FIU | Engineering & Computing
Department of Biomedical Engineering

Wallace H. Coulter Foundation
Biomedical Engineering Seminar Series

TERESA A. MURRAY, PHD, is the Director of the Integrated Neuroscience and Imaging Laboratory at Louisiana Tech University in Ruston, Louisiana and the Rhodes Eminent Scholar Chair in Engineering. Her lab develops tools for neuroscience research and conducts longitudinal studies on traumatic brain injury, stroke, epilepsy, and other neurological disorders. Dr. Murray received a BS in Bioengineering and a PhD in Bioengineering from Arizona State University and was an NSF Graduate Research Fellow and NSF IGERT Fellow from 2003 - 2008. Her graduate work focused on engineering neural receptor proteins to study subunit coassembly, trafficking and function which led to the characterization of a new type of nicotinic acetylcholine receptor in the mammalian brain. During her postdoctoral fellowship at Yale University, she designed implantable microlens systems for high resolution, acute imaging in deep brain regions of mice. At Louisiana Tech, her lab developed permanently implantable micro-lens systems for longitudinal studies of injury and disease and the effects of therapeutic interventions. Her lab has also developed imaging support systems for in vivo and in vitro imaging over time and a novel, open source program for scoring ethological behavior in rodents. She has also co-developed novel geometries for biosensors to record neurotransmitter dynamics in models ranging from cultured cells to rats with temporal lobe epilepsy. Her research is funded by the National Institutes of Health, the National Science Foundation, and private foundations.

9/22/23

Dr. Teresa Murray

Rhodes Eminent Scholar Chair and
Professor of Biomedical Engineering

Louisiana Tech University

Friday, September 22nd | 9:00 AM | EC 2300

New Neurochemical Sensors and Micro-Lenses for Biomedical Research

ABSTRACT: Traumatic brain injury and stroke produce chronic inflammation that results in secondary brain damage which can lead to further neurological impairments. The inability of most drugs to cross the blood brain barrier (BBB) has led to a dearth of effective treatments to mitigate secondary injury. More effective medications are also needed for the third of epilepsy patients whose seizures are not controlled using currently available drugs. These situations have prompted Dr. Teresa Murray to create longitudinal methods to observe the effects of injury and of promising therapies using rodent models of these disorders. Dr. Murray will show how her lab developed high resolution micro-optics, multiphoton microscopy and 3D printing to create an in vivo imaging system to monitor the same brain cells over a few months. This powerful method spans a temporal range from milliseconds to months and a spatial range from dendritic spines to local cellular networks. She will show how this system was employed to capture progressive secondary damage and recovery after drug administration. She will also reveal the results of studies using nanoscale drug carriers that cross the BBB and, she will show results from a novel neurochemical biosensor system that has enabled long-term recording of excitatory and inhibitory signaling in seizures and sleep.

Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

Friday, September 22nd, 2023 | 9:00AM - 10:00AM | EC 2300
https://bme.fiu.edu/seminars