Characterization of *Taq UvrD Helicase Activity*

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Living cells are continuously exposed to DNA damaging processes and agents which when left unmediated can lead to a myriad of adverse health implications. The highly evolutionarily conserved pathway of DNA mismatch repair (MMR) plays a key role in the maintenance of genomic stability and integrity. This project aims to express and characterize the *Taq UvrD* protein of the model organism *Thermus aquaticus*, as this presents a hybrid system between the *E. coli* and eukaryotic MMR. *Taq UvrD* protein will be expressed in *E. coli* cells via autoinduction and, after purification with affinity chromatography and intein cleavage, will be subjected to helicase and ATPase assays to assess protein activity. Homology modeling studies will be conducted as well to determine structural and binding differences between the *UvrD* proteins of the two homologous species *T. aquaticus* and *E. coli*. This is because such differences may imply the role of helicases in eukaryotic MMR.