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# Characterization of the Gas-Sensing Protein CooA

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Department: Chemistry

Faculty Sponsor: Robert Clark

Title: *Characterization of the Gas-Sensing Protein CooA*

Abstract:

This research aims to characterize the binding specificity of heme proteins to various gas signal molecules. Heme proteins in the gas-sensing family bind to specific gas signal molecules, causing a certain biological function to be activated or deactivated. In this study, variants of the carbon monoxide sensing heme protein CooA from the bacteria *R.rubrum* and *C. hydrogenoformans* are compared. Key differences in signal binding specificity and heme environment configuration will be investigated. This is done by using site-directed mutagenesis to alter the heme environment, isolating the CooA proteins through protein purification, and analyzing the isolated products through DNA binding assays. By manipulating the heme environment of these variants of CooA and comparing the signal binding specificity and activation to each other and the wild type proteins, the basis of how CooA proteins are specifically activated by carbon monoxide is further explored.

About the Authors:

Teryn Gehred is a senior Chemistry and Biology double-major from Delafield, WI. She plans to attend a graduate school PhD program in biomedical science. She has been studying heme proteins with Dr. Clark since 2011 and will continue to do so throughout the school year. Jessica Lyza is a junior Chemistry and Criminology double-major from Schererville, IN. She plans to attend graduate school for forensic chemistry studies. She began working on this project with Dr. Clark in the summer of 2013 and will continue to do so throughout the school year.

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