

Pharmaceutical Sciences Special Seminar

Wednesday, September 18, 2019

2548 North University Building

4:00-5:00 pm

**“Discovery and Translation of the Cell Membrane**

**Coating Nanotechnology”**



Presented by:

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**University of California San Diego**

**Abstract:** The emerging nanotechnology in biomedicine has sparked new hope for the treatment and diagnosis of various important human diseases. However, development of functional nanomaterials and nanodevices can be encumbered by unanticipated material properties and biological events, which can negatively impact their effectiveness when introduced into complex, physiologically relevant systems. In this talk I will report on the preparation of a polymeric nanoparticle enclosed in the plasma membrane of natural human cells (e.g., RBCs, platelets, cancer cells, etc). The resulting cell membrane-coated nanoparticles are demonstrated to possess many surface functions of natural cells via studies of interactions with plasma proteins, cells, tissues, and microorganisms. Such multifaceted cell-mimicking properties can be attributed to the preservation of biomembrane on nanoparticle surfaces, which facilitates the display of intricate biochemistry that is difficult to replicate using conventional functionalization approaches. As the platform is entirely biocompatible and biodegradable, it can be applied toward a myriad of biomedical applications, including drug delivery, detoxification and vaccination, where the vast implications of cell surface properties benefit a variety of disease treatments.

**Biography:** Dr. Liangfang Zhang received his B.E. and M.S. degrees in Chemical Engineering from Tsinghua University, and his Ph.D. in Chemical & Biomolecular Engineering from the University of Illinois at Urbana-Champaign in 2006 under the supervision of Prof. Steve Granick. He was a postdoctoral associate in the laboratory of Prof. Robert Langer at MIT during 2006-2008.  He joined the Department of Nanoengineering at UC San Diego as an Assistant Professor in July 2008 and was promoted Professor in July 2014. Dr. Zhang’s research interests focus on biomimetic nanomedicine, with a particular interest in creating and evaluating nanostructured biomaterials for drug delivery, detoxification and vaccination for treatment of infectious diseases and cancer. He has published 184 peer-reviewed articles and holds 60 issued/pending patents. He received the ACS Victor K. LaMer Award (2009), UCSD Jacobs School of Engineering Best Teacher Award (2011), ACS Unilever Award (2012), MIT Technology Review’s TR35 Innovator Award (2013), AIChE Allan P. Colburn Award (2014), AIMBE Fellow (2015), Popular Science’s Brilliant 10 Award (2016), U.S. Department of State ASPIRE Award (2017), Kabiller Young Investigator Award (2017), and AAAS Fellow (2018).

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