

# DNA Ligase I (C-5): sc-271678

## BACKGROUND

DNA Ligase I maintains the major DNA Ligase activity in proliferating cells by joining Okazaki fragments during lagging strand DNA replication. Human DNA Ligase I also has an essential role in DNA repair pathways, where it catalyzes the formation of phosphodiester bonds between adjacent 5' phosphoryl and 3' hydroxy termini at single breaks in duplex DNA molecules. In addition, DNA Ligase I plays a role in sealing nicks during excision repair. Similar to other DNA ligases, DNA Ligase I is built around a common catalytic core. Increased levels of DNA Ligase I are found in human tumors, as compared to benign tissues, as well as in peripheral blood lymphocytes. Furthermore, DNA Ligase I antisense ODN's may decrease tumor cell proliferation, suggesting a potential role for DNA Ligase I as an anti-cancer agent. DNA Ligase I activity is altered in the chromosomal breakage deficit Bloom's syndrome (BS). Individuals with BS either have decreased levels of abnormally thermolabile DNA Ligase I or possess a dimeric form of this enzyme.

## REFERENCES

- Barnes, D.E., et al. 1990. Human DNA Ligase I cDNA: cloning and functional expression in *Saccharomyces cerevisiae*. Proc. Natl. Acad. Sci. USA 87: 6679-6683.
- Petrini, J.H., et al. 1991. A wild-type DNA Ligase I gene is expressed in Bloom's syndrome cells. Proc. Natl. Acad. Sci. USA 88: 7615-7619.

## CHROMOSOMAL LOCATION

Genetic locus: *LIG1* (human) mapping to 19q13.33; *Lig1* (mouse) mapping to 7 A1.

## SOURCE

DNA Ligase I (C-5) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 3-21 at the N-terminus of DNA Ligase I of human origin.

## PRODUCT

Each vial contains 200 µg IgG<sub>1</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

DNA Ligase I (C-5) is available conjugated to agarose (sc-271678 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-271678 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271678 PE), fluorescein (sc-271678 FITC), Alexa Fluor® 488 (sc-271678 AF488), Alexa Fluor® 546 (sc-271678 AF546), Alexa Fluor® 594 (sc-271678 AF594) or Alexa Fluor® 647 (sc-271678 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271678 AF680) or Alexa Fluor® 790 (sc-271678 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-271678 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

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## RESEARCH USE

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

## APPLICATIONS

DNA Ligase I (C-5) is recommended for detection of DNA Ligase I of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg 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).

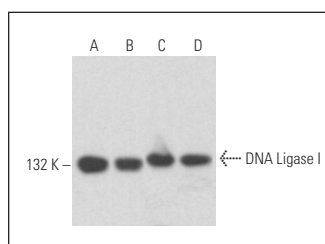
DNA Ligase I (C-5) is also recommended for detection of DNA Ligase I in additional species, including equine.

Suitable for use as control antibody for DNA Ligase I siRNA (h): sc-35198, DNA Ligase I siRNA (m): sc-35199, DNA Ligase I shRNA Plasmid (h): sc-35198-SH, DNA Ligase I shRNA Plasmid (m): sc-35199-SH, DNA Ligase I shRNA (h) Lentiviral Particles: sc-35198-V and DNA Ligase I shRNA (m) Lentiviral Particles: sc-35199-V.

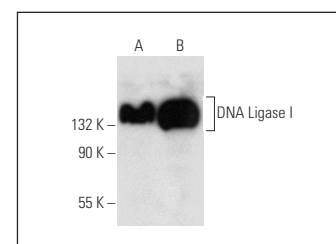
Molecular Weight of DNA Ligase I: 133 kDa.

Positive Controls: Jurkat nuclear extract: sc-2132, HeLa nuclear extract: sc-2120 or MOLT-4 nuclear extract: sc-2151.

## DATA



DNA Ligase I (C-5): sc-271678. Western blot analysis of DNA Ligase I expression in MOLT-4 (A) and Jurkat (B) nuclear extracts and CCRF-CEM (C) and A-431 (D) whole cell lysates.



DNA Ligase I (C-5): sc-271678. Western blot analysis of DNA Ligase I expression in HeLa (A) and MOLT-4 (B) nuclear extracts.

## SELECT PRODUCT CITATIONS

- Long, Q., et al. 2017. The role of host DNA ligases in hepadnavirus covalently closed circular DNA formation. PLoS Pathog. 13: e1006784.
- Sobczak, M., et al. 2019. PARP1 co-regulates EP300-BRG1-dependent transcription of genes involved in breast cancer cell proliferation and DNA repair. Cancers 11: 1539.
- Sobczak, M., et al. 2020. BRG1 activates proliferation and transcription of cell cycle-dependent genes in breast cancer cells. Cancers 12: 349.
- Cong, K., et al. 2021. Replication gaps are a key determinant of PARP inhibitor synthetic lethality with BRCA deficiency. Mol. Cell 81: 3128-3144.e7.

## STORAGE

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