Toward Sequestration and Separation of Critical Elements Using *De Novo* Designed Proteins

Rare earth elements are critical for the implementation of clean energies. However, the sequestration and purification of these compounds has been a major challenge. I my talk, I will describe my efforts toward the development of a protein-based separation system, which shall surpass the incumbent environmentally hazardous and energy-demanding processes. The latest machine learning technology for computational protein design is coupled with the development of high-throughput screening methods to design and downselect *de novo* proteins, which will be integrated in novel materials with high longevity and separation efficiency.