学术报告

题 目: Vibrational Spectroscopic Imaging of Living Systems: Emerging Platform for Biology and Medicine

报告人: Prof. Ji-Xin Cheng
Purdue University, USA

时 间: 5 月 5 日（周二）上午 10: 00

地 点: 卢嘉锡楼报告厅（202）

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固体表面物理化学国家重点实验室
化学化工学院
4 月 28 日

Vibrational Spectroscopic Imaging of Living Systems: Emerging Platform for Biology and Medicine

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Abstract:

Current medical imaging modalities rely on differences in tissue properties rather than on chemical-content changes deep inside the body. Consequently, a biopsy is routinely needed for ultimate diagnosis of a malignancy. Thus, we need noninvasive imaging technologies that can be used *in vivo* and can determine in real time the chemical content of deep-tissue.

Vibrational spectroscopy has been a powerful tool for quantitative analysis of molecules in gas phase or solutions and has been deployed for label-free analysis of excised biological tissues. Yet, applying vibrational spectroscopy to non-invasive in vivo imaging, from single live cells to the human body, is still difficult. I will present our persistent efforts in developing in vivo spectroscopic imaging platforms that have been enabling groundbreaking biological discoveries and paradigm-shifting diagnosis strategies. Specifically, I will present coherent Raman scattering microscopy for real-time spectroscopic imaging of living cells, vibration-based photoacoustic endoscopy/tomography for bond-selective imaging of deep tissues, and transient absorption imaging of nanomaterials.

Brief Bio:

Ji-Xin Cheng was born in Jixi, Anhui Province, P. R. China in 1971. He attended University of Science and Technology of China (USTC) from 1989 to 1994. From 1994 to 1998, he carried out his PhD study on bond-selective chemistry under the supervision of Qingshi Zhu at USTC. As a graduate student, he worked as a research assistant at Universite Paris-sud (France) on vibrational spectroscopy and the Hong Kong University of Science and Technology (HKUST) on quantum dynamics theory. After postdoctoral training on ultrafast spectroscopy in Yijing Yan's group at HKUST, he joined Sunney Xie's group at Harvard University as a postdoc, where he and others developed CARS microscopy that allows high-speed vibrational imaging of cells and tissues. Cheng joined Purdue University in 2003 as Assistant Professor in Weldon School of Biomedical Engineering and Department of Chemistry, promoted to Associate Professor in 2009 and Full Professor in 2013. He was appointed as Scientific Director of Label-free Imaging at Purdue's Discovery Park in 2014.