

JEFFREY WOLCHOK, PHD, an associate professor in the Department of Biomedical Engineering at the University of Arkansas. He received his doctorate from the University of Utah and his bachelor's and master's degrees in mechanical engineering from the University of California at Davis. He directs an interdisciplinary research program focused on the design, development, and evaluation of extracellular matrix (ECM) biomaterials. His lab uses diverse themes in material science, mechanobiology, muscle biology, and regenerative medicine to develop biomaterial-based strategies targeting the repair of damaged skeletal muscle. Dr. Wolchok is a University of Arkansas Department of Biomedical Engineering founding faculty member and now serves as the Department Head. Starting with just 5 faculty in 2012, the Department has grown to 16 faculty members, 220 undergraduates, and 60 graduate students.



Dr. Jeffrey Wolchok

Associate Professor and
Department Head
University of Arkansas

Friday, October 6th | 9:00 AM | EC 2300

Regenerative Medicine Strategies for the Repair of Skeletal Muscle

ABSTRACT: When provided the appropriate regenerative cues, skeletal muscle has a robust capacity for repair. Following mild muscle damage (ex. strains, contusions, and lacerations) cells are damaged but the underlying extracellular matrix (ECM) is largely intact and regeneration at the injury site is complete. However, when significant muscle volume is lost (trauma, infection, or surgical resection) the cues provided by the ECM are missing and the injury site is instead replaced with non-contractile scar tissue. Termed volumetric muscle loss (VML), the bulk loss of skeletal muscle tissue overwhelms the body's capacity for regeneration leaving the patient with a functional deficit. Current soft tissue repair techniques and traditional rehabilitation have not been able to reverse the pathological changes that occur following VML injury. To re-establish the lost cues, our group and others are exploring VML treatment strategies that draw from the field of regenerative medicine (also termed tissue engineering). In particular, we are creating unique strategies to engineer ECM scaffolds that can be remodeled by the body's own wound healing machinery. To do so, I have utilized my engineering background to design and fabricate unique platforms that we use to collect the ECM that is secreted by cells in culture. We can form the ECM into sheets, foams, and fibers that can be used to repair damaged skeletal muscle. During my talk I will present the results of our group's efforts in this area as well as recent work targeting shoulder cuff muscle injury.



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, October 6th, 2023 | 9:00AM - 10:00AM | EC 2300

<https://bme.fiu.edu/seminars>