

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 δ , 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: 20 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](#).
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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](#).
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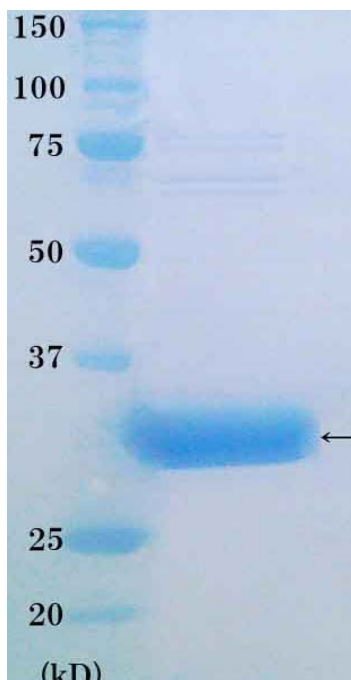


Fig. 1. SDS-PAGE analysis of purified PCNA protein.

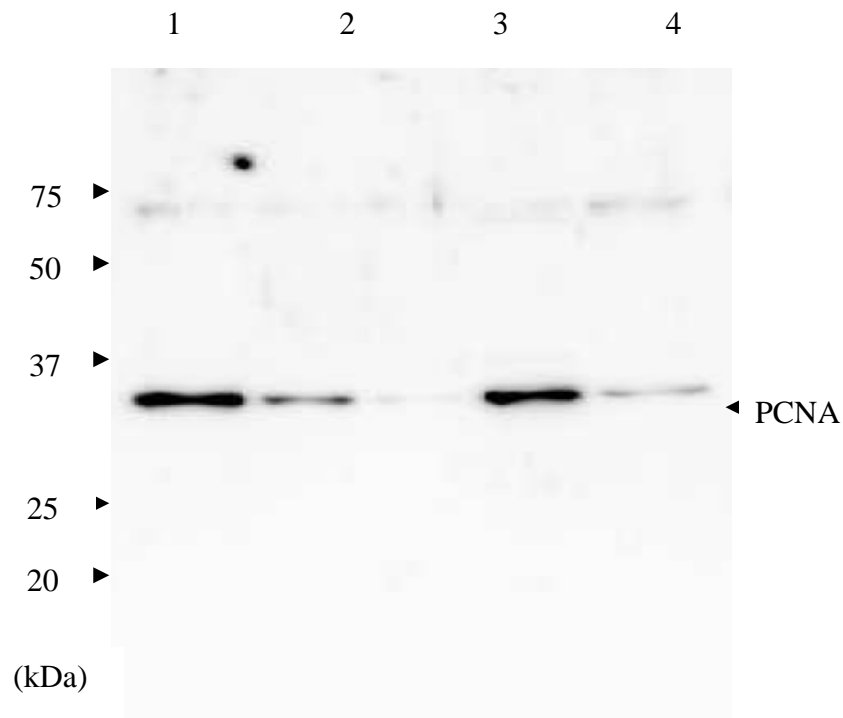


Fig. 2 Western Blotting of PCNA. Lane 1; Purified PCNA (3 ng). Lane 2; Purified PCNA (1 ng). Lane 3; Purified PCNA (0.3 ng). Lane 4; Crude extract of HeLa cells (10µg). Lane 5; Crude extract of HeLa cells (2µg) . Primary antibody is anti-PCNA antibody, # 70-080EX.

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TOYO 2CHOME, KOTO-KU, TOKYO, 135-0016, JAPAN

http://www.cosmobio.co.jp/index_e.asp

E-mail: export@cosmobio.co.jp

Phone : +81-3-5632-9617

FAX : +81-3-5632-9618