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## Faculty Highlights

Inquiry Editors

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## Faculty Highlights

### Michelle Gray

Dr. Michelle Gray, PhD, is the former director of the University of Arkansas College of Education and Health Professions (COEHP) honors program. She has taught several courses in the exercise science field on campus for over 12 years. Alongside her teaching and research work, Dr. Gray has recently transitioned into the role of interim head of the department of health, human performance, and recreation.

Dr. Gray's recent research involves investigation of ailments relating to aging and their effects on the human body. A large part of Dr. Gray's project focuses on measuring lower-body muscular power and physical function in older adults, which has not been studied as much as it has been in younger individuals.

Dr. Gray utilized a specific kind of exercise equipment, the TENDO weightlifting analyzer, to calculate the power and speed of an older adult moving from a sitting to a standing position. Dr. Gray then validated TENDO to predict a person's lower body muscular power. Muscular power is important because it provides valuable information to health professionals about how to improve physical independence among older adults without causing injury.

"The things I knew were the things we were using for athletes, but I'm not going to put my grandmother through a 40-yard dash or a vertical jump," Dr. Gray remarked.



Dr. Gray is also currently investigating the relationship between the deterioration of physical and cognitive function in individuals at risk for Alzheimer's and dementia. Alongside a California-based startup group called NeuroTrack Technologies, Dr. Gray and her students are working to develop an app which regularly tests for early signs of Alzheimer's and dementia.

"My parents are in their mid 60s. I'm starting to see some of those negative changes, both in physical and cognitive function," Dr. Gray shared. "With this app, you can test yourself every day, every week, every

month. It's more accurate and realistic compared to the traditional cognitive test setting at a doctor's office."

Dr. Gray, who has mentored over 100 students at the UofA, said undergraduate research is a win-win situation for both the student and the professor. Dr. Gray has four undergraduate students in her lab who have been on her research team since they were freshman, and Dr. Gray implied getting involved early can also be very beneficial for a student's future plans.

She emphasized that any student involved in research gains added value on top of their educational experience at the university. Research students gain skills which Dr. Gray claims cannot be taught in the classroom at the undergraduate level, such as conflict resolution among classmates and the use of professional-grade equipment in a standard lab environment. Most importantly, Dr. Gray added, students get an opportunity to interact with human participants.

"I want folks to join my team, I don't want people to work for me," Dr. Gray said about her lab. "That may sound like it's the same, but I feel like it's completely different."

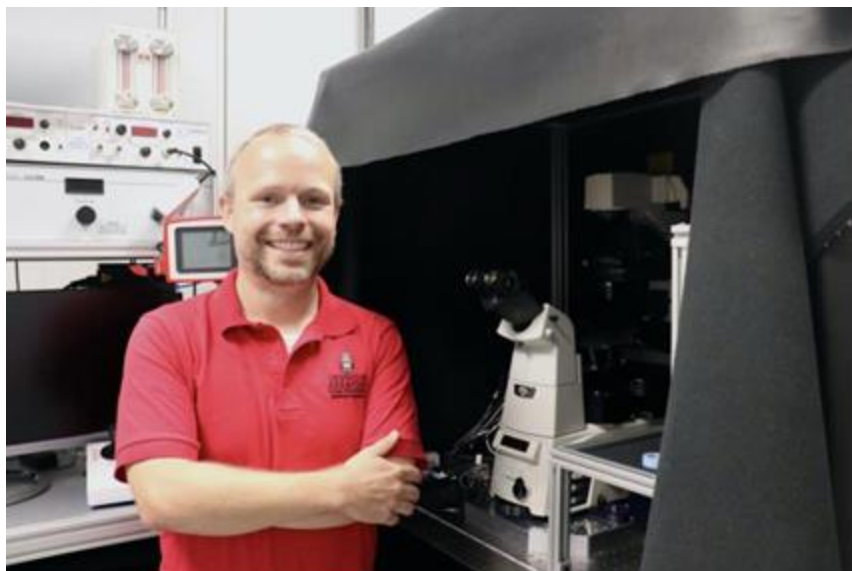
Dr. Gray is from a small farming community outside of Chattanooga, Tennessee, and received her PhD at UARK after completing her master's degree at Ball State University in Indiana. When Dr. Gray isn't teaching or in the lab, she enjoys biking in the NWA area.

### **Timothy Muldoon**

Dr. Timothy Muldoon teaches biomedical instrumentation and clinical observations and needs finding courses, which are core requirements for the biomedical engineering major at the University of Arkansas. Dr. Muldoon also teaches biomedical microscopy, which is a senior-level elective course that focuses on the usage and design of microscopes in laboratory environments.

Dr. Muldoon is originally from Michigan, but completed his PhD and MD work in Houston, Texas. He continued to serve as a postdoctoral research scientist with Dr. Elizabeth Hillman at Columbia University in New York, NY, before joining the University of Arkansas as a faculty in 2012.

Dr. Muldoon's research primarily focuses on the use of optical tools to probe and understand disease processes and their response to therapy on a cellular level. Dr. Muldoon discussed how his lab uses these imaging tools to study the role of macrophages in cancer, and how they respond to different therapies and immunotherapies.



“Cancer immunotherapy is one of the major pillars of cancer therapy,” Dr. Muldoon articulated, “but I think that understanding macrophage biology is going to be key to being able to extrapolate where we are currently with immunotherapy to a broader groups of patients.”

Dr. Muldoon’s work has been in developing miniaturized endoscopic imaging and spectroscopy systems. Using what he calls ‘optical biomarkers’, Dr. Muldoon and his students are able to view and interpret certain biochemical reactions under a microscope. This research could lead to the creation of drugs and treatment strategies that can directly target a population of cells for beneficial means.

Dr. Muldoon shared that while most of his current lab students may not continue in this specific field, basic research experience is vital to understanding any scientific process and can help a student go in many different directions. Dr. Muldoon also emphasized the importance of collaboration while working in a research environment.

“No one just sits in a vacuum and can come up with a brilliant idea that is unassailable, so I think you have to get used to having constructive criticism,” Dr. Muldoon stated. “That’s what I try to spend a lot of my efforts on my work with the undergraduate student researchers.”

In Dr. Muldoon’s free time, he enjoys spending time with his family, friends and colleagues.