaine
4:45 p.m.	Laura Saba, Ph.D. Title: Multi-omic Single Nuclei Data Provide Insight into the Cellular Origin of Whole Brain Coexpression Patterns Related to *Oprm1*
4:50 p.m.	**Adjourn**