

EML WEBINAR

ZOOM DISCUSSION: 271 079 684

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WEDNESDAY, 11 NOVEMBER 2020

9:30 AM BOSTON, 2:30 PM LONDON

3:30 PM PARIS, 10:30 PM BEIJING



SULIN ZHANG

THE PENNSYLVANIA STATE UNIVERSITY

MECHANOBIOLOGY: A TALE OF STRESSED LIFE

Living organisms live through the active flow of energy and matter, featuring collective molecular interactions on an energy scale of $(k_B)T$. Tiny mechanical forces, endogenous or exogenous, could easily change the energy landscape and redirect the flows, driving the living systems further out of equilibrium while creating orders far from equilibrium. Measuring such small forces and understanding their physiological implications in living organisms remains a grand challenge. This webinar presents how mechanical forces are sensed, generated, transmitted, and sustained in biological cells and tissues, and how these forces modulate the biochemical processes and cellular functions. Examples will be given to highlight how the mechanics-biochemistry crosstalk is regulated in development and repair and dysregulated in disease and injury. The fundamental understanding of the mechanics-biochemistry synergy in living organisms underlies materials design, disease control, and nanomedicine innovation.

Sulin Zhang received his BS from Dalian University of Technology in 1994, MS from Tsinghua University in 1997 under Wei Yang, and PhD from the University of Illinois, Urbana-Champaign in 2002 under K. Jimmy Hsia, all from Engineering Mechanics. He then worked as a postdoctoral fellow in Northwestern University with Ted Belytschko. He started as an assistant professor in University of Arkansas from 2005-2007, and is currently a Professor in Department of Engineering Science and Mechanics and Department of Biomedical Engineering at Penn State University. His research interests lie in the roles of mechanical forces and stresses in materials, chemistry, and biology. He is the recipient of the Early Career Development Award from National Science Foundation in 2007, the PSEAS Outstanding Research Award in 2016 from Penn State. Dr. Zhang is serving as an Associated Editor for Extreme Mechanics Letters, and an editorial board member for NPJ-Computational Materials.

Discussion leader: **Teng Li**, University of Maryland

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