



## SMBE & IEEE EMBS Evening Lecture with Prof Simon Moulton, Swinburne University of Technology

### Interactive Materials in Biomedical Research

#### ABSTRACT

The term “bionics” is synonymous with the term “biomimetics” and in this context refers to the integration of human engineered devices to take advantage of functional mechanisms and structures resident in nature. The use of electrical conductors to transmit charge into and out of biological systems to affect biological processes has been the source of great scientific interest. This has inspired many to explore the possible use of electrical stimulation in promoting positive health outcomes. Advances in medical bionics technology are dependent upon eliciting precise control of the electrical energy to deliver beneficial health outcomes. The advent of polymer-based organic conductors now provides the platform for unprecedented possibilities by which the electrical energy can be used to modulate the function of medical devices.

Recent advances in the ability to manipulate and characterise materials have brought us closer to creating more effective bionic interfaces. The nature of that interface is dependent upon the chemical, physical, morphological and mechanical properties of the implant. Research being undertaken within the ARC Centre of Excellence for Electromaterials Science continues to develop a class of material, termed electromaterials that permits the on demand manipulation of the materials-biological interface. This presentation will showcase several research projects where stimuli-responsive electromaterials have been used to manipulate the cellular environment (nerve, muscle and stem cell) as well as provide a means to control the delivery of therapeutic agents (neurotrophins and anti-epilepsy drugs).

#### ABSTRACT

Prof Moulton obtained his PhD from the University of Wollongong (UoW) in December 2002. He then worked (Dec 2002 – Dec 2014) in numerous research positions within the Intelligent Polymer Research Institute (IPRI) and the ARC Centre of Excellence for Electromaterials where he progressed from junior postdoctoral Fellow to Associate Professor. In December 2014 he was recruited by Swinburne University of Technology (SUT) Melbourne to a strategic appointment of Professor of Biomedical Electromaterials Science. He also holds an Honorary Professor position within the ARC Centre of Excellence for Electromaterials Science (ACES) and Australian Institute of Innovative Materials (AIIM) at UoW. He is also a CI in the ARC Centre of Excellence for Electromaterials Science (ACES) where he contributes to work undertaken within the Synthetic Biosystems and Electrofluidics and Diagnostics programs.



#### EVENING LECTURE

**Venue: The Unicorn Club, Melbourne High School, Forrest Hill, South Yarra**

*(The Unicorn Club is next to the MHSOBA Scoreboard in the South-West Corner of the Melbourne High School grounds)*

**Time: 6:00 pm refreshments for 6:30pm start**

**Date: Tuesday, 21<sup>st</sup> June 2016**

**To register email:**

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All welcome

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