



Recapitulating Embryonic Development to Regenerate Tendon with Stem Cells

Speaker: Catherine K. Kuo, PhD, Associate Professor
Department of Biomedical Engineering, University of Rochester,
Department of Orthopaedics and Center for Musculoskeletal Research,
University of Rochester Medical Center

When: 4pm on Monday 14th of May 2018

Where: B2.72 & B2.73, TBSI

Tendons play critical roles in skeletal movement and stability, yet when injured are incapable of healing with normal functional properties. This seminar will discuss our research to advance tendon tissue engineering and regenerative medicine strategies by characterizing and recapitulating key aspects of embryonic tendon development and healing. Our studies reveal embryonic tendon progenitor cells exhibit anatomically specific behaviors when treated with developmental growth factors in vitro, and that their behaviors can be used as benchmarks by which to evaluate adult stem cell tenogenic differentiation. By characterizing structure-property relationships of the developing embryonic tendon, we have established novel markers with which to evaluate functional tendon formation and design parameters with which to engineer scaffolds that promote stem cell tenogenesis. In elucidating specific mechanisms of embryonic tendon mechanical property elaboration during development, we have identified putative targets that may be manipulated to enhance functional tendon formation in tissue engineering or healing approaches. Finally, recent work in the Kuo lab highlights how studying the embryo is motivating new approaches to enhance scarless tendon regeneration during healing.



Catherine K. Kuo is an Associate Professor at the University of Rochester in the Departments of Biomedical Engineering and Orthopaedics, and the Center for Musculoskeletal Research. Dr. Kuo is the recipient of numerous awards including Sweden's Go:Life Award for Innovation in Research (2015), *Stem Cell Research and Therapy* Emerging Investigator Award (2015), NSF CAREER Award (2013), and March of Dimes Basil O'Connor Starter Scholar Research Award (2011). Her research has been continuously funded by the National Institutes of Health (NIH), Department of Defense (DoD), National Science Foundation (NSF), March of Dimes Foundation, and Biogen Idec. She has been invited to speak by the National Academy of Engineering and the Royal Society of London. She serves on the editorial board for *Biomedical Materials*, the editorial review board for *Journal of Orthopaedics Research*, and is Research Chair for the Orthopaedic Research Society (ORS) Tendon Section and Topic Chair for Tendon on the ORS Program Committee. She received her B.S.E. in materials science and engineering and Ph.D. in biomaterials and macromolecular science and engineering from the University of Michigan and did her postdoctoral studies at the NIH.