



The Chinese University of Hong Kong
Department of Biomedical Engineering



Time: 1:15pm, 20 Dec 2017 (Wed)

Venue: Room 1009, William M.W. Mong Engineering Building, CUHK



Modulating immune microenvironment for tissue regeneration

Prof. Chunming WANG

**Assistant Professor & Programme Director
Institute of Chinese Medical Sciences
University of Macau, Macau SAR, China**

Abstract

Traditionally best known as defenders, the innate immune cells are also key regulators of tissue homeostasis. Macrophages, as well as monocytes and neutrophils, secrete abundant cytokines and create a dynamic microenvironment that dictate a broad range of processes such as wound healing, bone development and cancer metastasis. Because the phenotype of these cells can be highly plastic in response to varying biochemical and physical stimuli, it may be feasible to devise molecular tools to manipulate their activity and further harness their power to mediate tissue regeneration.

Towards this goal, our laboratory have been working on immune-driven tissue regeneration in three aspects. First, targeting the abundant, glucan/mannan-recognising receptors on macrophages, we have devised a series of glucomannan polymers that can stimulate macrophages to secrete pro-osteogenic cytokines. Fabricated into coating material or porous scaffold, these polysaccharides exert different functions in inducing osteogenesis and bone repair. Second, targeting the platelet-derived growth factor (PDGF) secreted by macrophages, we have identified a naturally-derived polysaccharide fraction with PDGF-binding affinity and engineered it into an eletrospun fibrous scaffold to sequester endogenous PDGF for wound healing. Third, inspired by tumour's escaping from immune surveillance, we have created an 'immunosuppressive enclave' in vivo for supporting xenograft tissue development. In summary, our studies endeavour to establish different biomaterials-based approaches in modulating the immune microenvironment, and evaluate their effects and implications in directing tissue regeneration.

Biography

Dr Chunming Wang (CM) received his Bachelor and Master's degrees in Biochemistry from Nanjing University (China) and obtained his PhD in Biomedical Engineering from Nanyang Technological University (Singapore). Then, CM undertook his postdoctoral training at the University of Cambridge (UK), working between Chemistry Department and Wellcome Trust Centre for Stem Cell Research, before returning to Singapore to join the Agency for Science, Technology and Research (A*STAR) on a drug discovery project in collaboration with industry. In October 2012, CM took the Assistant Professorship at the University of Macau, to continue his scientific exploration in developing bio-inspired materials for a wide range of medical applications. His research has been funded by Macau Science and Technology Development Fund (FDCT), National Natural Science Foundation of China (NSFC), University of Macau Research Committee as well as Nanjing University, China. To date, he has published over 80 papers in journals in the field of biomaterials and biotechnology, such as Biomaterials, Advanced Science, ACS Nano and Trends in Biotechnology. He would like to invite you to support his team in inventing sweet recipes for our sour body!

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

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