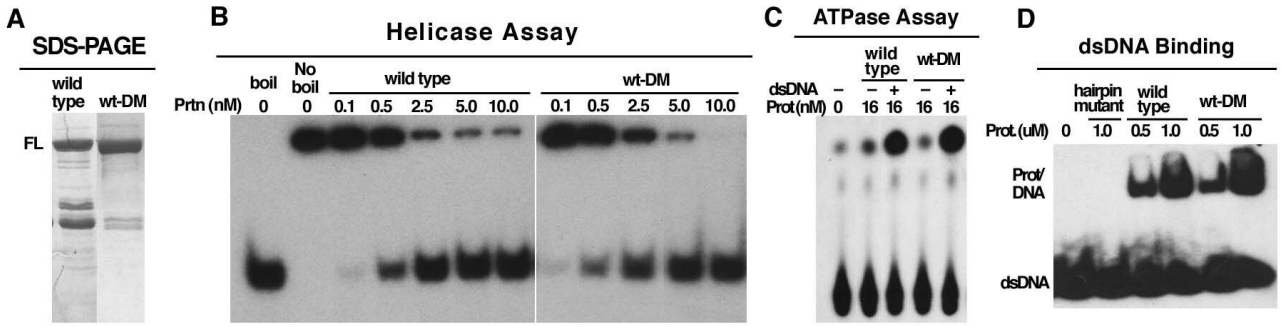
Supplementary Information



SI-Figure 1. Comparison of the wt mtMCM and the double mutant (DM, R275A/R338A) on the full length mtMCM (labeled as wt-DM) used for the mutagenesis study reported in the paper. **(A).** SDS-PAGE analysis of purified wt and the wt-DM protein. Two degradation bands were present for wt, but were essentially absent in the wt-DM. While the wt mtMCM tends to degrade over time in room temperature, wt-DM is stable for at least one week. **(B).** Helicase assays of the wt and wt-DM proteins, each at five different concentrations, showing very similar unwinding activity for both proteins. The slightly higher helicase activity of the wt-DM may be partially explained by the reduced degradation of the protein. **(C).** ATPase assay of the wt and wt-DM proteins, showing similar level of stimulation of ATP hydrolysis by dsDNA. **(D).** The dsDNA binding of the wt and wt-DM protein. The beta hairpin-mutant (R226A/K228A) that showed no detectable dsDNA binding was used as a negative control. This binding results show that the two versions of the protein displayed similar level of DNA binding.