BiophysTO Lunchtime Seminar Series

Date
Thursday, Feb 14 2019
12:00 – 1:00 pm

Location
McLennan Physical Laboratories
Room MP606
60 St. George Street

Pizza and refreshments will be provided

Dr. Penney M. Gilbert

Institute of Biomaterials & Biomedical Engineering
University of Toronto

Biophysical regulation of skeletal muscle stem cell fate

The Gilbert Laboratory defines interactions between muscle stem cells and the dynamic extracellular milieu that serve to orchestrate the elegant process by which a muscle stem cell switches from a state of quiescence, to activation, and then to specification, and how this process becomes derailed in disease states and in aging. We put a specific emphasis on evaluating how biomechanical stresses, like compressive forces, shear stress, or extracellular matrix stiffness, synergize with niche proteins to drive stem cell behavior. The native stem cell niche is a three-dimensional (3D) entity. While conceptually it is accepted that dimensionality is a critical feature of tissues that defines the location and timing of cellular events, understanding how dimensionality exerts such a powerful influence on stem cell biology is not well understood. By quantifying in vivo biomechanical stresses presiding over the quiescent and regenerating adult skeletal muscle niche, and engineering new three-dimensional models of human skeletal muscle regeneration, we elucidate how the native three-dimensional tissue exerts spatiotemporal control over muscle stem cell fate. Our goal is to identify therapeutic interventions that boost skeletal muscle endogenous repair.

Host: Dr. Walid A. Houry

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