

FFIRE brief description

Research conducted at the Stice Laboratory at the University of Georgia (UGA) has illuminated crucial avenues for advancing our understanding of extracellular vesicles and their potential applications in addressing neurodegenerative diseases and stroke. However, to continue pushing the boundaries of scientific knowledge and translate these discoveries into practical therapies, ongoing research funding is vital. Several include the following:

1. **Mechanistic Insights:** While we have made significant progress has been made in understanding the roles of extracellular vesicles in neurodegenerative diseases and stroke, there remains a need for further investigations into the intricate mechanisms governing their homing and interactions with neurons, other cells, and the surrounding microenvironment. We work with Regenerative Bioscience Center faculty on mechanistic studies to unravel the complex signaling pathways and molecular interactions underlying the effects of extracellular vesicles.
2. **Optimization of Therapeutic Cargo for Neurodegenerative Diseases:** We as developing approaches aimed at effectively delivering therapeutics to the brain. This strategy exploits the inherent properties of extracellular vesicles to ferry drugs that would otherwise be impeded by the formidable blood-brain barrier. As most contemporary drugs struggle to penetrate this barrier. Enhancing the cargo carried by extracellular vesicles, such as optimizing the content of specific neuro protective proteins such as AKT (Dr Lohitash Karumbaiah), a peptide developed in house with Eileen Kennedy (MJFF funded) and nucleic acids (Dr Yao Yao) are focused research efforts
3. **Multi-Disciplinary Collaboration in manufacturing:** Building on our current collaborations with Marcus Center for Cell Manufacturing, Center for Cell manufacturing Technologies and industry partner Aruna Bio. Take or Collaborative efforts involving clinicians, biologists, bioengineers, and other experts are pivotal for advancing this field to the next level. Funding could facilitate interdisciplinary collaborations, promoting the exchange of ideas and expertise to accelerate progress and training. Research funding could be allocated to further optimize the manufacturing processes for extracellular vesicles, ensuring scalability, consistency, and quality control. Collaboration with industry partners and experts in manufacturing will be essential to bring these therapies to a broader patient population.
4. **Public Awareness and Education:** Allocating of time towards public awareness campaigns and educational initiatives can help disseminate knowledge about the potential of extracellular vesicles in neurodegenerative diseases and stroke. This could encourage public support, engagement, and potential new philanthropic contributions. All projects have this component.

In summary, our ongoing research is critical to drive the next steps in advancing extracellular vesicle-based therapies for neurodegenerative diseases and stroke.