



Northeastern University

College of Engineering

Special Seminar

“Hierarchical Polymer Hybrids”

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(Host: Prof. Shashi Murthy)



ABSTRACT

High performance materials found in nature, such as collagen and spider silk, exhibit a hierarchical structural arrangement and contain reinforcing, ordered domains, which lead to novel mechanical function. We will examine a bio-inspired approach, particularly the incorporation of ordered regions, to generate functional, polymeric hybrids with tunable mechanical properties. Multi-block copolymers, which mimic the microstructure of numerous natural materials, are ideal systems with which to explore ‘soft’ domain ordering via variations in secondary structure of polypeptide-based block copolymers. First-generation peptide-containing polymeric hybrids with controlled structural variations have been developed to elucidate the role of hierarchical ordering (secondary structure; microphase segregation; supramolecular interactions; crystallinity) and structural interplay on mechanical and morphological behavior. The fundamental structure-function relationships obtained in this examination of hierarchically-assembled hybrids will drive the development of new polymeric material systems with tailored mechanical behavior for emerging applications, such as scratch-resistant coatings, impact-resistant films/fibers for composites, and multi-functional tissue engineering scaffolds.

BIOGRAPHY

LaShanda Korley is the Nord Distinguished Assistant Professor in the Department of Macromolecular Science and Engineering at Case Western Reserve University. She received her Ph.D. in Chemical Engineering from MIT in 2005 and entered the Case Western faculty in 2007 following postdoctoral training at Cornell University. She is the recipient of CAREER (2010) and BRIGE (2008) awards from the National Science Foundation. In 2011, she was selected as one of eighteen DuPont Young Professors.
