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DeAnna Adkins, Ph.D.:
Assistant Professor, Department of Neuroscience
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Research Interests
Dr. Adkins' research program is focused on further understanding the relationship between experience-dependent brain plasticity and functional recovery after stroke and traumatic brain injury. The lab investigates how learning-induced neural plasticity can be capitalized upon and used in conjunction with novel pharmacological, behavioral and technological treatments to drive better motor and cognitive recovery after brain injury. One of the primary goals of this research program is to translate basic research findings into more optimized treatments for human survivors of brain damage.

Brett Froeliger, Ph.D.
Assistant Professor, Department of Neuroscience
MUSC
Research Interests
The purpose of the Translational Research of Addiction and Integrative Neurosciences (TRAIN) Lab is to investigate the neural basis of drug addiction (e.g. smoking, psychostimulant abuse) and psychiatric illness (e.g. Depression, PTSD) using cognitive and affective neuroscience theory and methods. Our approach is to provide a bridge between preclinical with human clinical trials research in order to better understand the etiology of dyregulated behavior and the effectiveness of new treatment that may ultimately, be used in the clinic.

Peter Kalivas, Ph.D.:
Professor and Chair, Department of Neuroscience
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Research Interests
The Kalivas lab studies neuroplasticity underlying the development of addiction to drugs of abuse, as well as the learning and memory deficits associated with impoverished rearing environments. Research is at the level of protein biochemistry, neural circuitry and behavioral modeling. The current focus for both addiction and isolation rearing is in adaptations in excitatory neurotransmission. In collaboration with electrophysiologists in the department (Drs Lavin, Seamans, Woodward) we are elucidating the fundamental role of extracellular glutamate homeostatis in regulating neurotransmission and neuroplasticity. This has led to preclinical and clinical evaluations of specific proteins as targets in treating addiction, including metabotropic glutamate receptors and the cystine-glutamate exchanger.

Jakie McGinty Ph.D.:
Professor of Neuroscience and Director of the Neuroscience Institute
MUSC
Research Interests
Dr. McGinty's preclinical research aims to understand the underlying mechanisms of, and produce treatments for, debilitating substance use disorders. IN NIH NIDA-funded projects, Dr. McGinty's lab has demonstrated that ERK dephosphorylation (or "shutoff") occurs in the prefrontal cortex (PFC) within 2 hours after repeated cocaine self-administration (SA) in rats. Her lab also found that a single infusion of brain-derived neurotrophic factor (BDNF) into the PFC normalizes glutamate

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transmission in the nucleus accumbens and suppresses cocaine seeking. Currently Dr. McGinty's lab seeks to characterize the molecular mechanisms underlying the cocaine SA-induced ERK shutoff and BDNF's suppressive effects on cocaine-seeking to develop clinically relevant targets for medication development. The lab is also involved in a collaboration funded by the Dept of the Army that aims to investigate oxytocin's effects on methamphetamine-seeking in rats that have experienced repeated predator odor exposure as a pre-clinical model of Post-Traumatic Stress Disorder.

Arthur Riegel, Ph.D.:
Assistant Professor, Department of Neuroscience
MUSC
Research Interests
The Riegel Lab investigates neuroplasticity in brain circuits that serve important roles in behavior, as well as cognition, motor activity, motivation, attention, learning and reward. Our work focuses on dopamine neurons in the ventral tegmental area and glutamate neurons in the prefrontal cortex that process the interpretation of unexpected rewards and encode a teaching signal. The laboratory uses a variety of techniques including behavior, patch clamp electrophysiology, imaging, chemogenetics and optogenetics to understand the mechanisms that regulate the sensitivity to neurotransmitters. Studies examine intracellular signaling, ion channel effectors (GIRK, sK, Kv7 (KCNQ)), and modulatory neuropeptides (endogenous opioids, endocannabinoids, corticotrophin releasing factor (CRF)).

Andy Shih, Ph.D.:
Assistant Professor, Department of Neuroscience
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Research Interests
Our lab is interested in understanding how blood is supplied to the brain during health and disease. We use advanced optical techniques (in vivo two-photon imaging) and genetic targeting strategies to visualize and manipulate blood flow at the level of the smallest arterioles, venules and capillaries of the rodent brain. The goal is to determine how anomalies in blood flow at the microvascular level affect brain function and repair after injury. For more information, please visit our website (theshihlab.com).