NATHAN SHOCK CENTERS OF EXCELLENCE IN THE BASIC BIOLOGY OF AGING

PILOT AWARDEE SPOTLIGHT

David Hughes, PhD

Research Assistant Professor
Oklahoma Medical Research Foundation

2023 Oklahoma NSC Pilot Awardee

Identifying a novel role for UBR5 in protein turnover and aging skeletal muscle

---

How did you become interested in aging?
My focus and attention to the field of aging and specifically age-related muscle loss has developed over time through my postdoctoral training and interactions with leaders in the field of skeletal muscle biology and aging. I have worked on projects investigating the impact of aging and disuse atrophy on cytoskeleton proteins and how these proteins might influence skeletal muscle recovery following inactivity. My academic training and interactions have not only led to published research in aging-specific journals but also a continued passion for aging research and making novel discoveries in skeletal muscle physiology with an emphasis on aging.

Briefly describe your project in non-scientific terms. What questions are you trying to answer?
The focus of my project has been to expand our understanding of cellular systems which are required to maintain a healthy pool of proteins within skeletal muscle and how the process of aging places stress on these systems, leading to decreases in skeletal muscle health. Ultimately, we are trying to identify proteins and signaling pathways that are perturbed during the process of aging and contribute to the decline of skeletal muscle function.

What previous research or experience informed the development of this proposal?
Our previous studies have focused on targeting key proteins involved in protein quality control and how they influence skeletal muscle health and function in adult tissue.

What's exciting about your project's potential impact?
Our proposed research and experimental interventions have the potential to generate new avenues for understanding protein quality control in aging skeletal muscle and how these systems are altered prior to the development of age-related muscle loss and function.

If your project is successful, what is the next step?
Upon completion of the project, the data generated and derived from the tissues collected will provide new avenues for discovery with a potential focus on sexual dimorphism in aging skeletal muscle. Further, our understanding of UBR5 as an E3 ubiquitin ligase in aged muscle will be deepened and potential targets influenced by the action of UBR5 will be studied with the aim of developing strategies to improve skeletal muscle health and function with age.

NATHAN SHOCK CENTERS OF EXCELLENCE IN THE BASIC BIOLOGY OF AGING

PILOT AWARDEE SPOTLIGHT

David Hughes, PhD

Research Assistant Professor
Oklahoma Medical Research Foundation

2023 Oklahoma NSC Pilot Awardee

Identifying a novel role for UBR5 in protein turnover and aging skeletal muscle

---

How has support from and collaboration with the Nathan Shock Centers helped further this project and/or your research overall?

The research project has hugely benefitted from the support and access of the Multiplexing Protein Analysis Core within the Oklahoma Nathan Shock Center through providing state of the art techniques to understand protein turnover. Access to world leading expertise has allowed the project to gain insight into how UBR5 impacts aging skeletal muscle and influences protein dynamics with advancing age.