



## Department of Chemistry Seminar Series Fall 2022

Friday, September 23, 2022, 3:30 PM - HS1 O112 (Health Sciences)

Host: Jonathan Caranto

### Redox metalloenzymes through an electrochemical lens: a story of CO<sub>2</sub> reduction



**Prof. Sean Elliott**

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This seminar will use iron-sulfur cluster proteins and enzymes as examples to illustrate how a far-ranging series of redox-active metalloproteins can be examined through an electrochemical lens, to understand the role that specific redox couples play in complex enzymatic mechanisms and biological pathways. The main focus will be the impact and interplay of ferredoxin—small, ubiquitous iron-sulfur cluster redox relays—upon the function of members of the oxo-acid:ferredoxin oxidoreductase (OFOR) enzyme superfamily will be discussed. OFORs are essential players in the carbon cycle, and are considered to be reversible enzymes. However, like hydrogenases and other reversible enzymes, the design features that nature has employed to modulate the ‘bias’ of reactive toward either oxidation or reduction is unclear. And, like hydrogenases, understanding the redox couples of OFORs has proven challenging historically. Here, a combination of electrochemical and spectroscopic studies will be presented as a series of OFOR enzymes from varying biological sources and pathways will be compared and contrasted.