

Special Inorganic Chemistry **Seminar**

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“Elucidation of Reactive Species and Biological Processes Enabled by Molecular Design”

Abstract: Synthetic design can be leveraged as a powerful tool to address questions in spectroscopy, the materials sciences and biology. This presentation will discuss several platforms which, assisted by molecular design, facilitate the construction of new molecules, manipulate the inorganic-biological interface, and interrogate fundamental biological processes. Incorporation of main-group elements and molecules in functional compounds and materials is a challenge due to the propensity for the involvement of reactive intermediates and limitations in the synthetic tools available at the chemist's disposal. Herein, a strategy of masking reactive molecules by anchoring to a stable precursor is employed to controllably construct new molecules and materials, and enable the spectroscopic analysis of short-lived intermediates. Separately, synthetic manipulation of silicon nanowire arrays and the lipopolysaccharide transport system of Gram-negative bacteria has enabled the spectroscopic exploration of the “wiring” between cells and inorganic nanostructures. Ultimately, this work aims to elucidate fundamental biological processes and lay the groundwork for molecular-nanoscale circuits to optically and electronically control cellular processes.

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