Abstract:
Adipose accumulation in and around muscles is a pervasive feature of muscle pathology. It has been extensively documented in humans with chronic rotator cuff tears, obesity, type 2 diabetes and muscular dystrophy where, across disorders, it is associated with reduced muscle strength and poor functional outcomes. However, the mechanism for this association remains undefined and at present there exist no effective therapies to reduce fat accumulation once it has developed. This presentation will discuss recent advances in measuring, modeling and manipulating fat accumulation in muscle injury and disease. Our work supports a direct link between fat accumulation and muscle contractile deficits that we hypothesize to be mediated by paracrine secreted adipokines. In-vivo, the secreted adipokine profile is neither uniform nor static, but varies with fat phenotype and environmental stimuli. Muscle-associated fat exhibits features of beige fat, a phenotype with high plasticity. Our work explores the potential for novel phenotype-directed therapies to modify the secreted adipokine profile and remodel fat-muscle signaling to promote muscle growth and functional recovery.

Bio:
Gretchen Meyer, PhD is the director of the Integrative Muscle Physiology lab at Washington University which focuses on defining the cellular basis for muscle pathology and designing novel therapeutic strategies at the cell and tissue level. This work combines her pre-doctoral training in skeletal muscle physiology with Dr. Rick Lieber and post-doctoral training in stem cell biology with Dr. Adam Engler at the University of California, San Diego. Current projects in the lab combine human tissues and cell models with in-vivo animal models to explore the role of extracellular matrix cues in adipose differentiation and browning and targeted activation of beige fat through biomaterial-based drug delivery. The lab is also part of the Musculoskeletal Research Center at Washington University, where Dr. Meyer is Associate Director of the Structure and Strength Core.