The Chinese University of Hong Kong

Department of Biomedical Engineering

Time: 2:30 pm, 20 Dec 2017 (Wed)

Venue: Room 215, William M.W. Mong Engineering Building, CUHK

Engineering Multifunctional Nanoparticles for Disease Detection and Therapy

Prof. Gang Bao

Foyt Family Chair Professor , Department of Bioengineering

Rice University, USA

CPRIT Senior Scholar, Director of Nanomedicine Center,

Nucleoprotein Machines

Abstract

The integration of biomolecular engineering, nanotechnology and biology is expected to produce major breakthroughs in medical diagnostics and therapeutics. Due to the size-compatibility of nano-scale structures with proteins and nucleic acids, the design, synthesis and application of nanoprobes, nanocarriers and nanomachines provide unprecedented opportunities for achieving a better control of biological processes, and drastic improvements in disease detection, therapy, and prevention. Recent advances include the development of multi-functional nanoparticles, nano-structured materials and devices, and engineered nucleases for biological and medical applications.

In this talk I will present the recent development and application of magnetic nanoparticles in my lab, including multi-modality PET/MR/fluorescence imaging contrast agent for disease detection, heat generation by magnetic iron oxide nanoparticles, nanoparticle-based stem cell targeting, and nanocarriers for drug/gene delivery. The opportunities and challenges in nanobioengineering are also discussed.

Biography

Dr. Gang Bao is the Foyt Family Chair Professor in the Department of Bioengineering, Rice University. He is a CPRIT Senior Scholar and the Director of Nanomedicine Center for Nucleoprotein Machines at Rice. Dr. Bao received his undergraduate and Master's degrees from Shandong University in China, and his PhD from Lehigh University in the US. Dr. Bao is a Fellow of the American Association of Advancement in Science (AAAS), American Society of Mechanical Engineers (ASME), American Physical Society (APS), American Institute for Medical and Biological Engineering (AIMBE), and Biomedical Engineering Society (BMES).

Dr. Bao's current research is focused on the development of nanotechnology and biomolecular engineering tools for biological and disease studies, including molecular beacons, magnetic nanoparticle probes, quantum dot bioconjugates, protein tagging/targeting methods, and engineered nucleases such as CRISPR/Cas9. These approaches have been applied to the diagnosis and treatment of cancer and cardiovascular disease, and the development of genome editing approaches for treating single-gene disorders.

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

For enquiries, please contact Ms. Christine Ko, Department of Biomedical Engineering at 3943 8278.