

# The R. Gaurth Hansen Seminar Series



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Hosted By: Dr. Joan Hevel

*WHEN:* Wednesday, October 24, 2018

*WHERE:* Eccles Science Learning Center  
Rm 046

*TIME:* 4:00pm

## **Nitric Oxide in Biology: From Prokaryotes to Humans**

The discovery of nitric oxide (NO) function in biology was a surprise, given the toxicity of the molecule. The principal discoveries emerged from two disparate fields of investigation, one focused on blood vessel dilation and the other on immune system function. Since the discovery, it has become clear that this toxic, free radical, diatomic gas plays an important role in cellular function in both prokaryotes and eukaryotes. NO acts as a signaling agent in the cardiovascular system and other tissues. Using a low concentration of NO mitigates the toxicity problem but places a difficult chemical requirement on the NO receptor, the soluble isoform of guanylate cyclase (sGC). sGC contains a heme cofactor that binds and traps NO, thereby activating the enzyme to convert GTP to cGMP. The heme in sGC has unique ligand binding properties enabling sGC to act as a selective receptor for NO. The heme domain of sGC was found to be part of the H-NOX (Heme-Nitric oxide/OXygen) family of proteins with homologues in both aerobic and anaerobic prokaryotes. Studies with H-NOX proteins has provided a molecular explanation for selective NO trapping at low concentrations. The structure/function picture that is emerging provides new clues to the activation mechanism. As a physiological model is developed it must also account for activity properties of stimulators such as the FDA-approved Adempas®.

Please visit [chem.usu.edu](http://chem.usu.edu) for more info on  
Seminar Series and to see Dr. Marletta's Bio.



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