



The Chinese University of Hong Kong
Biomedical Engineering Seminars Series

Time: 10:30am-11:30am, 19 Apr 2016 (Tue)

Venue: Rm.513, William M.W. Mong Engineering Building, CUHK



Tough Polymer Hydrogels for Soft Actuators

Prof. Jun Fu

Biomedical Polymers

**Ningbo Institute of Materials Technology &
Engineering, Chinese Academy of Sciences**

Abstract

Hydrogel actuators have great potentials in soft robotics and devices. Key challenges remain on the toughening and assembling of hydrogels for convenient fabrication and manipulation of such soft devices. In this talk, various tough hydrogels based micro-micelle crosslinking, clay toughening, and biomimetic structures are presented. Besides, hydrogels carrying charges are synthesized with both outstanding mechanical properties and responsiveness to changes in ion strength and/or pH. Moreover, electrostatic attraction and supramolecular recognition are utilized to establish a robust interface, which facilitates a convenient macroscopic assembling of hydrogels into bilayers. The bilayers, with each side responding differently upon changes in environmental stimuli, experience reversible actuations.

Biography

Dr. Jun Fu received his PhD degree in Polymer Chemistry and Physics from Changchun Institute of Applied Chemistry, Chinese Academy of Science (CAS) in 2005. Then he moved to Max Planck Institute for Polymer Research in Mainz, Germany, and, in 2007, he joined the Massachusetts General Hospital/Harvard Medical School as a Research Fellow, working on high performance polymers for joint implants. In 2010, Dr. Fu was appointed as a full professor of biomedical polymer materials in the Ningbo Institute of Materials Technology, CAS. He has been making innovative research on tough and functional polymer materials for biomedical applications. He has developed a series of tough, responsive, and biofunctional polymer hydrogels that respond to environmental stimuli and/or provide excellent supports to preferential adhesion, growth, and proliferation of cells, with a purpose for applications to cartilage replacement, regeneration and repair.

To date, Prof. Fu has co-authored more than 80 peer-reviewed scientific journal papers in Chem Mater, ACS Appl Mater Interf, Chem Commun, Macromolecules, ACS Macro Lett, and J Mater Chem B, etc., and received more than 2000 citations. He is a member of American Chemical Society, Materials Research Society, Chinese Chemical Society, and Chinese Biomedical Materials Society.