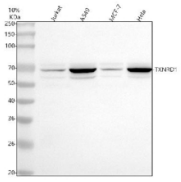
TXNRD1 Antibody / Thioredoxin reductase 1 (FY13051)

Catalog No.	Formulation	Size
FY13051	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
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	Q16881
Applications	Western Blot : 0.25-0.5ug/ml ELISA : 0.1-0.5ug/ml
Limitations	This TXNRD1 antibody is available for research use only.



Western blot analysis of TXNRD1 using anti-TXNRD1 antibody. Lane 1: human Jurkat whole cell lysates, Lane 2: human whole cell lysates, Lane 3: human MCF-7 whole cell lysates, Lane 4: human Hela 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-TXNRD1 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 strong band is detected at ~65 kDa, with a weaker band at ~60 kDa, while the theoretical molecular weight of TXNRD1 is ~71 kDa. This downward shift is commonly reported and reflects the migration properties of the cytosolic selenoprotein, which often runs ~5-10 kDa lower than predicted. The two bands likely correspond to the major TXNRD1 isoform (~65 kDa) and a C-terminally truncated variant (~60 kDa) lacking the selenocysteine-containing tail.

Description

TXNRD1 antibody detects Thioredoxin reductase 1, a selenocysteine-containing enzyme that maintains cellular redox balance by catalyzing the NADPH-dependent reduction of thioredoxin. The UniProt recommended name is Thioredoxin

reductase 1 (TXNRD1). This enzyme is a central component of the thioredoxin system, which regulates antioxidant defense, DNA synthesis, and redox signaling.

Functionally, TXNRD1 antibody identifies a 654-amino-acid cytosolic enzyme composed of an FAD-binding domain, NADPH-binding domain, and a selenocysteine-containing active site motif (GCUG). TXNRD1 reduces oxidized thioredoxin, which in turn regenerates reduced cysteine residues in target proteins, maintaining redox homeostasis. It also directly reduces lipid hydroperoxides, hydrogen peroxide, and other disulfide-containing molecules, contributing to cellular antioxidant capacity.

The TXNRD1 gene is located on chromosome 12q23.3 and encodes the cytosolic isoform of thioredoxin reductase. TXNRD1 expression is regulated by the transcription factor NRF2 through the antioxidant response element (ARE) under oxidative or electrophilic stress. Its activity is essential for maintaining a reducing intracellular environment, supporting cell survival, and modulating signaling pathways such as apoptosis and proliferation.

In redox biology, TXNRD1 plays a dual role: it protects cells from oxidative stress yet also supports cancer cell survival under high metabolic demand. Elevated TXNRD1 expression is frequently observed in tumors, where it promotes resistance to chemotherapeutic agents and radiotherapy. Conversely, TXNRD1 inhibition induces oxidative stress, mitochondrial dysfunction, and apoptosis, making it a therapeutic target for cancer and inflammatory diseases.

Beyond oncology, TXNRD1 contributes to immune function, lipid metabolism, and cardiovascular health. Its deficiency leads to increased susceptibility to oxidative damage, accelerated aging, and metabolic imbalance. In experimental models, altered TXNRD1 expression affects insulin sensitivity and lipid peroxidation levels, linking it to metabolic and neurodegenerative disorders.

TXNRD1 antibody is widely used in redox biology, metabolism, and cancer research. It is suitable for western blotting, immunohistochemistry, and enzymatic assays to monitor TXNRD1 expression and activity. This antibody supports investigations into antioxidant defense, redox signaling, and selenoprotein regulation. In pharmacology, it helps evaluate TXNRD1 as a biomarker of oxidative stress and drug response.

Structurally, TXNRD1 forms a homodimer with active sites on each subunit and utilizes FAD and NADPH cofactors for electron transfer. Its C-terminal selenocysteine residue is critical for catalytic turnover. NSJ Bioreagents provides TXNRD1 antibody reagents validated for use in redox homeostasis, antioxidant enzyme, and cancer metabolism research.

Application Notes

Optimal dilution of the TXNRD1 antibody should be determined by the researcher.

Immunogen

E.coli-derived human TXNRD1 recombinant protein (Position: Y93-Y326) was used as the immunogen for the TXNRD1 antibody.

Storage

After reconstitution, the TXNRD1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.