



ICSE/GC-CAMP Seminar

Professor Zhiyong Liu, Assistant Professor, Department of Cell, Developmental and Integrative Biology, University of Alabama at Birmingham (UAB)

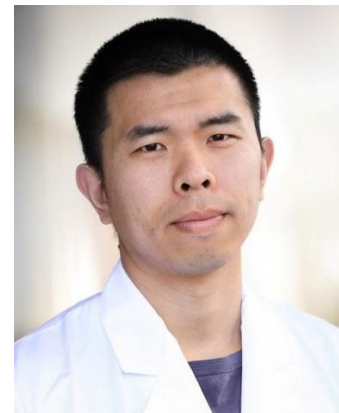
Date and Time: 1:15 pm, Friday 4/25

Location: Shelby Hall, Room 2119, (Zoom link: <https://southalabama.zoom.us/j/96122375189>)

Seminar Topic: Anionic nanoplastic contaminants promote Parkinson's disease-associated α -synuclein aggregation

Abstract: Recent studies have identified increasing levels of nanoplastic pollution in the environment. Here, we find that anionic nanoplastic contaminants potently precipitate the formation and propagation of α -synuclein protein fibrils through a high-affinity interaction with the amphipathic and non-amyloid component (NAC) domains in α -synuclein. Nanoplastics can internalize in neurons through clathrin-dependent endocytosis, causing a mild lysosomal impairment that slows the degradation of aggregated α -synuclein. In mice, nanoplastics combine with α -synuclein fibrils to exacerbate the spread of α -synuclein pathology across interconnected vulnerable brain regions, including the strong induction of α -synuclein inclusions in dopaminergic neurons in the substantia nigra. These results highlight a potential link for further exploration between nanoplastic pollution and α -synuclein aggregation associated with Parkinson's disease and related dementias.

Bio: Professor Zhiyong Liu is a tenure-track Assistant Professor in the Department of Cell, Developmental, and Integrative Biology at the University of Alabama at Birmingham (UAB). He earned B.S. in biotechnology from Sun Yat-sen University in China, Ph.D. in biochemistry from UAB, and completed postdoctoral training in cell biology at Duke University. Professor Liu's laboratory investigates how dysregulation of subcellular trafficking pathways contributes to the pathogenesis of neurodegenerative diseases, including Alzheimer's disease (AD) and Parkinson's disease (PD). His research is currently supported by a K99/R00 Pathway to Independence Award from the National Institute on Aging, focusing on the role of small Rab GTPases in regulating subcellular trafficking pathways relevant to neurodegenerative diseases.



About: ICSE and GC-CAMP

The [Interdisciplinary Center for Sustainable Engineering \(ICSE\)](#) and the [Gulf Coast Center for Addressing Microplastic Pollution \(GC-CAMP\)](#) are two research-driven collaborative initiatives at the University of South Alabama (USA). Both centers are dedicated to promoting education, research, and community engagement for a better and more sustainable Gulf of America.

- **ICSE** welcomes diverse opportunities for collaboration, fosters partnerships for funding initiatives, and provides services to communities, industries, and agencies at various levels. We take pride in the expertise across the Gulf Coast and are committed to problem-solving, innovation, and cost-effective solutions for all. The center offers a diverse array of academic courses, workshops, and training programs that equip students, professionals, and community leaders with the knowledge and skills needed to navigate the complex landscape of sustainability and resilience.



Interdisciplinary Center for Sustainable Engineering (ICSE)

- **GC-CAMP** is a pioneering center leading advancements in identifying and managing plastic marine debris along the Gulf Coast. Our primary goal is to drive a paradigm shift in research by developing innovative techniques and tools to effectively mitigate and prevent plastic pollution. With a shared commitment to excellence, GC-CAMP aims to lead efforts in tackling microplastic challenges, making a lasting positive impact on the Gulf Coast and beyond.



If you are interested in being affiliated with one or both centers, please reach out to Dr. Shenghua Wu, Email: shenghuawu@southalabama.edu