



**Chemical Engineering
Grain Processing Corporation
2011-12 Lecture Series**
presents

**Friday
February 24,
2012**

10:00 a.m.

**Chem. Sci.
& Engineering
Room 102**

**Refreshments
will be served**



Dr. Bruce P. Lee

**Michigan Tech
Department of
Biomedical Engineering**

Mussel-Inspired Adhesives and Coatings

Bioadhesives have a wide range of important applications in the biomedical field. Tissue adhesives simplify complex surgical procedures to achieve effective wound closure and surgical repair. Despite these important functions, currently available adhesives seldom meet the basic requirements for *in vivo* applications because of possible disease transmission, poor adhesive quality, or toxicity concerns. Thus, there is an ongoing need for the development of tissue adhesives with improved characteristics. Nature provides many outstanding examples of adhesive strategies from which chemists and materials scientists can draw inspiration in their pursuit of new biomaterials. Of particular interest is the mussel adhesive protein (MAP) secreted by marine mussels. MAP is initially secreted as a proteinaceous fluid, and then subsequently harden *in situ* to form an adhesive plaque, which allow mussels to bind tenaciously to various types of surfaces underwater. One of the unique structural features of MAP is the presence of L-3,4-dihydroxyphenylalanine (DOPA), an amino acid post-translationally modified from tyrosine, which is believed to fulfill the dual role as the adhesive moiety and the crosslinking precursor. My research had focused on the incorporation of DOPA and its derivatives in creating synthetic mimics of MAPs for various medical applications. In this seminar, I will discuss the design and application of these biomimetic adhesive materials.