Northeastern University
College *of* Engineering

Please join us for a
Special Chemical Engineering Seminar

Wednesday, January 30, 2013
108 West Village H
11:45 a.m. – 1:00 p.m.

"Synthetic Polymers as Injectable Scaffolds for Bone Tissue Engineering"

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ABSTRACT

Based on strong societal demand, tissue engineers have long sought to develop viable alternatives to the current clinical gold standard of autologous bone grafts for the treatment of large bony defects often resulting from traumatic injury, tumor resection, degenerative diseases, or congenital deformities. While there has been significant progress to date in the development of synthetic preformed scaffolds, many applications in tissue engineering may be better served by injectable, *in situ* forming and degradable hydrogel-based materials capable of delivering encapsulated cells in a non-toxic and minimally-invasive manner. Thermogelling polymers, which undergo a reversible phase transition and solidify upon injection into the body, are promising candidates as scaffold backbones. In particular, we have been working towards the development of a novel class of two-component, *in situ* dual-hardening hydrogels combining near-instantaneous temperature-induced gelation with chemical crosslinking, with a focus on targeted material properties to optimize swelling behavior, compressive and rheological mechanical properties, rate of biodegradation, component and system cytocompatibility, viability of encapsulated cells, and hydrogel mineralization *in vitro* and *in vivo*. Such *in situ* dual-hardening, dimensionally stable, defect-filling, and degradable hydrogels are attractive substrates for tissue engineering and cellular delivery applications.

BIOGRAPHY: Dr. Adam K. Ekenseair earned a B.S. summa cum laude in Chemical Engineering from the University of Arkansas in 2005, where he was a Chancellor's Scholar. He then went on to receive a Ph.D. in Chemical Engineering from the University of Texas at Austin in 2010 as both a National Science Foundation Fellow and a National Defense Science and Engineering Graduate Fellow working under the supervision of Nicholas A. Peppas in the area of non-Fickian penetrant transport dynamics in glassy polymers. In 2010, he began his postdoctoral training at Rice University with Antonios G. Mikos developing injectable, *in situ* forming hydrogels for the regeneration of craniofacial bone defects.

Refreshments will be served.