Biomedical Engineering Seminar Series

1st Semester, Academic Year 2015

Date: October 6, 2015
Time: 10.00-11.00 AM
Room R-114, 1st level, Building 1,
Department of Biomedical Engineering,
Faculty of Engineering;
Mahidol University

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"Interactive Materials in Biomedical Research"

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).

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