

PRODUCT INFORMATION



Thioredoxin 1 (human, recombinant)

Item No. 31038

Overview and Properties

Synonyms: Trx1, Txn1
Source: Active recombinant N-terminal His-tagged thioredoxin 1 expressed in *E. coli*
Amino Acids: 2-105
Uniprot No.: P10599
Molecular Weight: 13.8 kDa
Storage: -80°C (as supplied)
Stability: ≥1 year
Purity: ≥95% estimated by SDS-PAGE
Supplied in: 50 mM Tris-HCl, pH 7.8, with 150 mM sodium chloride, 10% glycerol, 1 mM EDTA, and 0.1 mM DTT

Protein

Concentration: *batch specific* mg/ml

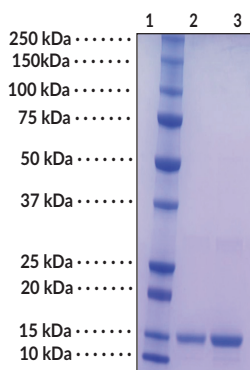
Activity: *batch specific* U/ml

Specific Activity: *batch specific* U/mg

Unit Definition: One unit is defined as the amount of enzyme required to produce 1 nmol of eosin per minute at 37°C in 50 mM Tris-HCl, pH 7.5, with 1 mM EDTA, and 0.2 mg/mL BSA containing 0.2 U/mL thioredoxin reductase, 0.25 mM NADPH, and 0.054 mg/mL eosin-labeled insulin.

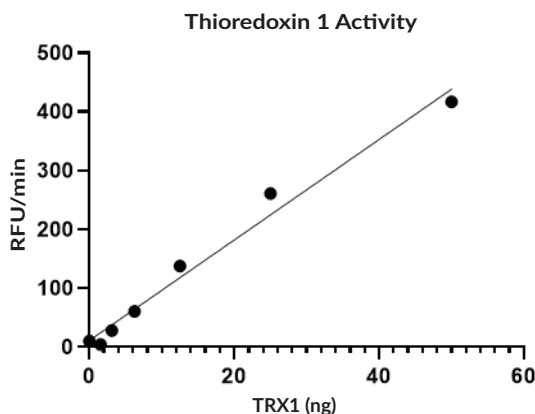
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: Thioredoxin 1 (2 µg)
Lane 3: Thioredoxin 1 (4 µg)

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



Thioredoxin 1 activity was determined using Cayman's Thioredoxin Fluorometric Activity Assay Kit (Item No. 500228) with 0.054 mg/ml eosin-labeled insulin substrate.

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 1 (Trx1) is a thiol-disulfide oxidoreductase and part of the antioxidant thioredoxin system that is involved in the maintenance of cellular thiol redox homeostasis.^{1,2,4} It is ubiquitously expressed, localizes primarily to the cytoplasm with some nuclear localization, and is upregulated in and released from cells under conditions of oxidative stress.¹⁻³ Trx1 contains two active site cysteine residues at positions 32 and 35, with additional cysteines at positions 62, 69, and 73.² During the catalytic cycle, the active site cysteines are oxidized to a disulfide upon reduction of oxidized protein disulfide substrates and are subsequently restored to their reduced state by thioredoxin reductase (TrxR) and NADPH.^{1,2} It regulates redox-sensitive transcription factors including NF- κ B, p53, and the glucocorticoid receptor, as well as inhibits apoptosis through redox-sensitive binding and regulation of apoptosis signal-regulating kinase 1 (ASK1).^{2,3} Exogenous administration of extracellular recombinant human Trx1 has anti-inflammatory effects in a variety of animal models.² Trx1 levels are increased in a variety of human primary tumors, and increased tumor levels of Trx1 are associated with decreased survival in patients with colorectal cancer.³ Cayman's Thioredoxin 1 (human, recombinant) protein can be used for enzyme activity assay and Western blot (WB) applications.

References

1. Haendeler, J. Thioredoxin-1 and posttranslational modifications. *Antioxid. Redox Signal.* **8(9-10)**, 1723-1728 (2006).
2. Watanabe, R., Nakamura, H., Masutani, H., *et al.* Anti-oxidative, anti-cancer and anti-inflammatory actions by thioredoxin 1 and thioredoxin-binding protein-2. *Pharmacol. Ther.* **127(3)**, 261-270 (2010).
3. Raffel, J., Bhattacharyya, A.K., Gallegos, A., *et al.* Increased expression of thioredoxin-1 in human colorectal cancer is associated with decreased patient survival. *J. Lab. Clin. Med.* **142(1)**, 46-51 (2003).
4. Berndt, C., Lillig, C.H., and Holmgren, A. Thiol-based mechanisms of the thioredoxin and glutaredoxin systems: Implications for diseases in the cardiovascular system. *Am. J. Physiol. Heart Circ. Physiol.* **292(3)**, H1227-H1236 (2007).

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