

PRODUCT INFORMATION



Thioredoxin 1 (*E. coli*, recombinant; oxidized form)

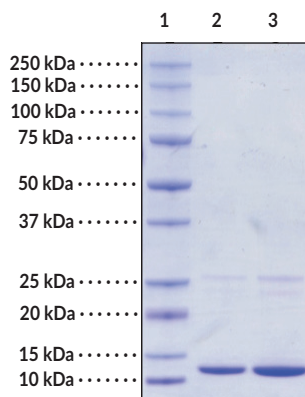
Item No. 11517

Overview and Properties

Synonyms:	Trx1, Txn1, TrxA
Source:	Active recombinant oxidized Trx1 expressed in <i>E. coli</i>
Amino Acids:	Full length
Uniprot No.:	P0AA25
Molecular Weight:	11.7 kDa
Storage:	4°C (as supplied)
Stability:	≥6 months
Purity:	batch specific (≥85% estimated by SDS-PAGE)
Supplied in:	50 mM Tris-HCl, pH 7.5, with 1 mM EDTA
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 0.2 mg/ml BSA and 1 mM EDTA containing 8.3 μM eosin-labeled insulin, 250 μM NADPH, and 0.2 U/ml thioredoxin reductase.

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

Images

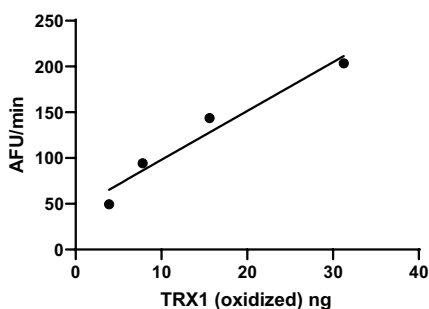


Lane 1: MW Markers
Lane 2: Thioredoxin 1 (2 μg)
Lane 3: Thioredoxin 1 (4 μg)

SDS-PAGE Analysis of Thioredoxin 1.

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

Thioredoxin 1 (oxidized) Activity



Thioredoxin 1 (oxidized) activity was determined using Thioredoxin Fluorescent Activity Assay Kit with 0.54 μg/m eosin-labeled insulin as a 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.¹⁻³ 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.^{1,2,4} 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).^{2,4} 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.⁴ Cayman's Thioredoxin 1 (*E. coli*, recombinant; oxidized form) protein can be used for enzyme assay and Western blot 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. 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).
4. 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).

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