Nanoformulations for cytokine sensing: from surface functionalization to medical device development

Dr. Guozhen Liu,
ARC Centre of Excellence for Nanoscaled Biophotonics (CNBP), Macquarie University

Abstract
Cytokines secreted from cells play critical roles in tissue repair, cancer development and progression. Unfortunately, probing what cells “see”, and what they secrete as they respond in real time to the surrounding signals is still a major challenge. The ultra-low concentration of cytokine (in the pM range), and extremely dynamic, transient cytokine secretion process make cytokine quantification even difficult. By integrating with nanotechnology, biosensors as the analytical devices for the detection of an analyte, that combines a biological component with a physicochemical detector, have demonstrated huge potential for cytokine sensing. In this talk, Liu will summarize her recent research highlights on development of biosensors for detection of cytokines. Firstly, Liu will discuss nanofabrication of sensing interfaces for improving the sensitivity, stability, selectivity and antifouling properties. Then Liu’s talk will present some assay examples for cytokine sensing. Finally Liu will detail the development of optical fibre based biological detection device for spatially localized cytokine monitoring.

Biography
Dr. Guozhen Liu is an ARC Future Fellow, who holds a Master degree (2000) in Analytical Chemistry from the China University of Geosciences, and a PhD (2006) in Chemistry from Prof Justin Gooding’s group at the University of New South Wales (UNSW). Dr. Liu conducted her postdoctoral research at CSIRO (2006-2008) and UNSW (2008-2010), respectively before she accepted a full time position of Associate Professor at the Central China Normal University (CCNU, chem.ccnu.edu.cn/info/1061/1197.htm). Meanwhile, Dr. Liu achieved her industrial experience as the R&D Manager, China (2011-2015) on developing medical devices at AgaMatrix Inc., a US based company for making glucose test strips and glucose meters. Before Liu was awarded the ARC Future Fellowship, Liu worked as the Research Fellow of ARC Centre of Excellence for Nanoscale BioPhotonics (CNBP) (2015-2016). Liu has attracted more than $1.7M research funding from both Australia and China.