Defective mismatch repair (MMR) is responsible for 80% of hereditary non-polyposis colorectal cancers. Therefore, understanding these pathways is critical to better understanding these cancers and developing more targeted therapies. However, not much is known about the mechanism and functions of eukaryotic MMR proteins. Thermus aquaticus (T. aquaticus) shares similarities with both E. coli and eukaryotic MMR pathways and offers more stable MMR proteins that can be more easily characterized in vitro than those of eukaryotes. UvrD helicase is a critical MMR protein in T. aquaticus and E. coli that unwinds mutated DNA strands and aids in nucleotide excision repair. T. aquaticus UvrD was expressed in an E. coli system and purified for helicase activity characterization. Taq UvrD’s helicase activity was confirmed through helicase and ATPase assays and was shown to increase with ATP concentration in the physiologically relevant range. However, the enzyme kinetics of Taq UvrD still require further investigation. The insight gained from this project can be used to guide future research into the roles of helicases in the eukaryotic MMR pathway.