SANTA CRUZ BIOTECHNOLOGY, INC.

TrxR2 (D-12): sc-166259



BACKGROUND

Thioredoxin (Trx) is a redox protein that is found in several species, such as bacteria, plants and mammals, and contains a conserved active site, consisting of Trp-Cys-Gly-Pro-Cys. Trx has several biological functions. It acts as a hydrogen donor for ribonucleotide reductase, which is critical for DNA synthesis and modulates the DNA-binding activity of several transcription factors, including NFkB, AP-1, p53, TFIIIC and glucocorticoid receptor. Trx also stimulates cell growth, is an inhibitor of apoptosis and plays a role in the protection against oxidative stress. Drugs that inhibit Trx have antitumor activity, suggesting that Trx is involved in a variety of human diseases, including cancer. Thioredoxin 2 (Trx-2) is a small redox protein that is localized to the mitochondria and is essential for cell viability, playing a crucial role in the scavenging of ROS in mitochondria and regulating the mitochondrial apoptosis signaling pathway. Trx reductases (TrxR1 and TrxR2) are ubiquitously expressed flavoproteins that catalyze the NADPH-dependent reduction of Trx as well as several other oxidized cellular components. Mammalian Trx reductases are a part of a selenium-containing pyridine nucleotide-disulphide oxidoreductase family, which has a conserved catalytic site of Cys-Val-Asn-Val-Gly-Cys. TrxR1 and TrxR2 are also involved in the prevention of oxidative stress. Inhibition of TrxR activity may provide for potential treatments of cancer, AIDS and other auto-immune diseases, as well as bacterial infections and parasitic diseases.

REFERENCES

- 1. Soderberg, A., et al. 1998. Monoclonal antibodies to human thioredoxin reductase. Biochem. Biophys. Res. Commun. 249: 86-89.
- Lee, S.R., et al. 1999. Molecular cloning and characterization of a mitochondrial selenocysteine-containing thioredoxin reductase from rat liver. J. Biol. Chem. 274: 4722-4734.
- Miranda-Vizuete, A., et al. 1999. Human mitochondrial thioredoxin reductase cDNA cloning, expression and genomic organization. Eur. J. Biochem. 261: 405-412.
- Gorlatov, S.N. and Stadtman, T.C. 1999. Human selenium-dependent thioredoxin reductase from HeLa cells: properties of forms with differing heparin affinities. Arch. Biochem. Biophys. 369: 133-142.

SOURCE

TrxR2 (D-12) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 376-402 near the C-terminus of TrxR2 of human origin.

PRODUCT

Each vial contains 200 μg lgG_{2b} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-166259 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

STORAGE

Store at 4° C, **D0 NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

APPLICATIONS

TrxR2 (D-12) is recommended for detection of TrxR2 isoforms 1, 2, 3 and 4 of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g 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).

TrxR2 (D-12) is also recommended for detection of TrxR2 isoforms 1, 2, 3, and 4 in additional species, including equine, canine, porcine and avian.

Suitable for use as control antibody for TrxR2 siRNA (h): sc-45819, TrxR2 siRNA (m): sc-45820, TrxR2 shRNA Plasmid (h): sc-45819-SH, TrxR2 shRNA Plasmid (m): sc-45820-SH, TrxR2 shRNA (h) Lentiviral Particles: sc-45819-V and TrxR2 shRNA (m) Lentiviral Particles: sc-45820-V.

Molecular Weight of TrxR2: 56-57 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, K-562 whole cell lysate: sc-2203 or Hep G2 cell lysate: sc-2227.

DATA





TrxR2 (D-12): sc-166259. Western blot analysis of TrxR2 expression in K-562 (**A**), A-431 (**B**), Caki-1 (**C**) A549 (**D**), A-10 (**E**) and c4 (**F**) whole cell lysates. TrxR2 (D-12): sc-166259. Western blot analysis of TrxR2 expression in HeLa (A), K-562 (B), Hep G2 (C), RAW 264.7 (D), PC-12 (E) and RBL-1 (F) whole cell lysates.

SECELCT PRODUCT CITATIONS

- 1. Yan, J., et al. 2013. Selenium effect on selenoprotein transcriptome in chondrocytes. Biometals 26: 285-296.
- Folda, A., et al. 2016. Mitochondrial thioredoxin system as a modulator of cyclophilin D redox state. Sci. Rep. 6: 23071.
- Song, Y., et al. 2018. Sirtuin 3-dependent mitochondrial redox homeostasis protects against AGEs-induced intervertebral disc degeneration. Redox Biol. 19: 339-353.
- Scalcon, V., et al. 2019. Dimers of glutaredoxin 2 as mitochondrial redox sensors in selenite-induced oxidative stress. Metallomics 11: 1241-1251.
- Singh, L.P., et al. 2021. Potential combination drug therapy to prevent redox stress and mitophagy dysregulation in retinal Müller cells under high glucose conditions: implications for diabetic retinopathy. Diseases 9: 91.

RESEARCH USE

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