

# CHMI 4615 Seminar

## Development of Stable MPTMS and APTES Coatings on Mg AZ31 in SBF for the Purpose of Covalent Immobilization of RGD Peptides By Katherine Bissonette

Date: Monday, November 2nd, 2009

Time: 12:30 p.m.

Place: Room S-217

**Abstract:** Magnesium alloys have recently been proposed as biodegradable orthopedic implant materials due to their favourable physical and mechanical properties. Unfortunately, their high reactivity in aqueous environments results in hydrogen gas production and an increase in alkalinity upon degradation. This has prompted the search for more biocompatible materials with controlled degradation rates. Coated magnesium alloys are of interest for this purpose. Organosilane coatings are of particular interest because they have been shown to increase the corrosion resistance of metal substrates and they are available with a wide variety of functional groups at the end of their alkyl chain. An appropriate choice of functional group will allow us to "biofunctionalize" the magnesium implant surface by immobilization of bioactive molecules. This study will examine the stability of 3-mercaptopropyltrimethoxysilane (MPTMS) coatings and 3-aminopropyltriethoxysilane (APTES) coatings on Mg AZ31 alloys in simulated body fluid. A method for covalent immobilization of an RGD peptide to the organosilane modified surfaces will then be developed using N-succinimidyl-3-maleimido-propionate (SMP) as a spacer molecule. This peptide sequence has been shown to promote osteoblast adhesion to implant surfaces