

**P061** Archaeal family B DNA polymerase stalling, protection and interaction with PCNA at deaminated bases

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*Pyrococcus furiosus* is a hyperthermophilic archaeon. At these elevated temperatures cytosine deamination to uracil is one of the most common mutations. Adenine can also be hydrolytically deaminated to hypoxanthine. This occurs at a lower rate than cytosine deamination, but still poses a problem for genomic integrity. One novel DNA repair pathway specific to the archaea is the recognition of deaminated bases by DNA polymerases. On encountering these bases replication is halted. Stalling is achieved by the deaminated bases (uracil and hypoxanthine) binding into a specialised pocket at the N-terminus of the polymerase.

In this study biophysical techniques were used to observe the pre-steady state kinetics of the polymerase, enabling us to directly monitor the various steps and intermediates during the course of a reaction between the polymerase and primer-template substrates. The presence of PCNA increased the polymerases affinity for the primer template and primer extension processivity, although the PCNA did not effect the stalled polymerase. The stalled polymerase was found to protect uracil from UDGase and EndoV attack with significantly increased protection when PCNA is present. These data illustrates the importance of stalling *in vivo*, in protecting deaminated bases in single strand DNA from attack during replication and possibly marking the damaged DNA for repair.