



College of Engineering
Department of
Mechanical & Industrial Engineering

The Sidney E. Fuchs Seminar Series

3:00-4:00pm, Friday, October 27, 2017
1100 Patrick F Taylor Auditorium



Bioinspired Multiscale Systems for Tissue Regeneration and Cancer Therapy

by **Xiaoming "Shawn" He***

Professor, The Ohio State University

Over the past decades, tremendous advancements have been made in discovering new therapeutic agents for medicine from the traditional small molecules to peptides/proteins, genetic materials, and more recently cells and tissues. However, the challenge to safely and effectively deliver these agents from their procurement to the clinical use in human body is still enormous. The issues range from poor bioavailability, systemic toxicity, and low specificity for the acellular agents, to poor survival after long-term storage, non-physiological cultivation *in vitro*, and immune rejection *in vivo* for cell-based medicine. We have been working on addressing these issues facing today's medicine using a bioinspired multiscale engineering approach. In this talk, I will show our recent data on developing and utilizing novel bioinspired multiscale systems to engineer various normal and cancer stem cells and immune cells for treating ischemic diseases, modulating immune reactions, and fighting against cancer.

* Xiaoming "Shawn" He is a Professor of Biomedical Engineering at The Ohio State University (OSU), Columbus, Ohio. He received his B.S. and M.S. degrees in Thermal and Fluid Engineering from Xi'an Jiaotong University in 1995 and 1998, respectively. After teaching for two years in Beijing University of Technology, he went to the University of Minnesota-Twin Cities in 2000 for doctoral studies and obtained his Ph.D. degree in Mechanical Engineering in 2004. He then conducted postdoctoral training from 2004-2007 at Harvard Medical School and Massachusetts General Hospital, followed by working as an Assistant Professor at the University of South Carolina from 2007-2011 and as an Associate Professor and later Professor at OSU since 2011. His current research is focused on developing micro and nanoscale biomaterials and devices to engineer totipotent, pluripotent, and multipotent stem cells for tissue regeneration, cancer therapy, and assisted reproduction. His research has been funded with him as the PI by various private foundations and government agencies including American Cancer Society (ACS Research Scholar Grant), NSF (two standard grants), and NIH (four R01 grants). He has published more than 95 peer-reviewed articles in high ranking journals such as *Nature Communications*, *ACS Central Science*, *Advanced Materials*, and *ACS Nano*, in addition to one book and three book chapters. He is an associate editor of *Journal of Medical Devices* and is serving as the Vice Chair/Chair Elect of the American Society of Mechanical Engineers (ASME) Biotransport Committee.