

## UC SAN DIEGO NANOENGINEERING SEMINAR

Friday, April 26, 2019

Seminar Presentation: 10:00am – 11:00am

**SME 248**

### “Semiconducting Polymer Nanoparticles for Biomedical Applications”



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**Abstract:** The convergence of medicine and nanotechnology has been providing new opportunities to better understand fundamental biology, monitor health, perform diagnosis and treat diseases. Semiconducting polymer nanoparticles (SPNs) transformed from optically and electrically active polymers have emerged as a new class of optical nanomaterials. As those polymers are completely organic and biologically inert, SPNs essentially circumvent the issue of heavy metal ion-induced toxicity to living organisms, possessing good biocompatibility. In this talk, I will present the biomedical applications of SPNs ranging from advanced molecular imaging, to cancer phototherapy, and to controlled photoregulation of biological processes. In preclinical settings, SPNs can be developed into background-free smart optical probes for real-time in vivo evaluation of drug-induced hepatotoxicity, a long-standing concern of modern medicine; in clinical settings, they can be potentially used as self-luminescent agents for afterglow imaging guided surgery including lymph node mapping and tumor imaging, providing the sensitivity level that is more than 100-times higher than near-infrared fluorescence imaging. In addition, the photodynamic and photothermal properties of SPNs not only leads to photomedicines but also allow them to serve as signal transducers for regulation of biological processes in living animals. Thus, the biophotonics of SPNs will not only advance our understanding in biology but also sharpen our diagnostic and therapeutic tools in medicine.

**Biosketch:** Dr. Kanyi Pu has been an Associate Professor in the School of Chemical and Biomedical Engineering (SCBE) at Nanyang Technological University since June 2015. He did his MS (2007) at Fudan University in China, and his PhD (2011) at National University of Singapore in Singapore. He moved to Stanford University School of Medicine for his postdoctoral study in 2011.

Dr. Pu has published more than 133 journal papers, 3 book chapters and 6 patents. With a h-index of 56 (March 2019). He has won a number of awards for his creative work, including the distinguished lectureship award from the Chemistry Society of Japan, Wiley award for contribution in bioscience, young investigator travel award, and young innovator award in nanobiotechnology by Nano Research.

Dr. Pu serves as the associate editor for ACS Applied Polymer Materials, and sits on the editorial advisory board of Advanced Functional Materials, Bioconjugate Chemistry, ACS Applied Bio Materials, Advanced Biosystems, and ChemNanoMat.