

UCSD-KACST Center of Excellence in Nanomedicine presents

Friday, Mar. 23 at 1:00
Special Invited Seminar

@ 145 Telemedicine Building



“Surface Engineering of Renewable Composites Based on Nanocellulose”

Emily Cranston, Ph.D.

McMaster University, Hamilton, Ontario

Professor Cranston’s research aims to engineer biologically based materials to replace those from non-renewable resources. Her seminar will cover their work with nanocellulose, which is optically clear, naturally abundant, as strong as Kevlar or steel, inexpensive, biodegradable and non-toxic. The term “nanocellulose” refers to both nanocrystalline cellulose (NCC) and nanofibrillated cellulose (NFC), which are two colloidal forms of cellulose that can be thought of as cellulosic “rice” and “spaghetti,” respectively. Potential applications of these materials include pigments, optical coatings, sensors, high-strength biomedical devices (splints, casts, implants, scaffolds), gels, foams or more generally as a substitute for non-biodegradable thermoplastic composites. Various techniques of surface engineering characterization will be discussed, highlighting colloidal probe atomic force microscopy (CP-AFM) and buckling-based mechanical measurements for thin film analysis.

Emily Cranston was born in Halifax, Nova Scotia and received her Honors B.Sc degree (2001) in bio-organic chemistry from McGill University in Montreal. During her undergraduate studies she participated in research on natural and synthetic biodegradable polymers, helped establish the Canadian Green Chemistry and Engineering Network, and developed multimedia tools for teaching chemistry and physics. She did her Ph.D. with Derek Gray’s group at McGill University, exploring the use of nanocrystalline cellulose for model surfaces and in novel cellulose composites. The study of “value-added” products from cellulose took her to the Royal Institute of Technology (KTH) in Stockholm, Sweden (they also have a lot of trees!) where she worked in two departments: Surface and Corrosion Science (characterizing surface forces and adsorption phenomena) and Fibre and Polymer Technology (studying fundamental and mechanical properties of nanocellulose). In January 2011 she took the position of Assistant Professor in Chemical Engineering at McMaster University.