

**University of Rochester
Department of Biomedical Engineering
Seminar Series**

Co-sponsored by the Center for Musculoskeletal Research

“Engineering Tissue-to-Tissue Interfaces”

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8:30 am

**River Campus
Robert B. Goergen Hall
Sloan Auditorium, Room 101**

Abstract

Musculoskeletal motion is facilitated by synchronized interactions between multiple tissue types and the seamless integration of bone with soft tissues such as tendons, ligaments or cartilage. Specifically, many of these soft tissues connect to bone through a multi-region fibrocartilaginous interface, which serves to minimize the formation of stress concentrations while enabling load transfer between soft and hard tissues. Given its functional significance, re-establishment of the soft tissue-to-bone interface is thus critical for promoting integrative soft tissue repair as well as the formation of multi-tissue systems. To address the challenge of engineering complex tissues and enabling biological fixation, our approach centers on interface tissue engineering, guided by the working hypothesis that the multi-tissue transition may be regenerated by controlled culture of interface-relevant cell populations on a stratified scaffold pre-designed with a biomimetic gradient of structural and functional properties. This lecture will discuss investigations into the structure-function relationship at the soft tissue-to-bone interface, which have yielded physiologically relevant scaffold design parameters for interface tissue engineering. In addition, both the design rationale and testing of stratified scaffolds for multi-tissue regeneration will be presented, along with a discussion of the potential mechanism regulating the formation and maintenance of tissue-to-tissue interfaces.