Chemistry 501 Seminar

Thursday, February 16, 2012
3:45 p.m. Buehler 415
Seminar not webcast
Refreshments in Buehler 412 at 3:30 p.m.

UMASS AMHERST

Dr. Gregory Tew

Polymer Science and Engineering
University of Massachusetts Amherst
Hosted by Dr. Bin Zhao

"Chemically Rich Macromolecules: Teaching Polymers How to Act Like Proteins"

Biography

Gregory N. Tew received a B.S. in Chemistry from North Carolina State University in 1995 and performed undergraduate research with Prof. D. A. Shultz. In 2000, he earned his Ph.D. from the University of Illinois-Urbana under Samuel Stupp after which he joined the Faculty at the Polymer Science and Engineering Department at the University of Massachusetts, Amherst. Before starting there, he spent one year in William DeGrado's laboratory at the University of Pennsylvania Medical School. Current research interests include bioinspired and biomimetic macromolecules, supramolecular polymer science, molecular self organization, and the mechanical properties of novel hydrogels. Synthetic mimics of antimicrobial peptides (SMAMPs) and protein transduction domain mimics (PDTMs) represent a large fraction of Greg's interest in novel oligomers and polymers that interact in specific ways with the biological plasma membrane. This work has lead to awards from the National Science Foundation (CAREER), the Office of Naval Research, the Army Research Office, 3M, DuPont and the Presidential Early Career Award for Scientists and Engineers. Most recently, he was elected as a member of the Defense Science Study Group and founding member of the ACS Polymer Chemistry Division Fellows program.

Abstract

We are interested in elucidating the rules required to create biomimetics with structure and function rivaling proteins. While scientists have been interesting in polymers for almost 100 years, compared to their biology cousins including proteins and DNA, these molecules remain relatively unsophisticated. Our laboratory has focused on creating novel polymeric molecules with increased functionality in order to enable new properties and applications. In this lecture we will discuss our efforts to design and synthesize macromolecules that are membrane-active including host defense, or antimicrobial, peptide mimics. These novel mimics have potent antimicrobial activity. We will also discuss more recent work on protein transduction domain, or cell penetrating peptide, mimics. These novel mimics allow delivery to immune cells which has previously been impossible. In addition, they enable fundamental studies between macromolecules and the plasma membrane.

Website: http://www.pse.umass.edu/gtew/index.html