

The 288th MANA Special Seminar



Understanding and Tailoring the Biological-Material Interface

Chair: Dr. Guoping Chen (MANA PI)

Prof. Robert Short

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In this talk I will review some of the complications arising from the use of biomaterials in implantable devices and consider how, from a knowledge (of some) of the possible biological responses, more appropriate surfaces can be engineered at the molecular level to control and direct these events. In our laboratory (in conjunction with the MacNeil group, Univ. of Sheffield UK) we have developed technology based upon plasma polymerisation for engineering nanometre polymer films of defined chemistries. These have been developed for cell binding and release. They are being employed as coatings on bandages for the delivery of cells to wounds. Over the past decade they have been used in burns, scalds, diabetic wounds and leg ulcers.

In conjunction with the Day group (Oxford/Manchester Univ.) we have developed novel surfaces for the binding of complex sugars that may form the basis of a new generation of therapeutics. Using physical masks, and unique micron scale plasma sources (developed with Bradley's group at Liverpool and Eden's group, Univ. of Illinois, USA) we have developed new technologies for the spatial patterning of surface chemistry (and topography) and of biological "cues" at the micron-scale. These methods are being extended to create gradients of biological molecules over "biologically meaningful" scale lengths of a few ten of micrometers to about 0.5mm. Examples include directing neurite outgrowth; spatial patterning of different cell types to form pseudo-tissues in 2-D and control over stem cell differentiation into specific types of tissue.

Venue: Auditorium, 1F, WPI - MANA Bldg.

Namiki site

Date: October 5th, Friday Time: 10:30am-11:15am

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