

## DNA polymerase kappa, functional

### BACKGROUND

Mammalian **DNA polymerase k**, a member of the UmuC/DinB nucleotidyl transferase superfamily, has been implicated in spontaneous mutagenesis (1). **Human DNA polymerase k** copies undamaged DNA with average single-base substitution and deletion error rates of  $7 \times 10^{-3}$  and  $2 \times 10^{-3}$ , respectively. These error rates are high when compared to those of most other DNA polymerases (2). **DNA polymerase k** has important role in the mutagenic bypass of certain types of DNA lesions (3).

This product was over-expressed as a recombinant protein in *E. coli* with a plasmid carrying a C-terminal histidine-tagged human **DNA polymerase k** (1-560 aa), and highly purified by several steps of chromatography (2). The product is catalytically active and its molecular weight is 65 kD (Fig 1). Activity of this product has been confirmed by a user researcher even if it was diluted 8,000-fold.

### Application

- 1) Functional studies on translesion DNA synthesis by DNA polymerase kappa
- 2) Antigen for western blotting and ELISA by anti-Pol kappa antibody

**Purity:** Over 90% by SDS-PAGE (CBB staining)

**Protein concentration:** 3.2 mg/ml as measured by BCA method

**Form:** 0.2 M NaCl, 10 mM sodium phosphate buffer (pH 7.0), 50% glycerol

**Size:** 50 ug

**Storage:** Sent at 4°C or at -20°C. Upon arrival, centrifuge briefly and store at -20°C or at -80°C for longer storage.

**Data Link:** UniProt KB/Swiss-Prot [Q9UBT6](#) (POLK\_HUMAN)

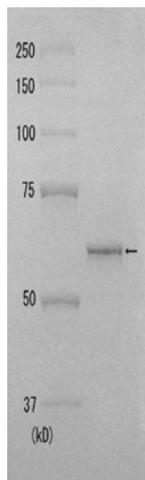
**References:** This product has been used in the following publications

1. Ohashi E et al (2000) Fidelity and processivity of DNA synthesis by DNA polymerase kappa, the product of the human DINB1 gene. *J Biol Chem* **275**: 39678-39684 (2000) PMID: [11006276](#)
2. Ohashi E et al (2000) Error-prone bypass of certain DNA lesions by the human DNA polymerase kappa" *Genes Dev* **14**: 1589-1594 (2000) PMID: [10887153](#)
3. Jąłoszyński P. et al (2005) Error-prone and inefficient replication across 8-hydroxyguanine (8-oxoguanine) in human and mouse ras gene. *Genes Cells* **10**:543-50. PMID: [15938713](#)



13 25 50  
pol κ C

**Fig. 1. DNA polymerizing activity of Pol kappa (1-560 aa):**  
50 mM Tris-HCl (pH 8.0), 2 mM MgCl<sub>2</sub>, 1 mM DTT, 0.1 mg/ml BSA, 0.1 mM dNTP, 100 nM primer/template (13-mer/30-mer)  
DNA polymerase k 13 - 50 ng/25 ul assay, at 37°C, 10 min.



**Fig.2 polyacrylamide gel electrophoresis of DNA polymerase k protein**

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