

Departmental Seminar
Thursday September 25, at 9:30 AM
MacN 101

Prof. Adam Damry

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Title: "Proteins on the edge: Harnessing biochemistry at heterogeneous interfaces"

Abstract: Modern industrial enzymes are typically heavily engineered to improve and diversify their properties. Given the staggering number of possible protein sequences, this engineering process is generally guided by known structural and functional information. This information is typically obtained using standard structural biology techniques such as X-ray crystallography and nuclear magnetic resonance spectroscopy. These characterization techniques are however poorly suited to the study of enzymes that interact with solids. As a result, designing and engineering such proteins is difficult despite their incredible potential in both bioremediation efforts to combat environmental pollution and applications in the multitrillion-dollar materials and medical industries. In this talk, I will discuss our work in understanding protein-solid interactions and using this information to create novel biosystems that function in this interface. These include both applied systems, where we are using and sanitizing novel oxidoreductases to create low-cost chip-based sensors for environmental pollutants, as well as fundamental systems, where we are working to understand the catalytic determinants of plastic-degrading enzyme activity. Along the way, we have built tools and workflows to study proteins and their interactions in this hard-to-observe environment. These mechanistic and methodological studies will feed back into a cycle of designing, building, and testing novel enzymes, enabling us to progressively deepen our understanding of these difficult-to-study systems and interactions. Ultimately, they will enable the design of complex biocatalysts with tangible medical, industrial and environmental applications.

Coffee & Timbits will be served at 9:15 AM