

# DNA Ligase III (H-300): sc-292772

## BACKGROUND

DNA Ligase is a type of ligase that can link together DNA strands that have double-strand breaks. DNA Ligase functions in both DNA repair and DNA replication. It is utilized in molecular biology laboratories for recombination experiments. In mammals, the four specific types of DNA Ligase are known as DNA Ligase I, II, III and IV. DNA Ligase I ligates Okazaki fragments during lagging strand DNA replication and some recombinant fragments. DNA Ligase II is an alternatively spliced form of DNA Ligase III found in non-dividing cells. DNA Ligase III complexes with the DNA repair protein XRCC1 to function in sealing base excision mutations and recombinant fragments. DNA Ligase IV complexes with XRCC4 and catalyzes the final step in the non-homologous end joining DNA double-strand break repair pathway.

## REFERENCES

- Lehman, I.R. 1976. DNA Ligase: structure, mechanism, and function. *Science* 186: 790-797.
- Caldecott, K.W., et al. 1994. An interaction between the mammalian DNA repair protein XRCC1 and DNA Ligase III. *Mol. Cell. Biol.* 14: 68-76.
- Wei, Y.F., et al. 1995. Molecular cloning and expression of human cDNAs encoding a novel DNA Ligase IV and DNA Ligase III, an enzyme active in DNA repair and recombination. *Mol. Cell. Biol.* 15: 3206-3216.
- Chen, J., et al. 1995. Mammalian DNA Ligase III: molecular cloning, chromosomal localization, and expression in spermatocytes undergoing meiotic recombination. *Mol. Cell. Biol.* 15: 5412-5422.
- Caldecott, K.W., et al. 1997. XRCC1 poly-peptide interacts with DNA polymerase  $\beta$  and possibly poly (ADP-ribose) polymerase, and DNA Ligase III is a novel molecular "nick-sensor" *in vitro*. *Nucleic Acids Res.* 24: 4387-4394.
- Grawunder, U., et al. 1997. Activity of DNA Ligase IV stimulated by complex formation with XRCC4 protein in mammalian cells. *Nature* 388: 492-495.
- Wilson, T.E., et al. 1997. Yeast DNA Ligase IV mediates non-homologous DNA end joining. *Nature* 388: 495-498.
- Parsons, J.L., et al. 2007. NEIL1 is the major DNA glycosylase that processes 5-hydroxyuracil in the proximity of a DNA single-strand break. *Biochemistry* 46: 4158-4163.
- De, A., et al. 2007. A novel interaction between DNA Ligase III and DNA polymerase  $\gamma$  plays an essential role in mitochondrial DNA stability. *Biochem. J.* 402: 175-186.

## CHROMOSOMAL LOCATION

Genetic locus: LIG3 (human) mapping to 17q12; Lig3 (mouse) mapping to 11 C.

## SOURCE

DNA Ligase III (H-300) is a rabbit polyclonal antibody raised against amino acids 181-480 mapping near the N-terminus of DNA Ligase III of human origin.

## PRODUCT

Each vial contains 200  $\mu$ g IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

DNA Ligase III (H-300) is recommended for detection of DNA Ligase III of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

DNA Ligase III (H-300) is also recommended for detection of DNA Ligase III in additional species, including equine, canine, bovine and porcine.

Suitable for use as control antibody for DNA Ligase III siRNA (h): sc-72079, DNA Ligase III siRNA (m): sc-72086, DNA Ligase III shRNA Plasmid (h): sc-72079-SH, DNA Ligase III shRNA Plasmid (m): sc-72086-SH, DNA Ligase III shRNA (h) Lentiviral Particles: sc-72079-V and DNA Ligase III shRNA (m) Lentiviral Particles: sc-72086-V.

Molecular Weight of DNA Ligase III  $\alpha$ -form: 103 kDa.

Molecular Weight of DNA Ligase III  $\beta$ -form: 96 kDa.

## RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-rabbit IgG-HRP: sc-2004 (dilution range: 1:2000-1:100,000) or Cruz Marker<sup>™</sup> compatible goat anti-rabbit IgG-HRP: sc-2030 (dilution range: 1:2000-1:5000), Cruz Marker<sup>™</sup> Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use goat anti-rabbit IgG-FITC: sc-2012 (dilution range: 1:100-1:400) or goat anti-rabbit IgG-TR: sc-2780 (dilution range: 1:100-1:400) with UltraCruz<sup>™</sup> Mounting Medium: sc-24941.

## STORAGE

Store at 4° C, \*\*DO NOT FREEZE\*\*. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) or our catalog for detailed protocols and support products.



Try **DNA Ligase III (E-7): sc-390922** or **DNA Ligase III (7): sc-135883**, our highly recommended monoclonal alternatives to DNA Ligase III (H-300).