

PRODUCT INFORMATION



Thioredoxin Reductase 1 (rat, recombinant; aa 3-499)

Item No. 30586

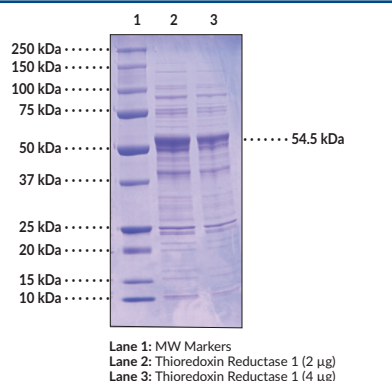
Overview and Properties

Synonyms: NADPH-dependent Thioredoxin Reductase, TrxR1, Txnrd1
Source: Active recombinant rat TrxR1 expressed in *E. coli*
Amino Acids: 3-499
Uniprot No.: O89049
Molecular Weight: 54.5 kDa
Storage: -80°C (as supplied)
Stability: ≥1 year
Purity: ≥45% estimated by SDS-PAGE
Supplied in: 50 mM Tris, pH 7.4, with 800 mM sodium chloride and 10% glycerol

Protein
Concentration: *batch specific* mg/ml
Activity: *batch specific* U/ml
Specific Activity: *batch specific* U/mg
Unit Definition: One unit is defined as the NADPH-dependent production of 2 μmol of 2-nitro-5-thiobenzoate per minute at 22°C in 50 mM potassium phosphate, pH 7.0, with 50 mM potassium chloride, 1 mM EDTA, and 0.2 mg/ml BSA. For inhibition, the selective TrxR1 inhibitor sodium aurothiomalate (ATM) was used at a concentration of 20 mM.

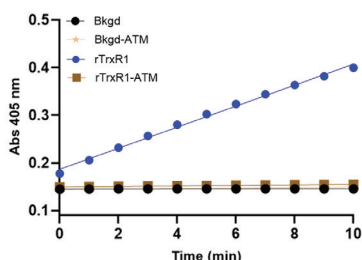
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



SDS-PAGE Analysis of Thioredoxin Reductase 1.

Representative gel image shown; actual purity may vary between each batch.



Rat Thioredoxin Reductase 1 (rTrxR1) activity determined using Cayman's Thioredoxin Reductase Colorimetric Assay Kit (Item No. 10007892).



Cayman's Thioredoxin Reductase 1 (rat, recombinant) (Item No. 30586) protein has a selenocysteine incorporated in the active site that has been confirmed by mass spectrometry. Selenocysteine (●) is incorporated in the active site at the UGA stop codon indicated in teal.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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Description

Thioredoxin reductase 1 (TrxR1) is an oxidoreductase encoded by the *TXNRD1* gene in humans and a member of the antioxidant thioredoxin system, which is involved in the maintenance of cellular thiol redox homeostasis.¹⁻³ It exists as a homodimer and contains a dimer interface domain, FAD and NADPH binding domains, an N-terminal redox catalytic site, and a C-terminal selenocysteine residue, which is essential for the catalytic activity of TrxR1.^{1,4} TrxR1 is ubiquitously expressed, localizes to the cytoplasm, and is regulated by the antioxidant transcription factor Nrf2.^{2,5} TrxR1 catalyzes the NADPH-dependent reduction of oxidized thioredoxin (Trx), restoring the disulfide reductase function of Trx, which regulates redox-sensitive transcription factors, such as NF- κ B and p53, and has roles in apoptosis and cell signaling.^{3,6} Genome-wide deletion of *Txnrd1* is embryonic lethal in mice.⁷ Increased serum TrxR1 activity is associated with reduced progression-free survival in patients with non-small cell lung cancer (NSCLC).⁸ Cayman's Thioredoxin Reductase 1 (rat, recombinant; aa 3-499) protein can be used for enzyme activity assay and Western blot (WB) applications.

References

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