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Functionality of FNR Proteins with Mutations in the FE-S Binding Domain

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Poster Presentation P28

**FUNCTIONALITY OF FNR PROTEINS WITH MUTATIONS IN THE FE-S
BINDING DOMAIN**

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The FNR protein is an oxygen sensing transcription factor found in *Escherichia coli*. The binding of wildtype FNR to DNA is facilitated by the presence of a 4Fe-4S cluster, which functions to dimerize the protein. Entry of oxygen into the cell destroys the 4Fe-4S cluster and causes a conformational change in the protein, which then impedes dimerization. It is not understood how or why oxygen destroys the 4Fe-4S cluster. However, it is known that a leucine to histidine mutation at position 28 retains a stable 4Fe-4S cluster in the presence of oxygen. The properties of the amino acid residues (charge, size) surrounding the Fe-S cluster are important when considering its stability. The four cysteine amino acids found at positions 20, 23, 29 and 122 in the coding sequence of FNR ligand the four iron molecules in the cluster. We have investigated the importance of particular residues near these cysteine ligands. Our anaerobic cultures show decreased activity of FNR in alanine and aspartate mutants compared to histidine and lysine mutants at position 28. Aerobic studies are currently being conducted.