

Abstract Submitted  
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**Unlocking the molecular mechanisms of *E. coli* MutS** ASHTYN BELL, JULIE GUNDERSON, Hendrix College — The DNA mismatch repair pathway is a system of proteins that corrects mistakes that occur during DNA replication. In *E. coli*, MutS initiates DNA mismatch repair via binding to DNA mismatches. Once bound, MutS uses ATPase activities to signal for other repair proteins to excise and correct the mismatch. MutS has been shown to have a higher binding affinity to G-T, A-C, G-G, and A-A mismatches when compared to other mismatches, C-T, A-G, T-T, and C-C, which bind at a lower affinity. Spectrophotometric ATPase assays were used to measure the ATPase activity of MutS in the presence of all DNA mismatches. From spectrophotometric ATPase assay data, a  $K_{cat}$  value can be found that describes ATP reactions with MutS. Fluorescence anisotropy was used to test the binding activity of MutS by the discovery of a  $K_d$  value, which is the measure of the protein's binding affinity. Details like ATPase activity and binding affinity are important to understanding DNA mismatch recognition on a molecular level. Because the DNA mismatch repair system is conserved throughout nature, the DNA mismatch repair pathway of *E. coli* serves as a prototype for understanding DNA mismatch repair in humans.

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