



## PCNA (human), functional

### BACKGROUND

**PCNA (Proliferating cell nuclear antigen)** is a homotrimeric protein (261 aa; 29 kDa) known to act as a co-factor for DNA polymerase  $\delta$ , which is responsible for leading strand DNA replication. **PCNA** was originally identified as an antigen that is expressed in the nuclei of cells during the DNA synthesis phase of the cell cycle. Crystal structure data suggests that a **PCNA** homotrimer ring encircles and slides along the DNA double helix. Multiple proteins involved in DNA replication, DNA repair, and cell cycle control bind to **PCNA** rather than directly associates with DNA, thus facilitating rapid processing of DNA. **PCNA** is a useful marker for DNA synthesis and some cancers. It is highly conserved among most animals.

### Applications confirmed:

1. Functional studies on DNA replication, recombination and repair. (Ref 2, 3, 5, 6, 7, 8, 9, 10).
2. Identification of proteins interacting with PCNA by using PCNA-conjugated resin. (Ref 1, 5)
3. Ubiquitination targets (Ref 4, 9, 10).
- 4 SDS-PAGE (Fig. 1). 5. Western blot (Fig. 2). 6. Dot blot. 7. ELISA. Not tested for other applications.

**Source:** Human PCNA was over-expressed in *E. coli* as a recombinant full-size protein without any tag and highly purified.

**Form:** 1.0 mg/ml in 25 mM HEPES (pH 7.9), 1 mM EDTA,  
0.01% NP40, 1 mM DTT, 2 ug/ml leupeptin, 0.1 mM PMSF, 75 mM NaCl, 50% glycerol.

**Size:** 100 ug

**Storage:** Sent at 4°C or -20°C. Upon arrival spin-down and store at -20°C (or at -80°C for longer storage)

**Purity:** Greater than 98% purity as determined by SDS-PAGE (Fig.1).

**Data Link:** Swiss-Prot [P12004](#) (human), [P04961](#) (rat), [P17918](#) (mouse), [Q9PTP1](#) (Zebrafish).

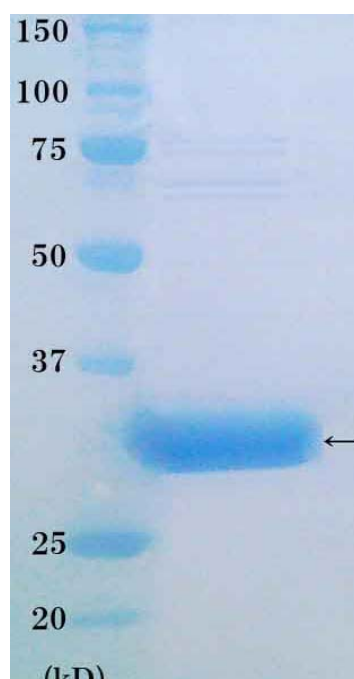
**References:** This product has been used in the following References.

1. Ohta S. et al (2002) A proteomics approach to identify proliferating cell nuclear antigen (PCNA)-binding proteins in human cell lysates. Identification of the human CHL12/RFCs2-5 complex as a novel PCNA-binding protein. *J Biol Chem* **277**: 40362-40367 **PMID:** [12171929](#)
2. Iida T. et al (2002) "PCNA clamp facilitates action of DNA cytosine methyltransferase 1 on hemimethylated DNA. *Genes Cells* **7**: 997-1007 **PMID:** [12354094](#)
3. Shiomi Y, et al (2004) The reconstituted human Chl12-RFC complex functions as a second PCNA loader. *Genes Cells*, **9**:279-90. **PMID:** [15066120](#)
- 4.. Watanabe K, et al. (2004) Rad18 guides pol eta to replication stalling sites through physical interaction and PCNA monoubiquitination. *EMBO J.* **23**:3886-96 **PMID :** [15359278](#)

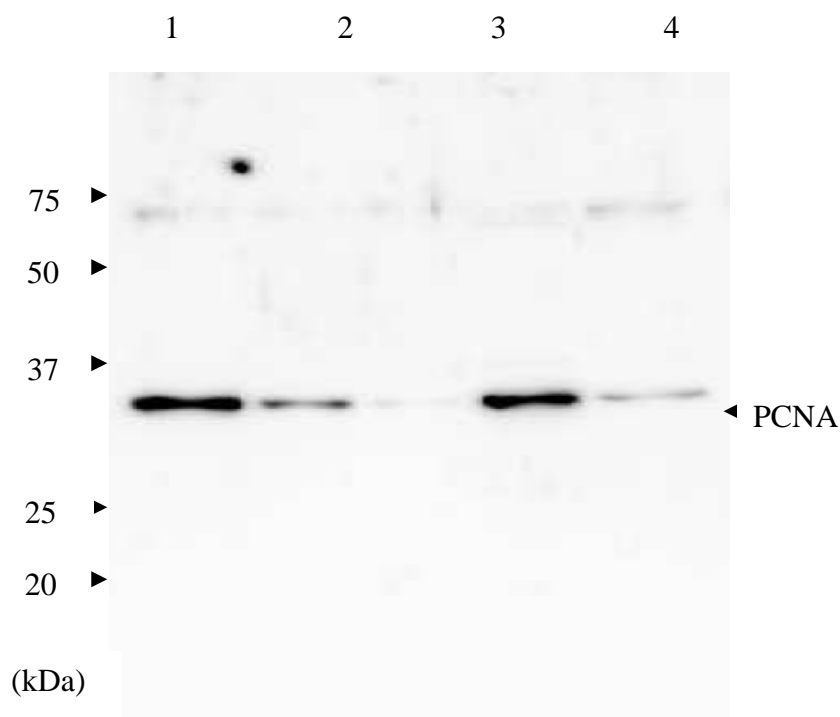


## PCNA(Human)

5. Tsurimoto T, et al. (2005) Human Werner helicase interacting protein 1 (WRNIP1) functions as a novel modulator for DNA polymerase delta. Genes Cells. **10**:13-22. PMID: [15670210](#)
6. Nishitani H, et al. (2006) Two E3 ubiquitin ligases, SCF-Skp2 and DDB1-Cul4, target human Cdt1 for proteolysis. EMBO J. **25**:1126-36. PMID: [16482215](#).
7. Shiomi Y, et al. (2007) A second proliferating cell nuclear antigen loader complex, Ctf18-replication factor C, stimulates DNA polymerase eta activity. J Biol Chem. **282**:20906-14. PMID: [17545166](#).
8. Masuda Y, et al. (2007) Dynamics of human replication factors in the elongation phase of DNA replication. Nucleic Acids Res. **35**:6904-16. PMID: [17932049](#).
9. Tomida J, et al. (2008) DNA damage-induced ubiquitylation of RFC2 subunit of replication factor C complex. J Biol Chem. **283**:9071-9. PMID: [18245774](#).
10. Tsuji Y, et al. (2008) Recognition of forked and single-stranded DNA structures by human RAD18 complexed with RAD6B protein triggers its recruitment to stalled replication forks. Genes Cells. **13**:343-54. PMID: [18363965](#).



**Fig. 1. SDS-PAGE analysis of purified PCNA protein.**



**Fig. 2 Western Blotting of PCNA.** Lane 1; Purified PCNA (3 ng). Lane 2; Purified PCNA (1 ng). Lane 3; Purified PCNA (0.3 ng). Lane 4; Crude extract of HeLa cells (10μg). Lane 5; Crude extract of HeLa cells (2μg) . Primary antibody is anti-PCNA antibody, # 70-080EX.

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