

**P023** Archaeal replicative DNA polymerases: importance of consensus motifs to bind functionally to processivity factor **Benoît CASTREC<sup>1</sup>, Christophe ROUILLON<sup>1,\*</sup>, Ghislaine HENNEKE<sup>1</sup>, Didier FLAMENT<sup>1</sup>, Joël QUERELLOU<sup>1</sup> and Jean-Paul RAFFIN<sup>1</sup>**

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The processivity of DNA polymerases is increased by proliferating cell nuclear antigen (PCNA), one of the most crucial players to the replication fork. Replicative DNA polymerases display a conserved canonical PCNA-binding motif (the PIP box) at their C-terminus. We investigated the role of this motif on the functional interactions of the two DNA polymerases, family B *PabPol B* and family D *PabPol D*, from the hyperthermophilic euryarchaeon *Pyrococcus abyssi*, with the cognate PCNA. Surface plasmon resonance and primer-extension studies clearly showed that the PIP box was essential for interactions of *PabPol B* with the PCNA, but that *PabPol D* interacts with its processivity factor by another motif. In the aim to reveal it, a glycine-rich motif can be found in all euryarchaeal family D and most crenarchaeal family B DNA polymerases. This motif that we redefine as the PYF box is known to mediate the binding of DNA polymerase  $\delta$  to PCNA. But, similarly, surface plasmon resonance and primer-extension studies showed that the PYF box was dispensable for interactions of *PabPol D* with the PCNA. Finally, we propose, that similar to eukaryotes, the crenarchaeotes and euryarchaeotes use a two replicase mechanism at the replication fork.