

INORGANIC SEMINAR



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Heavy Elements in Nature: From Waste Management to Precision Medicine

From potential contamination of individuals with radioactive fission products after a nuclear accident to the therapeutic use of radioisotopes for cancer diagnostics and treatment, the nuclear, coordination and biological chemistry of actinides have become increasingly relevant to a number of applied problems. Understanding the fundamental bonding interactions of selective metal assemblies presents a rich set of scientific challenges and is critical to the characterization of *f*-element coordination chemistry, and to the development of highly efficient separation reagents or new therapeutic agents. Our approach to these challenges uses a combination of biochemical and spectroscopic studies on both *in vitro* and *in vivo* systems to characterize and tune the selective binding of man-made, *f*-block metal ions by natural and biomimetic ligand architectures. These studies will be discussed with a focus on emerging applications in separation, isotope production, and medicine.