

A Seminar by NUS Nanoscience & Nanotechnology Initiative
***Polymeric biomaterials and fundamental research
on electrospun scaffolds***

Date : 29 July 2009 (Wednesday)

Time : 11.00am – 12.00nn

Venue : EA-06-03 Seminar room, Faculty of Engineering

Speaker: Dr Maria Letizia Focarete

Science & Technology of Polymeric Materials

Chemistry Department “G. Ciamician”

Faculty of Sciences, Bologna University, Italy

Email: marialetizia.focarete@unibo.it

Abstract

A deep knowledge of the dependence of material properties on polymer structure and morphology is the basic requirement for the design of polymeric biomaterials able to meet the increasing demand of the biomedical field.

The solid-state properties of interesting biodegradable macromolecular systems, both commercially available and ‘ad-hoc’ synthesized, will be discussed. In particular: (i) polymers synthesized by lipase catalysis; (ii) copolyesters synthesized through “reactive blending”; (iii) biopolymers such as bacterial (poly-hydroxyalcanoates); (iv) man-made polymers from bio-based monomers, i.e. poly(lactic acid) and lactide copolymers.

These polymeric systems can be processed by means of electrospinning technology in order to fabricate biomimetic micro-nanofibrous scaffolds with desired fiber morphology and fiber orientation. In particular, novel star-shaped micropatterned materials with tunable porosity can be obtained by using novel collector devices.

In view of tissue engineering applications, besides possessing suited chemical-physical-mechanical properties and a biomimetic structure, scaffolds should be characterized by a tunable bio-resorption rate. The *in vitro* hydrolytic degradation behaviour of electrospun poly(lactide-co-glycolide) mats will be presented together with a preliminary scaffold functionalization, by directly incorporating bio-molecules in the spinning solution during scaffold production.

About the Speaker

M.L. Focarete (M.Sc. Chemistry 1995, Ph.D. Industrial Chemistry 2000, University of Bologna, Italy) is Researcher of Science and Technology of Polymeric Materials at the Chemistry Dept., Faculty of Sciences of Bologna University. She is professor of the academic courses “Polymer Technology” and “Chemistry of Polymers with Exercises”. Her current research interests include fabrication of nanofibrous materials by electrospinning technology. A main research objective is the design and characterization of bioresorbable nanofibrous polymeric scaffolds for tissue engineering applications.

~~ All are welcome ~~