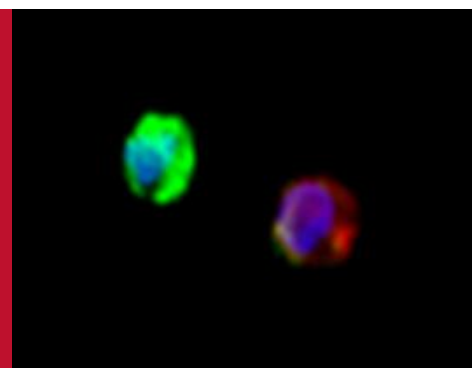


# Seminar: *Advanced Microfluidic Systems for Biomedical Research*



**School of Medical and Health Sciences Research Seminar Series**

**Date: Thursday 14<sup>th</sup> April 2016**

**Time: 11:00am-12:00 noon**

**Where: Building 19, room 143, ECU Joondalup campus**

**Guest Speaker: Dr Majid Ebrahimi Warkiani.** Lecturer in the School of Mechanical and Manufacturing Engineering, University of New South Wales (UNSW).

Microfluidics, a technology characterized by the engineered manipulation of fluids at the micro-scale, has shown considerable promise in point-of-care diagnostics and clinical research. Cell sorting is critical for many applications ranging from stem cell research to cancer therapy. Isolation and fractionation of cells using microfluidic platforms have been flourishing areas of development in recent years. The need for efficient and high-throughput cell enrichment, which is an essential preparatory step in many chemical and biological assays, has led to the recent development of numerous microscale separation techniques. Size-based passive particle filtration using *inertial microfluidics* have recently received great attention as a promising approach for particle focusing, filtration and fractionation due to its robustness and high rates of operation. The main advantage of inertial-based microfluidics approaches is that continues-flow separation without clogging can be realized using relatively large microchannels with extremely high resolution.

In this seminar, I will describe our recent efforts in development of ultra-high throughput microfluidics systems for separation of rare cells (e.g., circulating tumour cells (CTCs) and fetal cells) from blood. Further, I will show that how inertial microfluidics enables efficient sorting of Mesenchymal stem cells (MSCs) as a function of cell diameter, and show that this enables selection and sorting of osteoprogenitor cells from marrow for applications such as bone regeneration. Finally, I will present some of our efforts for large-scale manufacturing and enrichment of CHO and MSCs inside perfusion bioreactors for drug development and therapeutic applications.

**All welcome**

Please contact Dr. Carlos Aya-Bonilla ([c.ayabonilla@ecu.edu.au](mailto:c.ayabonilla@ecu.edu.au)) for further information.

