

SEMINAR SERIES

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Structural and Mechanical Inhomogeneity in Arterial ECM: Implications for Physiology and Diseases

Featuring Dr. Katherine Zhang
Boston University



Friday, April 15 | 12:00 - 1:15 pm | BRB 167

<https://unomaha.zoom.us/j/92012305734>

PRESENTATION ABSTRACT

Large elastic arteries consist of concentric layers of elastic lamellae with inhomogeneously distributed elastic and collagen extracellular matrix (ECM) fibers, which endow the tissue its load bearing and damage resistance capacities. By integrating computational modelling, multiphoton imaging and quantification, and biomechanical characterization, our recent studies showed that ECM structural inhomogeneity exists at multiple structural levels, and there is a complex interplay between the multiscale ECM structural inhomogeneity and mechanics of arteries. In this talk, I will present some of these findings that reveal the important roles structural inhomogeneities play in contributing to tissue mechanics and homeostasis. Finally, structural inhomogeneity in transmural interlamellar fibers and the propagation of aortic dissection, and our recent study on cerebral arteries in Alzheimer's disease will be discussed.

ABOUT DR. ZHANG

Dr. Katherine Zhang is a Professor in the Departments of Mechanical and Biomedical Engineering, and Division of Materials Science and Engineering at Boston University. She received her BS degree in Engineering Mechanics from Tsinghua University; and her MS and PhD degrees in Mechanical Engineering from University of Colorado at Boulder, where she was also a postdoc for two years. In 2006, Dr. Zhang became an Assistant Professor at Boston University and established the Multi-Scale Tissue Biomechanics Laboratory. Her research focuses on vascular biomechanics and multiscale mechanics and mechanobiology of the extracellular matrix. Dr. Zhang was the recipient of many awards including a Clare Boothe Luce Assistant Professorship, DARPA Young Faculty Award, and NSF Faculty Early Career Development (CAREER) Award. Dr. Zhang is a Fellow of ASME and AIMBE.

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