

# NEURAL ENGINEERING SEMINAR SERIES

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## Decoding Neurovascular Interactions in Musculoskeletal Tissue Regeneration

<https://psu.zoom.us/j/94639233394>

**Nov. 30, 2022**

12:15 -1:15 p.m. (E.T.)  
W306 Millennium Science



### Warren Grayson

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Faculty Affairs in Biomedical  
Engineering  
Johns Hopkins University  
School of Medicine

**ABSTRACT:** Tissue engineering provides a viable means of regenerating bone and skeletal muscle tissues following injuries that lead to large volumetric defects. Our lab has developed advanced biomaterial and stem cell-based approaches to promote functional recovery following volumetric muscle loss and critical-sized craniofacial bone injuries. This presentation provides a broad overview of three areas of ongoing research: (1) My lab aims to regenerate vascularized and innervated skeletal muscle to treat volumetric muscle loss. I will present aspects of our biomaterial design and testing in murine models using grafts engineered with cell lines and human pluripotent stem cells. (2) I will present the findings from a study focused on designing biomaterials to guide vascularized bone regeneration in situ in minipigs using intraoperative protocols for combining autologous stem cells with advanced 3D-printed scaffolds. (3) Understanding the interaction between vascular cells and osteoprogenitors is critical for developing effective treatment methods. I will describe recent studies in which we developed a quantitative imaging platform for characterizing the spatial relationships between cell populations in the native murine calvarium.

**BIOGRAPHY:** Dr. Warren Grayson is a Professor and Vice-Chair for Faculty Affairs in the Department of Biomedical Engineering at Johns Hopkins University. Prior to joining Johns Hopkins, he did his post-doctoral training at Columbia University and PhD at Florida State University. He is an elected fellow of the American Institute for Medical and Biomedical Engineering and has also been recognized by the National Academy of Medicine as an Emerging Leader in Health and Medicine.