



**Chemistry & Biochemistry  
Department Presents:  
Dow Corning Assistant Professor  
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**November 11<sup>th</sup> at 2:30 pm, 350 French Hall**

**Title: Modeling the Active of Bacterial Nitric Oxide Reductase**

**Abstract:**

Bacterial nitric oxide reductase (NorBC) is an enzyme found in soil dwelling bacteria that is responsible for the conversion of nitric oxide (NO) to nitrous oxide (N<sub>2</sub>O) via a two-electron reduction:



This enzyme fulfills a vital role in the process of denitrification where nitrate is reduced in a stepwise fashion to dinitrogen. The site of catalytic NO reduction within the enzyme consists of a dinuclear iron center with both heme and non-heme type coordination. The non-heme iron site has three histidine ligands and has been proposed to also contain glutamate ligation. Located 3.5 Å from the non-heme iron is a heme b site with additional proximal histidine ligation similar to that seen in the heme active sites of Hb and Mb. In my presentation, I will first address the question how five- versus six-coordinate ferrous heme-nitrosyls differ in their electronic structures, and how this could relate to the proposed mechanism of NorBC. I will then summarize our ongoing efforts in modeling both the heme and non-heme iron component of the enzyme's active site.