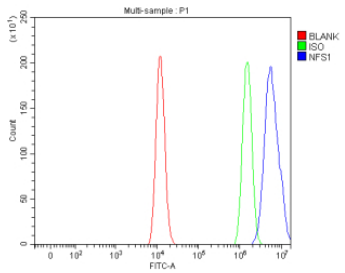
NFS1 Antibody / Cysteine desulfurase (FY13373)

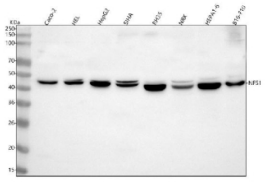
Catalog No.	Formulation	Size
FY13373	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

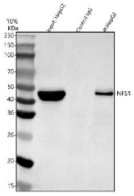
Availability	1-2 days
Species Reactivity	Human, Mouse, Rat
Format	Lyophilized
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	Q9Y697
Applications	Western Blot : 0.25-0.5ug/ml Immunoprecipitation : 2-4ug/500ug of lysate Flow Cytometry : 1-3ug/million cells ELISA : 0.1-0.5ug/ml
Limitations	This NFS1 antibody is available for research use only.



Flow Cytometry analysis of HEL cells using anti-NFS1 antibody. Overlay histogram showing HEL 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-NFS1 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 (Red line) was also used as a control.



Western blot analysis of NFS1 using anti-NFS1 antibody. Lane 1: human Caco-2 whole cell lysates, Lane 2: human HEL whole cell lysates, Lane 3: human HepG2 whole cell lysates, Lane 4: human SIHA whole cell lysates, Lane 5: rat RH35 whole cell lysates, Lane 6: rat NRK whole cell lysates, Lane 7: mouse HEPA1-6 whole cell lysates, Lane 8: mouse B16-F10 whole cell 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-NFS1 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 enhanced chemiluminescent. A band at ~45 kDa is observed in all samples, consistent with the mature, mitochondrial-processed form of NFS1, which runs below its predicted 50 kDa. Some samples show a faint doublet, which has been reported in the literature and may reflect partial presequence processing or post-translational modification.



Immunoprecipitating NFS1 in HepG2 whole cell lysate. Western blot analysis of NFS1 using anti-NFS1 antibody; Lane 1: HepG2 whole cell lysates (30ug); Lane 2: Rabbit control IgG instead of anti-NFS1 antibody in HepG2 whole cell lysate; Lane 3: anti-NFS1 antibody (2ug) + HepG2 whole cell lysate (500ug). After electrophoresis, proteins were transferred to a membrane. Then the membrane was incubated with rabbit anti-NFS1 antibody at a dilution of 0.5 ug/ml and probed with a goat anti-rabbit IgG-HRP secondary antibody. The signal is developed using ECL Plus Western Blotting Substrate. A band at ~45 kDa is observed, consistent with the mature, mitochondrial-processed form of NFS1, which runs below its predicted 50 kDa.

Description

NFS1 antibody detects Cysteine desulfurase, a mitochondrial enzyme encoded by the NFS1 gene on chromosome 20q11.22. NFS1 is essential for the biosynthesis of iron-sulfur (Fe-S) clusters, which serve as cofactors for a wide range of enzymes involved in electron transport, metabolic catalysis, and DNA repair. NFS1 catalyzes the conversion of L-cysteine to alanine, providing sulfur atoms for Fe-S cluster assembly within the mitochondrial matrix. This reaction represents the first committed step of Fe-S cluster formation, fundamental to mitochondrial respiration and cellular energy metabolism.

Structurally, NFS1 is a pyridoxal phosphate (PLP)-dependent enzyme that functions as a homodimer. It forms a core part of the Fe-S cluster assembly complex with ISCU (scaffold protein), ISD11, ACP (acyl carrier protein), and FXN (Frataxin). NFS1 donates sulfur from cysteine via a persulfide intermediate, which is transferred to ISCU for subsequent cluster assembly. The protein belongs to the cysteine desulfurase family, conserved across prokaryotes and eukaryotes. Co-localization studies show NFS1 residing in the mitochondrial matrix, where it coexists with other Fe-S biosynthesis factors such as ISCU and FXN.

Functionally, NFS1 supports the biogenesis of Fe-S cluster-dependent enzymes including aconitase, succinate dehydrogenase, and DNA polymerase complexes. It plays a key role in oxidative phosphorylation, the tricarboxylic acid (TCA) cycle, and cellular redox homeostasis. In addition to mitochondrial roles, NFS1 also provides sulfur for cytosolic Fe-S protein assembly via the iron-sulfur cluster export machinery. Known interaction partners include ISD11, FXN, and NUBP2, which together ensure the stability and efficiency of sulfur transfer and cluster formation.

Dysregulation or mutation of NFS1 disrupts Fe-S cluster biogenesis and results in severe mitochondrial dysfunction. Deficiency causes combined oxidative phosphorylation deficiency 20 (COXPD20), characterized by lactic acidosis, developmental delay, and myopathy. In cancer, altered NFS1 expression influences metabolic reprogramming and redox balance. Pathway associations include iron-sulfur cluster biosynthesis, oxidative phosphorylation, and mitochondrial sulfur metabolism. Expression of NFS1 is particularly high in metabolically active tissues such as heart, liver, and skeletal muscle.

The NFS1 antibody from NSJ Bioreagents is a reliable reagent for research on mitochondrial biogenesis, redox regulation, and metabolic enzyme assembly.

Application Notes

Optimal dilution of the NFS1 antibody should be determined by the researcher.

Immunogen

E.coli-derived human NFS1 recombinant protein (Position: R107-L356) was used as the immunogen for the NFS1 antibody.

Storage

After reconstitution, the NFS1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.