



Interfacing Polymer Particle Design and Biological Interactions for Therapeutic Delivery



State Key Laboratory
of Chemical Resource Engineering

Speaker : Jiwei Cui (Senior Scientist, University of Melbourne)

Time: 2016-07-08 (周五) 10:00 AM-11:00 AM

Location: 化新楼B座 211 (篮球场北侧)



Biography:

Jiwei Cui is a senior research fellow in the Department of Chemical and Biomolecular Engineering at the University of Melbourne. He is also Vice President of the Chinese Association of Professionals and Scholars, Australia (CAPS Australia). He received his Ph.D. (Colloid and Interface Chemistry) from Shandong University in China in 2010. He was a Super Science Fellow at The University of Melbourne from 2011-2014 and was elected as a 1000 Young Talent Fellow in China in 2016. He has published over 60 peer-reviewed papers. He is a Next-Generation Advisor of Chem (Cell press).

Abstract:

Polymer carriers with biocompatibility, stealth property, good targeting ability, and biological responsiveness have received a great interest in therapeutic delivery systems for biomedical applications. This presentation will show the strategies to generate multifunctional polymer particles aimed for improving therapeutic efficacy. Recent studies have been focused on mesoporous silica templating method to fabricate polymer carriers with customised material properties allowing for control over the particle size, shape, structure, elasticity, surface chemistry, the types of loaded therapeutics, and different biological responsiveness (e.g., enzyme, pH, reduction). For example, the deformability and stealth property of the engineered particles (i.e., PEG particles) are favourable for increasing particle circulation time in vivo. Surface modification of polymer particles with targeting molecules (e.g., antibody) can improve the specific biological interactions. For therapeutic delivery, both hydrophilic and hydrophobic anticancer drugs have been encapsulated into the polymer particles, which led to drug release in the response to biological triggers and resulted in cytotoxicity in cancer cells. It is expected that the reported particle systems represent a novel paradigm for the delivery of drugs and vaccines.