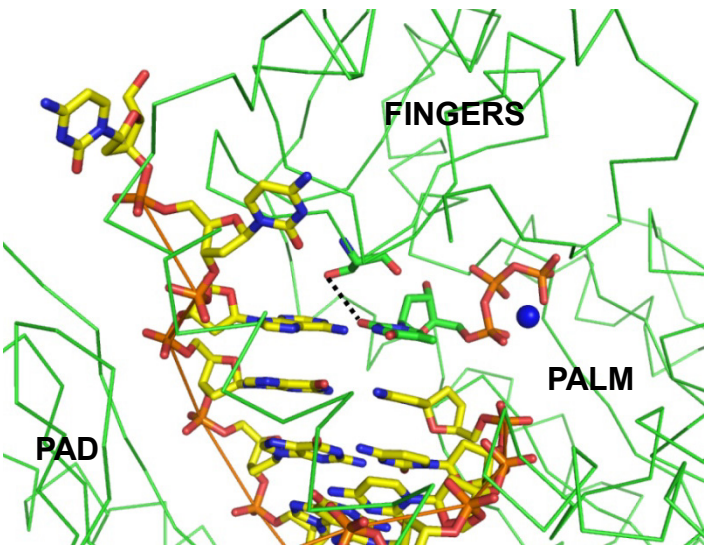


Supplementary Figure Legends

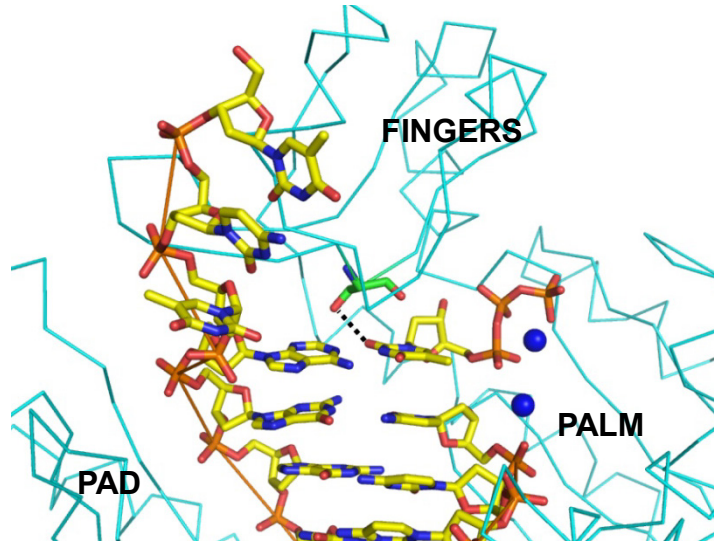
1. Sequence alignment of PolIV orthologs. The alignment shows that the Ser42 residue is conserved in close PolIV orthologs from different prokaryotes. However, in the archaeal homologs ssDpo4 (*Sulfolobus solfataricus*) and Dbh (*Sulfolobus acidocaldarius*) the residue at this position is Ala.
2. Polk_{dA:dTTP} and PolIV_{dA:dTMPnPP}. The close up of the active sites of the ternary complexes of Polk and PolIV are displayed. The protein backbone and DNA are displayed in ribbon and stick representation, respectively. The equivalent residues Ser42 (PolIV) and S137 (Polk) are displayed in stick representation and the hydrogen bond formed with O2 of the thymine base of incoming nucleotide is shown in the form of dotted lines.
3. A:C base pair in the PolIV active site. (A) Simulated annealed omit (Fo-Fc) map for the dA:dCTP base pair. The map is displayed at a contour value of 3.0. (B) The active site residues lining the dA:dCTP base pair are displayed.

