SANTA CRUZ BIOTECHNOLOGY, INC.

TrxR1 (19A1): sc-58444

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 NFκB, 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 anti-tumor activity, suggesting that thioredoxin is involved in a variety of human diseases, including cancer. TrxR is an ubiquitously expressed flavoprotein that catalyzes the NADPH-dependent reduction of thioredoxin as well as several other oxidized cellular components. Mammalian TrxR is a part of a selenium-containing pyridine nucleotide-disulphide oxidoreductase family, which has a conserved catalytic site of Cys-Val-Asn-Val-Gly-Cys. The two known forms of TrxR, 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 autoimmune diseases as well as bacterial infections and parasitic diseases.

REFERENCES

1. Junn, E., et al. 2000. Vitamin D_3 upregulated protein 1 mediates oxidative stress via suppressing the thioredoxin function. J. Immunol. 164: 6287-6295.
2. Tanaka, T., et al. 2000. Redox regulation by thioredoxin superfamily; protection against oxidative stress and aging. Free Radic. Res. 33: 851-855.
3. Arner, E.S., et al. 2000. Physiological functions of thioredoxin and thioredoxin reductase. Eur. J. Biochem. 267: 6102-6109.
4. Williams, C.H., et al. 2000. Thioredoxin reductase two modes of catalysis have evolved. Eur. J. Biochem. 267: 6110-6117.
5. Becker, K., et al. 2000. Thioredoxin reductase as a pathophysiological factor and drug target. Eur. J. Biochem. 267: 6118-6125.
6. Mustacich, D., et al. 2000. Thioredoxin reductase. Biochem. J. 346: 1-8.

CHROMOSOMAL LOCATION

Genetic locus: TXNRD1 (human) mapping to 12q23.3.

SOURCE

TrxR1 (19A1) is a mouse monoclonal antibody raised against full length TrxR1 of human origin.

PRODUCT

Each vial contains IgG_1 in 50 µl of HEPES with 0.15 M NaCl, 50% glycerol, 0.03% sodium azide and 0.01% stabilizer protein..

STORAGE

For immediate and continuous use, store at 4° C for up to one month. For sporadic use, freeze in working aliquots in order to avoid repeated freeze/thaw cycles. If turbidity is evident upon prolonged storage, clarify solution by centrifugation.

APPLICATIONS

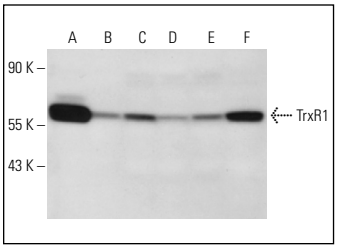
TrxR1 (19A1) is recommended for detection of TrxR1 of human origin by Western Blotting (starting dilution to be determined by researcher, dilution range 1:100-1:5000), immunoprecipitation [1-2 µl per 100-500 µg of total protein (1 ml of cell lysate)] and solid phase ELISA (starting dilution to be determined by researcher, dilution range 1:30-1:5000).

Suitable for use as control antibody for TrxR1 siRNA (h): sc-36750, TrxR1 shRNA Plasmid (h): sc-36750-SH and TrxR1 shRNA (h) Lentiviral Particles: sc-36750-V.

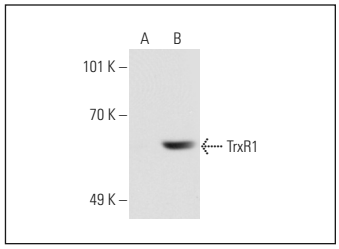
Molecular Weight of TrxR1: 55 kDa.

Positive Controls: A549 cell lysate: sc-2413, TrxR1 (h): 293 Lysate: sc-113112 or Jurkat whole cell lysate: sc-2204.

DATA



TrxR1 (19A1): sc-58444. Western blot analysis of TrxR1 expression in A549 (**A**), JAR (**B**), Jurkat (**C**), HuT 78 (**D**), ALL-SIL (**E**) and WI 38 (**F**) whole cell lysates.



TrxR1 (19A1): sc-58444. Western blot analysis of TrxR1 expression in non-transfected: sc-110760 (**A**) and human TrxR1 transfected: sc-113112 (**B**) 293 whole cell lysates.

SELECT PRODUCT CITATIONS

1. Prast-Nielsen, S., et al. 2010. Noble metal targeting of thioredoxin reductase—covalent complexes with thioredoxin and thioredoxin-related protein of 14 kDa triggered by cisplatin. Free Radic. Biol. Med. 49: 1765-1778.
2. Xu, J., et al. 2015. The conserved Trp114 residue of thioredoxin reductase 1 has a redox sensor-like function triggering oligomerization and crosslinking upon oxidative stress related to cell death. Cell Death Dis. 6: e1616.
3. Dóka, E., et al. 2016. A novel persulfide detection method reveals protein persulfide- and polysulfide-reducing functions of thioredoxin and glutathione systems. Sci. Adv. 2: e1500968.
4. Clapper, E., et al. 2020. Cross-talk between Bcr-Abl and the thioredoxin system in chronic myeloid leukaemia: implications for CML treatment. Antioxidants 9: 207.

RESEARCH USE

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