

平成 30 年 1 月 30 日

大学院学生各位
To All Graduate Students

平成 29 年度
基盤医学特論 開講通知
Information on Special Lecture Tokuron AY2017

題目 : Upconversion Nanocrystals: A New Class of Luminescent Probes for Molecular and Biomedical Imaging

**講師 : LIU Xiaogang, PhD.
Professor, National University of Singapore**

日時 : 平成 30 年 2 月 15 日 (木) 14:00—15:30

Time and Date: 14:00—15:30 15th February (Thu), 2018

場所 : 環境医学研究所 北館セミナー室 (東山キャンパス)

Room: Research Institute of Environmental Medicine, North Building, N201 (Higashiyama Campus)

* 関係講座部門等の連絡担当者 : 環境医学研究所・神経性調節学 山中章弘 (3864)

Contact: Akihiro Yamanaka (3864)

使用言語 : 英語 *事前連絡は不要です。Lecture in English. No registration required.

Lanthanide-doped nanoparticles exhibit unique luminescent properties, including a large Stokes shift, a sharp bandwidth of emission, high resistance to optical blinking, and photobleaching. Uniquely, they can also convert long-wavelength stimulation into short-wavelength emission. These attributes offer the opportunity to develop alternative luminescent labels to organic fluorophores and quantum dots. In recent years, researchers have taken advantage of spectral-conversion nanocrystals in many important biological applications, such as highly sensitive molecular detection and autofluorescence-free cell imaging. With significant progress made over the past several years, we can now design and fabricate nanoparticles that display tailorable optical properties. In particular, we can generate a wealth of color output under single-wavelength excitation by rational control of different combinations of dopants and dopant concentration. By incorporating a set of lanthanide ions at defined concentrations into different layers of a core-shell structure, we have expanded the emission spectra of the particles to cover almost the entire visible region, a feat barely accessible by conventional bulk phosphors. In this talk, I will highlight recent advances in the broad utility of upconversion nanocrystals for multimodal imaging, bio-detection, display and photonics.

参考文献

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2. X. Qin et al. *Chemical Reviews* 2017, 117, 4488–4527.
3. B. Zhou, B. Shi, D. Jin, X. Liu *Nature Nanotechnology* 2015, 10, 924-936.
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5. F. Wang et al. *Nature* 2010, 463, 1061-1065