

INORGANIC CHEMISTRY SEMINAR



Prof. Jonathan C. Barnes

Department of Chemistry, Washington University in St. Louis

“Supramolecular Polymers and Crosslinkers to Control Structure, Properties, and Performance in Polymer Networks and Nanomaterials”

Abstract: Nature’s biological machinery relies on precise non-covalent interactions that are pre-programmed into the individual monomers and primary sequence of biomacromolecules. These intricate designs allow for control over secondary and tertiary structure, as well as critical molecular recognition events that are responsible for regulating a wide range of physiological processes. Chemists have adopted many of Nature’s design parameters to synthesize functional materials that can respond and adapt to their environment and be applied in areas ranging from stimuli-responsive and self-healing materials to bionanotechnology platforms that are used for imaging and cancer treatment for example. The Barnes laboratory at Washington University is specifically interested in designing and developing supramolecular polymer-based materials using non-natural building blocks which operate through orthogonal modes of recognition to create macro- and nano-scale materials with precise functions. In my talk, I will discuss (1) the synthesis of novel redox- and photo-responsive polymers and soft materials for applications in hydrogel actuators, visible-light photoredox patterning, and 3D/4D cell culture, (2) our journey into the impact the mechanical bond has on materials comprised of mechanically interlocked polymers and crosslinkers, and lastly (3) our efforts to rationally design and self-assemble highly functional block copolymers into nanoparticles for applications in combination antimicrobial delivery.

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UCLA College | Physical Sciences
Chemistry & Biochemistry

More information: jzabala@chem.ucla.edu

4:00 p.m. | Via Zoom