



Harnessing Inflammation to Promote Regeneration

Dr. Roshni Rainbow/Queen's University
Thursday, February 24, 2022, 2:30pm
Virtual Presentation

For decades, orthopaedic scientists have been working toward mimicking the developing human body's ability to generate musculoskeletal tissues and organs. While regenerative engineering offers hope of true recovery of structure and function, established strategies have been largely demonstrated as a proof-of-concept; the number of viable clinical treatments remains low. Orthopaedic tissue disease and damage may be accompanied by high levels of inflammation; thus, the successful translation of implantable repair technologies will require that the regenerating tissues remain stable and resistant to inflammatory damage in situ. Developmental biology aims to uncover the critical regulatory cues and pathways that mediate tissue formation in the developing human body, and studies have demonstrated that inflammatory signaling pathways play a key role in formation of the fetal musculoskeletal system. There remains limited understanding of inflammation's role in directing the fate of adult stem cells, a population that serves as an attractive cell source for regenerative engineering. These cells can readily expand ex vivo and be directed toward various musculoskeletal lineages, such as cartilage and bone. This research talk focuses on investigating whether it is possible to simulate the inflammatory signaling cascade present during development to direct adult stem cells to undergo and maintain differentiation towards these musculoskeletal lineages.