

Active Recombinant Rat Thioredoxin Reductase 1

Cat. No. Txnrd1-126R Lot. No. (See product label)

SPECIFICATION

Species

Rat

Source

E.coli

Description

This gene encodes a member of the family of pyridine nucleotide-disulfide oxidoreductases. This protein is a flavoenzyme, which uses NADPH for reduction of thioredoxins as well as other protein and nonprotein substrates, and plays a role in protection against oxidative stress. It contains a selenocysteine (Sec) residue, which is essential for catalytic activity. The selenocysteine is encoded by the UGA codon that normally signals translation termination. The 3' UTR of Sec-containing genes have a common stem-loop structure, the sec insertion sequence (SECIS), that is necessary for the recognition of UGA as a Sec codon, rather than as a stop signal.

Bio-activity

One ampoule contains 340 µof recombinant rat thioredoxin reductase 1 (TrxR1) in 50 mM Tris-HCl, 1 mM EDTA, pH 7.5 and 50 percent glycerol with a total activity of 10.5 units and 0.3 mg of active enzyme protein. One unit of enzyme catalyses oxidation of one micromol of NADPH per min under standard mammalian TrxR assay conditions in the presence of 5 mM DTNB.

Notes

Some solution may stick to the rubber cover or stay on the walls of the vial. This enzyme is expressed in E.coli gor mutant and is thus free of glutathione reductase activity. Pure thioredoxin reductase is 35 Units per mg protein and has a molecular mass of 112 000 with two identical subunits. Due to UGA codon acting as stop this preparation contains about 50 percent of the truncated protein lacking the Sec-Gly C-

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terminus. It is homogenous on Western blots. The truncated protein is folded and does not influence activity.

Stability

6 months

Storage

Keep enzyme frozen in aliquots at -20 centigrade in the dark.

Reconstitution

Add 1.57 ml of 50 mM Tris-HCl- 1 mM EDTA, pH 7.5 (or other buffer with EDTA) and mix. This will give 2 ml of a solution with 5 Units /ml or 2.8 μ M of active enzyme.

GENE INFORMATION

Gene Name

[Txnrd1 thioredoxin reductase 1 \[Rattus norvegicus \]](#)

Official Symbol

Txnrd1

Synonyms

Tr; thioredoxin reductase 1, cytoplasmic; NADPH-dependent thioredoxin reductase; selenoprotein oxidoreductase; thioredoxin reductase TR1

Gene ID

[58819](#)

mRNA Refseq

[NM_031614](#)

Protein Refseq

[NP_113802](#)

UniProt ID

O89049

Chromosome Location

7q13

Pathway

Folic Acid Network, organism-specific biosystem; Oxidative Stress, organism-specific biosystem; Pyrimidine metabolism, conserved biosystem

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Function

NAD(P)H oxidase activity; flavin adenine dinucleotide binding; mercury ion binding

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