Short Course on the Genetics of Addiction
April 19 - May 7, 2020

This virtual event will meet via Zoom from 12:00 to 2:00 pm (EDT) each week on Monday, Wednesday, and Friday. Sessions will be a combination of brief lectures and open discussion with subject experts.

Monday, April 19th – Session One

How and why do we study the genetics of addiction?		
• Overview of addiction genetics in mouse and human • Addiction genetics in humans • Addiction genetics in the laboratory mouse	12:00 pm	Elissa Chesler, Ph.D.
	12:30 pm	Howard Edenberg, Ph.D.
	1:00 pm	Panel Discussion Moderated by Wade Berretini, M.D., Ph.D.

Wednesday, April 21st – Session Two

How do we define and characterize addiction in humans and model organisms?		
• Human phenotypes • Mouse behavioral phenotyping • Similarities/differences	12:00 pm	*Defining Addiction Phenotypes: Humans* Pamela Madden, Ph.D.
	12:30 pm	*Rodent Behavioral Models of Addiction* Lisa Tarantino, Ph.D.
	1:00 pm	Panel Discussion Moderated by David Jentsch, Ph.D.

Friday, April 23rd – Session Three

How do we study human genetics of addiction and what are the challenges and unanswered questions?		
• Human genetics of addiction • Heritability, twin studies, phenotype and development • GWAS fundamentals	12:00 pm	*How Do We Study Human Genetics of Addiction: Heritability, Twin Studies, Phenotype and Development?* Danielle Dick, Ph.D.
	1:00 pm	*GWAS Fundamentals* Sandra Sanchez-Roige, Ph.D.

Monday, April 26th – Session Four

What are the methods and populations for genetic studies in model organisms?		
• Mouse genetic analysis • Mouse populations for genetic analysis • Rat populations and resources	12:00 pm	*How to Use Mouse Populations in Addiction Research* Vivek Kumar, Ph.D.
	12:45 pm	*Rat populations for Genetic Studies in Model Organisms* Leah Solberg Woods, Ph.D.
	1:30 pm	Q&A Moderated by Rob Williams, Ph.D.

Wednesday, April 28th – Session Five

What makes a "disease model" and what are the challenges to modeling human variants in laboratory mice?		
• Making "humanized mice" • Genetic background and phenotype • Modeling disease argument; cell culture, behavioral models and validity	12:00 pm	*Making and Using Mouse Models* Julie Blendy, Ph.D.
	12:30 pm	*Selecting Subjects from GWAS for iPSC Addiction Mechanism Studies* Ronald Hart, Ph.D.
	1:00 pm	*Precision Modeling in Mice Using CRISPR/Cas9 Genome Engineering* Kevin Peterson, Ph.D.

Friday, April 30th – Session Six

How do we study gene expression genetics and what can it tell us about addiction biology?		
• Gene expression and gene regulation • Gene expression analysis • Epigenetics in addiction	12:00 pm	*How Can Transcriptomics Inform Behavior Across the Spectrum of Addiction?* Deena Walker, Ph.D.
	12:30 pm	*A Brief Introduction to Gene Expression Genetics* Michael Saul, Ph.D.
	1:00 pm	Panel Discussion Moderator TBD

Monday, May 3rd – Session Seven

Where do we access and analyze model organism addiction data?		
• Software overviews, purpose, access	12:00 pm	*Finding and Working with Substance Use Disorder Traits in Mice Using the Mouse Phenome Database,* Vivek Philip, Ph.D.
	12:10 pm	*Genetic Data and Tools for Substance Abuse Research in Rats: GeneNetwork, PhenoGen, RGD, and RatsPub*, Laura Saba, Ph.D.
	12:20 pm	*GeneWeaver: A Database and Suite of Tools for Integrative Functional Genomics* Jason Bubier, Ph.D.
	12:30 pm	*Smart Quadratic Data and Its Use to Study Substance Use Disorders* Rob Williams, Ph.D.
	12:40 pm	Q&A and Open Discussion All panelists

Wednesday, May 5th – Session Eight

Where do we access and analyze human addiction genetics and genomics data?		
• Fuma, LD Hub	12:00 pm	Alexander Hatoum, Ph.D.
	12:30 pm	*TBD* Ray Walters, Ph.D.
	1:00 pm	Q&A and Open Discussion All panelists

Friday, May 7th – Session Nine

What are the rationale, methods and approaches for cross species integration?		
Round Table & Open Discussion	12:00 pm	Elissa Chesler, Ph.D. Jason Bubier, Ph.D. Howard Edenberg, Ph.D. Sandra Sanchez-Roige, Ph.D.
Closing Comments	1:45 pm	Elissa Chesler, Ph.D. & Howard Edenberg, Ph.D.