

# TrxR1 (B-2): sc-28321

## 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.

## CHROMOSOMAL LOCATION

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

## SOURCE

TrxR1 (B-2) is a mouse monoclonal antibody raised against amino acids 71-340 of TrxR1 of human origin.

## PRODUCT

Each vial contains 200 µg IgG<sub>2a</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

TrxR1 (B-2) is available conjugated to agarose (sc-28321 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-28321 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-28321 PE), fluorescein (sc-28321 FITC), Alexa Fluor® 488 (sc-28321 AF488), Alexa Fluor® 546 (sc-28321 AF546), Alexa Fluor® 594 (sc-28321 AF594) or Alexa Fluor® 647 (sc-28321 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-28321 AF680) or Alexa Fluor® 790 (sc-28321 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

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## STORAGE

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

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.

## APPLICATIONS

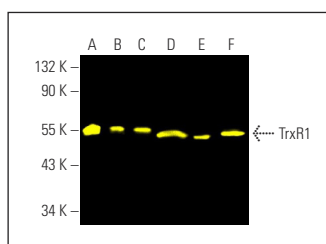
TrxR1 (B-2) is recommended for detection of TrxR1 of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1,000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

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.

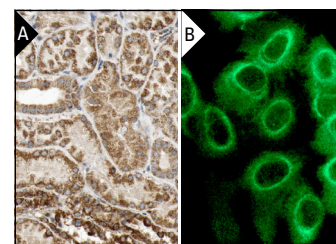
Molecular Weight of TrxR1: 55 kDa.

Positive Controls: L8 cell lysate: sc-3807, RAW 264.7 whole cell lysate: sc-2211 or A549 cell lysate: sc-2413.

## DATA



TrxR1 (B-2) Alexa Fluor® 488: sc-28321 AF488. Direct fluorescent western blot analysis of TrxR1 expression in A549 (A), HeLa (B), WI-38 (C), RAW 264.7 (D), L8 (E) and JAR (F) whole cell lysates. Blocked with UltraCruz® Blocking Reagent: sc-516214.



TrxR1 (B-2): sc-28321. Immunoperoxidase staining of formalin fixed, paraffin-embedded human kidney tissue showing cytoplasmic staining of cells in glomeruli and tubuli. Kindly provided by The Swedish Human Protein Atlas (HPA) program (A). Immunofluorescence staining of methanol-fixed A549 cells showing cytoplasmic localization (B).

## SELECT PRODUCT CITATIONS

1. Dammeyer, P., et al. 2008. Induction of cell membrane protrusions by the N-terminal glutaredoxin domain of a rare splice variant of human thioredoxin reductase 1. *J. Biol. Chem.* 283: 2814-2821.
2. Kang, J.S., et al. 2016. An exploration of the antioxidant effects of garlic saponins in mouse-derived C2C12 myoblasts. *Int. J. Mol. Med.* 37: 149-156.
3. Lou, M., et al. 2017. Physical interaction between human ribonucleotide reductase large subunit and thioredoxin increases colorectal cancer malignancy. *J. Biol. Chem.* 292: 9136-9149.
4. Zhuge, W., et al. 2018. Costunolide specifically binds and inhibits thioredoxin reductase 1 to induce apoptosis in colon cancer. *Cancer Lett.* 412: 46-58.
5. Bryant, K.L., et al. 2019. Combination of ERK and autophagy inhibition as a treatment approach for pancreatic cancer. *Nat. Med.* 25: 628-640.

## RESEARCH USE

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