Macromolecules Innovation Institute (MII) Seminar Series

VirginiaTech
Invent the Future

Prof. Jon Pokorski

"Polymer Engineering with Proteins: New Chemistry and Processing Techniques"

Case Western Reserve University
Department of Macromolecular Science and Engineering

Host: John Matson

Abstract: Two projects in the Pokorski lab will be described, detailing work ranging from the macro-scale to the molecular scale: (1) ROMP modification of proteins and (2) new processing methods to fabricate biomaterials. (1) Biopharmaceuticals are the main growth area of US R&D in pharmaceutical companies. For effective treatment, often times, a hydrophilic polymer is conjugated to the protein surface. For 40 years, the state of the art has been 'PEGylation' the so-called direct attachment of a poly(ethylene glycol) chain to a protein surface. This leads to enhanced circulation lifetime and prolonged activity. The Pokorski lab has developed methods using ring-opening metathesis polymerization (ROMP) to conjugate water-soluble polynorbornenes to proteins. Synthesis and complementary structural studies will be described. (2) The latter half of the talk will detail methods to incorporate peptides and proteins into bulk materials either through traditional polymer melt-processing or through chemical modification schemes. Both methods have the advantage of fabricating high-value biomaterials through relatively inexpensive and high-throughput processing.

Bio: Professor Pokorski began his scientific career by earning his B.S. in Biochemistry from UCLA in 2002. While at UCLA, he worked in private industry designing and developing biomedical devices. In 2007, Dr. Pokorski received his doctoral degree in organic chemistry from Northwestern University, where he designed, synthesized, and tested diverse peptidomimetic systems for use in medical diagnostics and therapeutics. Dr. then moved to The Scripps Research Institute, where he used both chemical and genetic engineering of viral nanoparticles to synthesize novel drug delivery systems. During postdoctoral training, Dr. Pokorski first earned an NIH Ruth Kirschstein fellowship (F32) and later secured an NIH Pathway to Independence Award (K99/R00). As an independent investigator, Dr. Pokorski's lab works to bridge chemical synthesis, molecular biology, and materials science to make new materials for biomedical applications. Research in the Pokorski lab is funded through grants from the National Institutes of Health, National Science Foundation, and the American Chemical Society (ACS PRF New Investigator Award).

Case Western Reserve University
Department of Macromolecular Science And Engineering
Center for Layered Polymeric Systems (CLiPS)
2100 Adelbert Rd., Cleveland, OH 44106
Office: 538 Kent Hale Smith Building;
Phone: (216) 368-6373
E-mail: jon.pokorski@case.edu

Sponsored by the Macromolecules Innovation Institute

DATE: APRIL 13, 2016
TIME: 11:15 AM – 12:15 PM
LOCATION: 310 KELLY HALL