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The Role of the Hinge Region in the Activity of the Protein FNR in E. Coli

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Poster Presentation P41

**THE ROLE OF THE HINGE REGION IN THE ACTIVITY OF
THE PROTEIN FNR IN E. COLI**

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FNR is an oxygen-sensing transcription factor in the facultative anaerobic bacteria *E. coli*. It is part of a family of proteins that includes cAMP receptor proteins (CRP or CAP). These proteins undergo conformational changes in response to specific effector molecules, which in the case of FNR is oxygen. In its functional form, two subunits of the FNR protein form a homodimer through a α -helix, residues 140 to 160. Adjacent to this helix is a "hinge" or "switch" region at residues 161 to 171, far from the oxygen-sensing domain of the protein. In homologues to FNR, CAP and CooA, it has been shown that this region plays a role in stabilizing the conformational changes involved in the activation process. Residues 161, 169, 170, and 171 in particular are highly conserved in the CRP family. The goal of this project is to study the importance of this switch region in the activity of FNR. Site-directed mutagenesis and β -galactosidase activity assays were performed to investigate the role of the hinge region in FNR, and they have shown that this region may have less involvement in the activation process than its homologues. Future work will involve reversing the charges of several residues of the hinge region, and analyzing how such a change affects the activity of FNR..