*

<i>E. coli</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRERR---GVI STANY PARKFG
<i>P. vagans</i>	-----MRKIIHVDMDCFYAAVEMRDNPQLRDIPIAIGGSRERR---GVI STANY PARKFG
<i>E. billingiae</i>	-----MRKIIHVDMDCFFAAVEMRDDPSLRDIPIAIGGSHLKR---GVI STANY PARKFG
<i>S. sonnei</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRERR---GVI STANY PARKFG
<i>C. rodentium</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRERR---GVI STANY PARKFG
<i>S. enterica</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRERR---GVI STANY PARQFG
<i>Y. regensbergi</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRVQR---GVI STANY PARKFG
<i>E. mori</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPIAIGGSRVQR---GVI STANY PARKFG
<i>K. pneumoniae</i>	-----MRKIIHVDMDCFFAAVEMRDNPALRDIPLAIGGSRVQR---GVI STANY PARKFG
<i>C. sakazakii</i>	MRGVAMRKIIHVDMDCFFAAVEMRDNPALRDIPLAIGGSRERR---GVI STANY PARKYG
<i>R. aquaticus</i>	-----MRKIIHVDMDCFFAAVEMRDDPSLRDIPIAIGGSRDRR---GVI STANY PARKFG
ssDpo4	-----MIVLFVDFDYFFAQVEEVLNPSLKGKPVVVCVFSGRFEDSGAVATANYEARKFG
DbH	-----MIVIFVDFDYFFAQVEEVLNPQYKKGKPLVVCVYSGRTKTS GAVATANYEARKLG

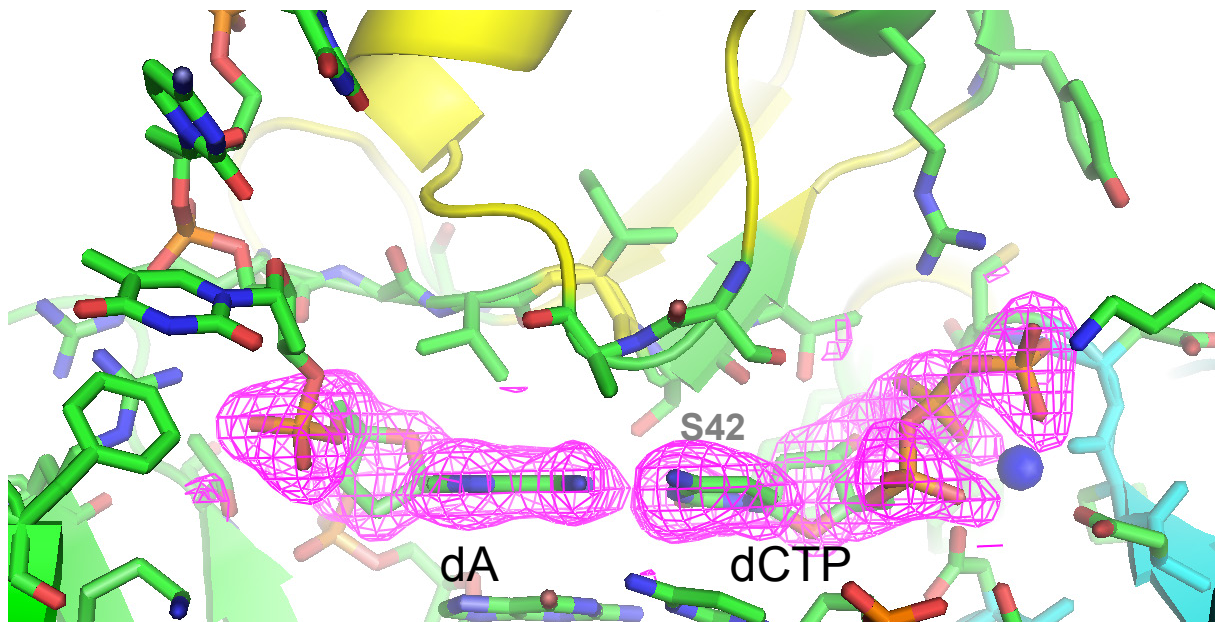


PolK_{dA:dTTP}



PolIV_{dA:dTMPnPP}

A.



B.

