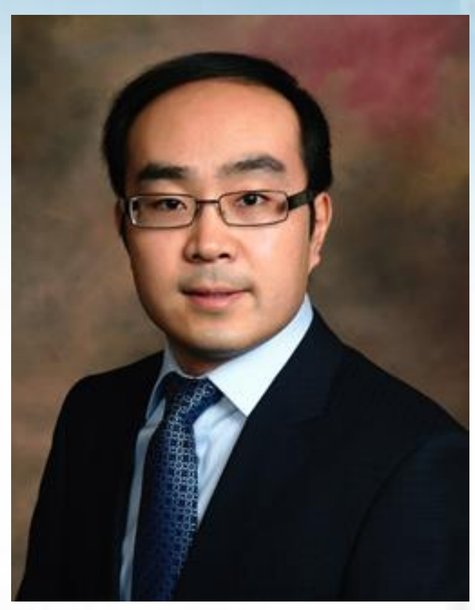
Amplified Photoacoustic Imaging and Photothermal Therapy using Organic Semiconducting Nanoparticles

State Key Laboratory of Chemical Resource Engineering



报告人：Dr. Kanyi Pu (浦侃裔) (Associate Professor，Nanyang Technological University)

时　间：2016-07-04（周一）3:00 PM-4:30 PM

地　点：化新楼B座 211（篮球场北侧）

Biography:

Dr. Pu joined the School of Chemical and Biomedical Engineering (SCBE) at NTU as an Associate Professor in June 2015. He did his MS (2007) with Prof. Wei Huang (CAS member) at Fudan University in China. He then came to Singapore and did his PhD (2011). He moved to Stanford University School of Medicine for his postdoctoral study in 2011, under the supervision of Prof. Jianghong Rao and the directorship of Prof. Sanjiv Sam Gambhir at the molecular imaging program at Stanford (MIPS). As an active member of MIPS and the Center for Cancer Nanotechnology Excellence and Translation (CCNE-T), he made significant contributions to organic polymer based imaging probes and technologies, such as photoacoustic imaging, chemiluminescence imaging and in vivo imaging of reactive oxygen and nitrogen species.
Dr. Pu has published more than 60 journal papers, 2 book chapters and 6 patents. With a h-index of 36, his work on molecular imaging and bionanotechnology has been highlighted by many world-renown scientific journals such as Nature Biotechnology, Nature Methods, and Cell Express el al.. He has won a number of awards for his creative work, including a young investigator travel award and several best poster awards.

Abstract:

Optical theranostic nanoagents that seamlessly and synergistically integrate light-generated signals with photothermal or photodynamic therapy can provide opportunities for cost-effective precision medicine, while the potential for clinical translation requires them to have good biocompatibility and high imaging/therapy performance. Semiconducting polymer nanoparticles (SPNs) have emerged as a category of new optical nanomaterials that can be easily transformed from hydrophobic semiconducting polymers (SPs). As optoelectronically active SPs are completely organic and biologically benign, SPNs intrinsically circumvent the issue of heavy metal ion induced toxicity to living organisms and thus possess good biocompatibility. In this talk, we will demonstrate how to capitalize on the intraparticle engineering approach to develop SPNs into theranostics for amplified imaging and therapeutic applications. In particular, the design principle of the nanoparticles will be revealed along with their biomedical applications in photoacoustic imaging and photothermal therapy of tumor in living mice. Our work not only introduces a new category of purely organic optical theranostics but also provides a molecular guideline to amplify the effectiveness of light-intensive imaging and therapeutic nanosystems.that members of this class may prove to be useful biomaterials in the future.

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