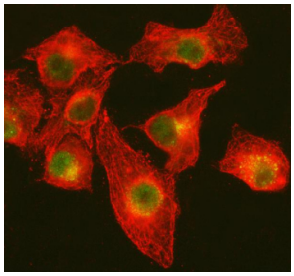
LIG4 Antibody / DNA Ligase 4 (FY13129)

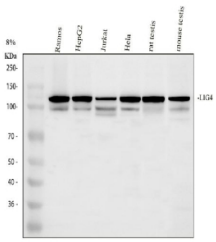
Catalog No.	Formulation	Size
FY13129	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

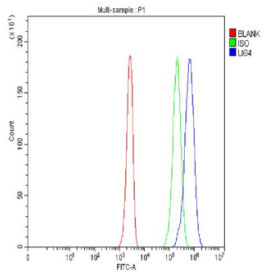
Availability	1-2 days
Species Reactivity	Human, Mouse, Rat
Format	Lyophilized
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	P49917
Localization	Nuclear
Applications	Western Blot: 0.25-0.5ug/ml Immunocytochemistry: 5ug/ml Immunofluorescence: 5ug/ml Flow cytometry: 1-3ug/million cells ELISA: 0.1-0.5ug/ml
Limitations	This LIG4 antibody is available for research use only.



Immunofluorescent staining of DNA Ligase IV/LIG4 using anti-LIG4 antibody (green) and anti-Tubulin Alpha antibody (red). DNA Ligase IV/LIG4 was detected in immunocytochemical section of cell. Enzyme antigen retrieval was performed using IHC enzyme antigen retrieval reagent for 15 mins. The cells were blocked with 10% goat serum. And then incubated with 5 ug/ml rabbit anti-DNA Ligase IV/LIG4 antibody and mouse anti-Tubulin Alpha antibody overnight at 4oC. Cy3 Conjugated Goat Anti-Rabbit IgG and DyLight 488 Conjugated Goat Anti-Mouse IgG were used as secondary antibody at 1:500 dilution and incubated for 30 minutes at 37oC. Visualize using a fluorescence microscope and filter sets appropriate for the label used.



Western blot analysis of LIG4 using anti-LIG4 antibody. Electrophoresis was performed on a 8% SDS-PAGE gel at 80V (Stacking gel) / 120V (Resolving gel) for 2 hours. Lane 1: human Ramos whole cell lysates, Lane 2: human HepG2 whole cell lysates, Lane 3: human jurkat whole cell lysates, Lane 4: human Hela whole cell lysates, Lane 5: rat testis tissue lysates, Lane 6: mouse testis tissue lysates. After electrophoresis, proteins were transferred to a nitrocellulose membrane at 150 mA for 50-90 minutes. Blocked the membrane with 5% non-fat milk/TBS for 1.5 hour at RT. The membrane was incubated with rabbit anti-LIG4 antibody at 0.5 ug/ml overnight at 4oC, then washed with TBS-0.1%Tween 3 times with 5 minutes each and probed with a goat anti-rabbit IgG-HRP secondary antibody at a dilution of 1:5000 for 1.5 hour at RT. The signal was developed using an ECL Plus Western Blotting Substrate. LIG4 antibody detects a primary band at ~110 kDa across the indicated human and rodent lysates, consistent with full-length DNA ligase IV. Although the theoretical mass is ~104 kDa, slower migration is typical due to phosphorylation and the acidic C-terminal domain. Additional weaker bands just below 100 kDa likely represent partially dephosphorylated or proteolytically processed forms of LIG4.



Flow Cytometry analysis of Jurkat cells using anti-LIG4 antibody. Overlay histogram showing Jurkat cells stained with (Blue line). To facilitate intracellular staining, cells were fixed with 4% paraformaldehyde and permeabilized with permeabilization buffer. The cells were blocked with 10% normal goat serum. And then incubated with rabbit anti-LIG4 antibody (1 ug/million cells) for 30 min at 20oC. DyLight 488 conjugated goat anti-rabbit IgG (5-10 ug/million cells) was used as secondary antibody for 30 minutes at 20oC. Isotype control antibody (Green line) was rabbit IgG (1 ug/million cells) used under the same conditions. Unlabelled sample without incubation with primary antibody and secondary antibody (Red line) was used as a blank control.

Description

LIG4 antibody detects DNA ligase 4, an essential enzyme that catalyzes the final ligation step in non-homologous end joining (NHEJ) DNA repair. The UniProt recommended name is DNA ligase 4 (LIG4). This enzyme joins DNA double-strand breaks generated during recombination, replication stress, or DNA damage, preserving genome stability.

Functionally, LIG4 antibody identifies a 911-amino-acid ATP-dependent DNA ligase that seals nicks in double-stranded DNA by catalyzing phosphodiester bond formation. LIG4 operates in complex with XRCC4 and XLF/Cernunnos to align DNA ends and complete repair during NHEJ. It also plays a critical role in V(D)J recombination in lymphocytes, supporting immune diversity.

The LIG4 gene is located on chromosome 13q33.3 and is ubiquitously expressed in proliferating tissues. Its expression is highest in immune cells, where DNA recombination occurs frequently. Proper function of LIG4 ensures efficient DNA repair and prevents chromosomal translocations and mutagenesis.

Pathologically, mutations in LIG4 cause Ligase IV syndrome, characterized by microcephaly, developmental delay, immunodeficiency, and radiosensitivity. Deficiency in LIG4 impairs DNA double-strand break repair, leading to genomic instability and increased cancer susceptibility. Research using LIG4 antibody aids in studies of DNA repair, recombination, and genomic maintenance.

LIG4 antibody is validated for western blotting, immunohistochemistry, and immunofluorescence to detect ligase enzymes in DNA damage response pathways. NSJ Bioreagents provides LIG4 antibody reagents optimized for DNA repair, oncology, and immunology research.

Structurally, DNA ligase 4 contains an N-terminal DNA-binding domain, an adenylation domain that binds AMP, and a C-terminal XRCC4-interacting region necessary for NHEJ complex formation. This antibody enables detailed analysis of

LIG4's enzymatic activity in genome integrity and repair pathways.

Application Notes

Optimal dilution of the LIG4 antibody should be determined by the researcher.

Immunogen

E.coli-derived human DNA Ligase IV/LIG4 recombinant protein (Position: M1-K876) was used as the immunogen for the LIG4 antibody.

Storage

After reconstitution, the LIG4 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.

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