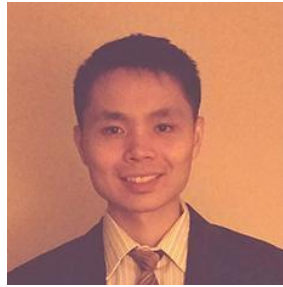


The Department of Mechanical Engineering
College of Engineering and Applied Sciences
Stony Brook University

Mechanical Engineering Seminar



Dr. Michael Mak, Associate Professor

Department of Biomedical Engineering, Stony Brook University

“Mechanobiological Systems: Multiscale Signaling and Biofabrication”

Friday, September 27th, 2024 at 1:00 PM, Room 173 Light Engineering Building

Abstract

Tissue microenvironments are complex and contain many biophysical and mechanical signals, ranging from simplistic mechanical properties such as stiffness to more complex features such as mesoscopic architectures, compression, and non-elastic material behaviors. These signals play critical roles in guiding cell states and tissue organization and function, and their dysregulation contributes to disease processes such as fibrosis and cancer progression. My lab focuses on both understanding how cells sense and respond to complex biophysical signals and constructing biomimetic systems that capture realistic tissue properties. In this talk, we discuss cell mechanosensing and adaptation to complex microenvironmental cues. We also discuss advanced biofabrication and bioprinting developments for controlling the assembly of physiological materials and the generation of tunable mechanobiological signals across multiple scales, enabling the production of (patho) physiologically relevant tissue and organ systems.

Biography

Michael Mak received his undergraduate degree from Brown University, followed by his Ph.D. at Cornell University in Biomedical Engineering and postdoctoral studies at MIT and Boston University. He is currently an Empire Innovation Associate Professor at Stony Brook University. His lab specializes in developing and applying integrated experimental-computational approaches to understand mechanobiological principles in development and disease. His lab also develops advanced biofabrication methods to generate realistic tissues and mini-organs, based on extensive considerations of mechanobiology and microenvironmental factors. Dr. Mak's research has been funded by multiple NIH awards.