College of Science and Engineering

Department of Biomedical Sciences

Seminar

Developing Fluorescent Probes and Peptide-based Materials for Biological Applications

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Date: 10 November 2016 (Thursday)

Time: 12:00 nn – 1:30 pm (Reception with light sandwiches starts at 11:45 am. To facilitate the order of sandwiches, please register through email yyfung2222@cityu.edu.hk.)

Venue: B6605, Academic 1, City University of Hong Kong

Language: English

Abstract

Synthetic fluorescent probes have come forth as versatile tools that can help researchers to gain insight into the roles of biomolecules in various diseases. Designing and discovering selective chemical probes for biomolecules has become a topic of active investigation in recent years. In the first part of my talk, I will present several examples to illustrate how synthetic fluorescent probes are designed and utilized for biological investigation. In one example, we have designed a new thiol fluorescent probe by introducing dual-reactive and dual-quenching groups to the same fluorophore. The as-designed probe showed improved sensitivity as well as enhanced selectivity. In another example, we have discovered a minimalist fluorescent probe 4F-2CN. The probe allows differentiation of the three highly homologous thiol species (Cys/Hcy/GSH) in living cells using a single fluorescent probe.

Peptide-based biomaterials have attracted strong interest due to their prominent properties such as biocompatibility, biodegradability and non-immunogenicity. Recently we have designed a new stimuli-responsive drug delivery system by introducing peptide-functionalized AuNPs to mesoporous silica nanoparticles. The resulting hybrid delivery system exhibits endo/lysosomal pH-triggered drug release, and the incorporation of RGD peptide facilitates targeting delivery to αvβ3 integrin-overexpressed cancer cells. In another example, we have designed the first hydrogel system that shows selective response to hydrogen sulphide (H_2S). The as-designed peptide precursor was able to produce hydrogels at a concentration of as low as 0.1 wt%. It could then be fully degraded in the presence of excess H_2S. We envision that the various chemical tools developed by our lab can be helpful for further advancement of biomedical research.

Biography

Dr. Sun received her B.Sc from Wuhan University and Ph.D from National University of Singapore. Her Ph.D research focused on systematic enzyme profiling under the supervision of Professor Shao Qin Yao. After receiving her doctorate, she was granted a fellowship by Humboldt Foundation and carried out postdoc research with Professor Herbert Waldmann at Max Planck Institute of Molecular Physiology. She joined the City University of Hong Kong in 2011. Her current research focuses on designing novel fluorescent probes and peptide-based materials for biological applications.

**** All ARE WELCOME ****

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