SANTA CRUZ BIOTECHNOLOGY, INC.

TrxR1 (A-20): sc-18220

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

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 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. and Holmgren, A. 2000. Physiological functions of thioredoxin and thioredoxin reductase. Eur. J. Biochem. 267: 6102-6109.

CHROMOSOMAL LOCATION

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

SOURCE

TrxR1 (A-20) is an affinity purified goat polyclonal antibody raised against a peptide mapping within an internal region of TrxR1 of human origin.

PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-18220 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

STORAGE

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

RESEARCH USE

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

APPLICATIONS

TrxR1 (A-20) is recommended for detection of precursor and mature thioredoxin reductase 1 (TrxR1) of human and, to a lesser extent, rat origin by Western Blotting (starting dilution 1:200, 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).

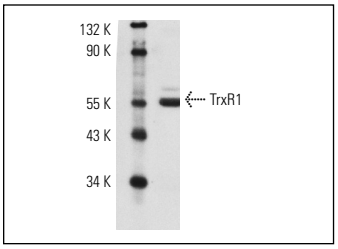
TrxR1 (A-20) is also recommended for detection of precursor and mature thioredoxin reductase 1 (TrxR1) in additional species, including canine and porcine.

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: JAR cell lysate: sc-2276, A549 cell lysate: sc-2413 or IB4 whole cell lysate.

DATA



TrxR1 (A-20): sc-18220. Western blot analysis of thioredoxin reductase expression in IB4 whole cell lysate.

SELECT PRODUCT CITATIONS

1. Seemann, S. and Hainaut, P. 2005. Roles of thioredoxin reductase 1 and APE/Ref-1 in the control of basal p53 stability and activity. Oncogene 24: 3853-3863.
2. Chew, E.H., et al. 2010. Cinnamaldehydes inhibit thioredoxin reductase and induce Nrf2: potential candidates for cancer therapy and chemoprevention. Free Radic. Biol. Med. 48: 98-111.
3. Lee, C.Y., et al. 2010. Functionalized aurones as inducers of NAD(P)H: quinone oxidoreductase 1 that activate AhR/XRE and Nrf2/ARE signaling pathways: synthesis, evaluation and SAR. Eur. J. Med. Chem. 45: 2957-2971.