



**The Chinese University of Hong Kong
Biomedical Engineering Seminars Series**

Time: 2:30pm, 1 Mar 2017 (Wed)

Venue: Rm. 222, Ho Sin Hang Engineering Building, CUHK



**20 years of Quantum Dots for Biophotonics and
Nanomedicine**

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Abstract

During the last 20 years, QDs have been applied in healthcare applications such as cancer imaging, lymph node mapping and brain diseases therapy. These nanocrystals can be engineered to serve as a platform for challenges in highly sensitive optical diagnostic tools, biosensors, and guided imaging and therapy. QDs are luminescent semiconductor particles in the nanometer sizes and they possess many unique optical properties, which have significant advantages over traditional organic dyes as luminescence marker for biological applications. For example, QDs that fluoresce in different colors can be simultaneously excited with a single light source, with minimal spectral overlap. In addition, QDs can be made to emit in a range of wavelengths by changing their size, shape, and composition. This flexibility in optical tuning allows QDs to emit from visible to near-infrared (NIR) region, an essential characteristic for tailoring specific needs in biophotonic applications. In this talk, we will highlight the use of QDs with different sizes, compositions, and shapes for biophotonic and nanomedicine applications (e.g. guided bioimaging, multimodal imaging, sensing, in vivo surgery, gene delivery, etc). Also, we will discuss important factors to be considered when designing bioconjugated QDs for in vitro and in vivo applications and the future trend of using QDs in the biophotonic and nanomedicine field. Certainly, the in vitro and in vivo nanotoxicity of QDs will be one of the main challenges to be overcome in the near future if we would like/want to pursue in vivo biophotonic or nanomedicine technologies with QDs. The toxicity assessment of QDs in cell culture and animal models will be presented. This talk is intended to promote the awareness of past and present developments of QD in biomedical fields, the potential toxicity of QDs, and the approaches to engineer new types of QDs, whereby encouraging researchers to think about exciting and promising biophotonic and nanomedicine applications with QDs in the near future.

Biography

Dr. Yong is an Associate Professor in the School of Electrical and Electronic Engineering at the Nanyang Technological University. He also serves as the Director of the Bio Devices and Signal Analysis (VALENS). He is the Fellow of Royal Society of Chemistry, Fellow of Royal Society of Biology and Overseas Fellow of Royal Society of Medicine. Dr. Yong has published more than 165 articles in journals, 7 book chapters and 50 conference papers. He has filed more than 10 patents and some has been licensed. His scholarly papers appear in peer-reviewed journals such as Chemical Reviews, Chemical Society Review, Nature Nanotechnology, Advanced Materials, Coordination Chemistry Reviews, Advances in Optics and Photonics, ACS Nano, Nano Letters, Small, etc. Currently, his research group interests include engineering nanomaterials for biophotonic and nanomedicine applications, nanotoxicity and pharmacokinetics of nanoparticles, fabricating miniaturized devices for drug delivery, developing nanosensors for biodetection, and creating devices for nanophotonics studies.

*****ALL ARE WELCOME*****