BME Seminar Series

John Ngo, Ph.D.
Assistant Professor of Biomedical Engineering
Boston University

Date: Monday, February 24th, 2020
Time: 1:30 pm
Location: Traylor 709 Medical East Baltimore Campus
Video-teleconferenced to Clark Hall 110

Faculty Host: Reza Kalhor, Ph.D.


Bio: John Ngo studied under David Tirrell (Caltech) and was a post-doctoral fellow under Roger Tsien (UCSD). He began his appointment as Assistant Professor of Biomedical Engineering at Boston University in July 2015 and became the Reidy Family Career Development Professor in September 2016. His lab studies how molecules are organized within and between cells, with the goal of understanding how changes in organizations give rise to dynamic biological processes.

Abstract: The primary goal of our research program is to understand how cells sense and interpret mechanical information – a goal that we are pursuing through the development and implementation of new molecular tools. Ultimately, we aim to achieve a “multi-scale” understanding of mechanotransduction in which atomistic insights regarding the structure and biophysics of force-sensitive proteins is integrated with observations regarding the “mechanical landscape” of cells. A “holy grail” of these efforts is to gain a comprehensive appreciation of the molecular logic underlying natural mechanical signaling networks, with the ambition of applying such knowledge to engineer customized networks for application in biotechnology and cell-based medicine. In other words, we aim to enable, and realize “synthetic mechanobiology,” in which one is able to precisely program how cells sense and respond to mechanical forces. In this presentation I will describe our efforts toward this end, focusing on the development and implementation of tunable and modular mechanoreceptors based on the mammalian signaling protein Notch and its synthetic derivatives (‘SynNotch’). By combing structure-guided protein engineering with biophysical and cellular analyses, we have engineered a set of SynNotch proteins with which we have used to program human cells that are able to activate customized genetic programs in response to defined tensional cues.