Neuroscience Seminar Series schedule

All seminars are currently scheduled from 4-5 pm mountain time. Currently, all the speakers are schedule to present in-person, but this may change; I will keep you posted.

Spring 2023

January 31, 2023 – Dr. Ana 'AC' Bobadilla (in person)
Assistant Professor, School of Pharmacology, University of Wyoming

Title: **Reward-specific ensembles in the nucleus accumbens core.**

Abstract: Dr. Bobadilla investigates the neurobiological mechanisms of relapse to drugs. Specifically, she characterizes the specific ensembles of neurons that drive reward-seeking behavior. By establishing whether addictive drugs hijack the circuitry/ensembles coding for biological rewards, these findings aim to advance fundamental understanding of goal-directed behaviors and the disorders altering them.

February 14, 2023 – Dr. Malavika Murugan (in person)
Assistant Professor, Department of Biology, Emory University

Title: **Approach or avoid: Deciding what to do with a conspecific.**

Abstract: One of the most critical social decisions is whether to approach or avoid a conspecific based on the quality of previous interactions. Yet, how we recognize who we are interacting with and how that information is transformed to guide subsequent behavior remains relatively unknown. In this study, we probe how social familiarity/ novelty information encoded in the ventral hippocampus (vHPC) is transformed to modulate competing behavioral states such as social approach versus avoidance /aggression. Through optogenetic and chemogenetic experiments we have mapped vHPC projections to the lateral septum (LS) as a potential site of this transformation. Combining optogenetic, chemogenetic, viral intersectional strategies and rabies tracing methods, we have identified a hippocampal-septal-ventral tegmental circuit that allows animals to discriminate novel from familiar animals and engage in social novelty-related approach behaviors. We are currently using calcium imaging to understand how this transformation is reflected in the endogenous activity patterns of vHPC and LS neurons.

February 28, 2023 – Dr. Sara Aton (in person)

Associate Professor, Department of Molecular, Cellular and Developmental Biology, University of Michigan

Title: **Gating of hippocampal network activity during sleep deprivation.**

Abstract: Sleep is essential for cognitive functions, but the underlying neurobiological mechanisms are poorly understood. One aspect of cognition that is particularly susceptible to disruption by sleep loss is hippocampally-mediated storage of spatial and episodic memories. I will discuss recent studies from our lab aimed at clarifying how sleep loss affects hippocampal functions, and which features of sleep might be particularly useful for encoding and storing new information in hippocampal circuits. Our lab's approach to these questions combines cell type- and circuit-specific profiling of transcription and translation in the hippocampus, electrophysiological recordings of hippocampal network activity, and behavioral, optogenetic, and chemogenetic manipulations during post-learning sleep. Here I will focus on changes to hippocampal interneurons' activity with sleep deprivation, and how this affects the reactivation of memory-encoding neurons during post-learning sleep.

March 14, 2023 – TBA

Title:

Abstract:

April 11, 2023 – Dr. Lin Tian (in person)

Professor and Vice Chair, Department of Biochemistry and Molecular Medicine, Center for Neuroscience, University of California at Davis, California.

Title: **Creating tools for imaging dynamics of neurochemicals *in vivo*.**

Abstract: I will discuss molecular probes that the Tian Lab has recently developed to enable precise measurement of spatiotemporal dynamics of neuromodulator release. In combination with behavioral and circuit manipulations, these tools can reveal the brain mechanisms underlying the control of various behaviors in health and disease. Our biosensors, many of which are freely available, can also serve as drug discovery platforms for the identification of novel therapeutic targets.

April 25, 2023 – Dr. Michael Bruchas (in person)

Professor, Center for the Neurobiology of Addiction, Pain and Emotion, Department of Anesthesiology and Pain Medicine, Department of Pharmacology, University of Washington, Washington.

Title: **Decoding Heterogeneity of the Locus Coeruleus Noradrenergic System in Arousal and Stress.**

Abstract: All animals must tune their psychological and physiological arousal levels to maintain homeostasis and respond to salient stimuli in the environment. In vertebrates, this is accomplished by tuning the activity of the locus coeruleus (LC), a structure in the brainstem that releases most of the norepinephrine across the neuraxis. Changes in LC firing patterns and the differential activity of LC ensembles are crucial for coordinating states of arousal across distant brain regions; however, how these features of LC activity are established remain largely unknown. Our work identifies and profiles a diverse population of GABAergic neurons that surrounds the LC and responds to salient stimuli to modulate arousal-related behaviors. Many human neuropsychiatric diseases are characterized by dysregulation in the LC and cognitive arousal, including drug addiction, anxiety, and depression. These findings greatly improve our understanding of the regulation of arousal and related behavior in the brain and offer new potential therapeutic targets for these psychiatric diseases.