

Purdue University

School of Materials Engineering MSE 690 Seminar Series Presents

Date: Monday,
September 23, 2013
Time: 3:30 Refreshments
3:45 Seminar
Place: ARMS 1010



**Infinite
Possibilities**

Adjunct Professor Aisling Coughlan
Kazuo Inamori School of Engineering
Alfred University
Alfred, New York

ABSTRACT

Glass Used in Medical Applications

Glass has been used in the medical industry since the 1400s, beginning with glass vessels used to store medicine. In the 1960's the first bioactive glass was developed for restoration and repair of damaged sites in bone tissue. Interest steadily grew in developing bioactive glasses for orthopedic applications as there is an almost limitless number of compositions that can be formulated. This work investigates the modification of, what is traditionally a dental material, glass polyalkenoate cements (GPCs), for use in orthopedics to eradicate the proliferation of harmful microbes such as *methicillin resistant S. aureus* (MRSA). This presentation will predominantly focus on research relating to antibacterial coatings based on GPC chemistry including the design of novel materials and properties related to surface coating in surgical theatres. Additionally, current work on problems associated with chemical degradation of pharmaceutical glass vials will be presented. There has recently been 6 product recalls of pharmaceutical glass due to delamination on the vial's interior surface, as the effect of particle degradation *in vivo* is relatively unknown. Thus the methods undertaken to investigate corrosion of pharmaceutical vials will be discussed with respect to the manufacturing process and the future commercial impact.

SHORT BIO

Aisling Coughlan obtained her B.Sc in Biomedical and Advanced Materials (2006) at the *School of Science and Engineering*, University of Limerick, Ireland, followed by a Ph.D (2009) in Biomedical Materials at the *Material and Surface Science Institute*, also located at the University of Limerick. Subsequently, she obtained a position at the *Inamori School of Engineering*, Alfred University, New York (2009-present) as a postdoctoral researcher in biomaterials and focuses her research on bioactive glass based materials. She also manages the BES laboratories. In January 2012, she was appointed *Adjunct Professor* at Alfred University. Currently Dr. Coughlan teaches *Introduction to Bioengineering* (Fall Semester) and *Skeletal Tissue* (Spring Semester) to junior and senior level undergraduate students in addition to biomaterials graduate students. Dr. Coughlan authored/contributed to 17 peer-reviewed journal publications and has presented at international conferences in Europe and the United States including the European Society of Biomaterials, the Society of Biomaterials and North Eastern Bioengineering Conference (NEBEC).