

TrxR1 (A-9): sc-365658

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 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 autoimmune diseases as well as bacterial infections and parasitic diseases.

REFERENCES

1. Junn, E., et al. 2000. Vitamin D₃ 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.

CHROMOSOMAL LOCATION

Genetic locus: TXNRD1 (human) mapping to 12q23.3; Txnrd1 (mouse) mapping to 10 C1.

SOURCE

TrxR1 (A-9) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 473-496 at the C-terminus of TrxR1 of human origin.

PRODUCT

Each vial contains 200 µg IgG₁ 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-365658 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

STORAGE

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

APPLICATIONS

TrxR1 (A-9) is recommended for detection of precursor and mature TrxR1 of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg 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).

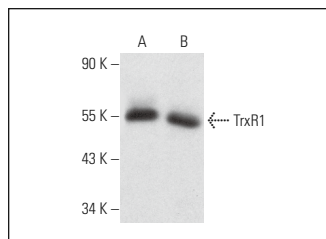
TrxR1 (A-9) is also recommended for detection of precursor and mature TrxR1 in additional species, including canine and porcine.

Suitable for use as control antibody for TrxR1 siRNA (h): sc-36750, TrxR1 siRNA (m): sc-36751, TrxR1 shRNA Plasmid (h): sc-36750-SH, TrxR1 shRNA Plasmid (m): sc-36751-SH, TrxR1 shRNA (h) Lentiviral Particles: sc-36750-V and TrxR1 shRNA (m) Lentiviral Particles: sc-36751-V.

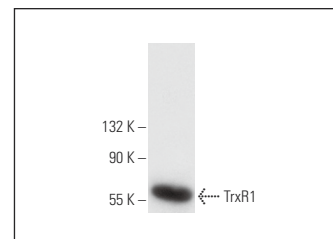
Molecular Weight of TrxR1: 55 kDa.

Positive Controls: A549 cell lysate: sc-2413, WI-38 whole cell lysate: sc-364260 or HeLa whole cell lysate: sc-2200.

DATA



TrxR1 (A-9): sc-365658. Western blot analysis of TrxR1 expression in HeLa (A) and WI-38 (B) whole cell lysates.



TrxR1 (A-9): sc-365658. Western blot analysis of TrxR1 expression in A549 whole cell lysate.

SELECT PRODUCT CITATIONS

1. Artero-Castro, A., et al. 2015. Disruption of the ribosomal P complex leads to stress-induced autophagy. *Autophagy* 11: 1499-1519.
2. Zhao, J., et al. 2017. Proteomic analysis of oridonin-induced apoptosis in multiple myeloma cells. *Mol. Med. Rep.* 15: 1807-1815.
3. Mbiandjeu, S.C.T., et al. 2024. Nrf2 plays a key role in erythropoiesis during aging. *Antioxidants* 13: 454.

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.



See **TrxR1 (B-2): sc-28321** for TrxR1 antibody conjugates, including AC, HRP, FITC, PE, and Alexa Fluor® 488, 546, 594, 647, 680 and 790.