

# DNA Ligase III (6G9): sc-56089

## 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.

## CHROMOSOMAL LOCATION

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

## SOURCE

DNA Ligase III (6G9) is a mouse monoclonal antibody raised against amino acids 1-862 of DNA Ligase III of human origin.

## PRODUCT

Each vial contains 50  $\mu$ g IgG<sub>1</sub> in 0.5 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

DNA Ligase III (6G9) 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) and immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)].

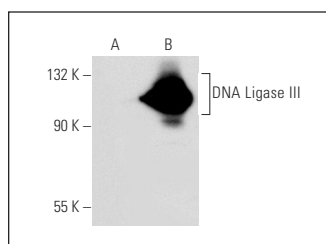
Suitable for use as control antibody for DNA Ligase III siRNA (h): sc-72079, DNA Ligase III siRNA (m): sc-72086, DNA Ligase III shRNA Plasmid (h): sc-72079-SH, DNA Ligase III shRNA Plasmid (m): sc-72086-SH, DNA Ligase III shRNA (h) Lentiviral Particles: sc-72079-V and DNA Ligase III shRNA (m) Lentiviral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

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

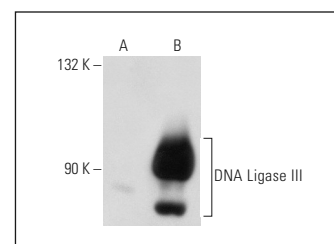
Molecular Weight of DNA Ligase III  $\beta$ -form: 96 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, DNA Ligase III (h2): 293T Lysate: sc-117222 or DNA Ligase III (m): 293T Lysate: sc-125252.

## DATA



DNA Ligase III (6G9): sc-56089. Western blot analysis of DNA Ligase III expression in non-transfected: sc-117752 (A) and mouse DNA Ligase III transfected: sc-125252 (B) 293T whole cell lysates.



DNA Ligase III (6G9): sc-56089. Western blot analysis of DNA Ligase III expression in non-transfected: sc-117752 (A) and human DNA Ligase III transfected: sc-117222 (B) 293T whole cell lysates.

## SELECT PRODUCT CITATIONS

- Rai, R., et al. 2016. TRF2-RAP1 is required to protect telomeres from engaging in homologous recombination-mediated deletions and fusions. *Nat. Commun.* 7: 10881.
- Wisnovsky, S., et al. 2016. Mitochondrial DNA repair and replication proteins revealed by targeted chemical probes. *Nat. Chem. Biol.* 12: 567-573.
- Biehs, R., et al. 2017. DNA double-strand break resection occurs during non-homologous end joining in G<sub>1</sub> but is distinct from resection during homologous recombination. *Mol. Cell.* 65: 671-684.

## 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) for detailed protocols and support products.