PRODUCT INFORMATION

Thioredoxin Reductase 1 (*C. elegans*, recombinant)

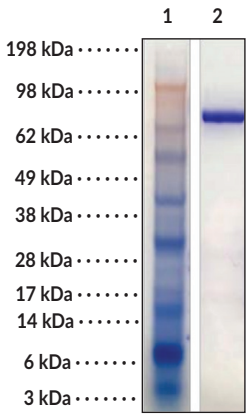
Item No. 39628

Overview and Properties

Synonyms: NADPH-dependent Thioredoxin Reductase, TrxR1, Txnrd1
Source: Active recombinant *C. elegans* TrxR1 expressed in *E. coli*
Amino Acids: 667 residues
Storage: -20°C (as supplied)
Stability: ≥1 year
Purity: ≥95% estimated by SDS-PAGE
Supplied in: TE buffer with 50% glycerol
Protein Concentration: 1 mg/ml
Unit Definition: One unit is defined as the amount of enzyme required to reduce 1 µmol DTNB per minute in 0.5 ml standard DTNB assay with 2.5 mM DTNB and 0.3 NADPH in TE buffer (50 mM Tris-HCl, 2 mM EDTA, pH 7.5)
Special Conditions: Centrifuge tube briefly before opening

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

Image



Lane 1: MW Markers
Lane 2: CeTrxR1

Coomassie stained SDS-PAGE Analysis of 10 µg CeTrxR1.

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Description

Thioredoxin reductase 1 (TrxR1) is a selenocysteine-containing oxidoreductase and the only selenoprotein in *C. elegans*.[1] It contains a dimerization 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. TrxR1 is expressed in the hypodermis, pharynx, vulva, intestine, and nervous system and localizes to the cytoplasm in *C. elegans*.[1,2] Knockout of *trxr1* sensitizes *C. elegans* to oxidative stress in a context-dependent manner and does not affect *C. elegans* lifespan, brood size, or molting.[1,3] However, double knockout of *trxr1* and the gene encoding glutathione reductase (*gsr1*) induces arrest at the molting stage, an effect that can be rescued by exogenous glutathione (GSH).[1] Increased serum TrxR1 activity is associated with reduced progression-free survival in patients with non-small cell lung cancer (NSCLC).[4] Cayman's Thioredoxin Reductase 1 (*C. elegans*, recombinant) protein can be used for enzyme activity assays.

References

1. Stenvall, J., Fierro-González, J.C., Swoboda, P., *et al.* Selenoprotein TRXR-1 and GSR-1 are essential for removal of old cuticle during molting in Caenorhabditis elegans. *Proc. Natl. Acad. Sci. USA* **108(3)**, 1064-1069 (2011).
2. Li, W., Bandyopadhyay, J., Hwaang, H.S., *et al.* Two thioredoxin reductases, trxr-1 and trxr-2, have differential physiological roles in *Caenorhabditis elegans*. *Mol. Cells* **34(2)**, 209-218 (2012).
3. Rohn, I., Raschke, S., Aschner, M., *et al.* Treatment of *Caenorhabditis elegans* with small selenium species enhances antioxidant defense systems. *Mol. Nutr. Food Res.* **63(9)**, e1801304 (2019).
4. Chen, G., Chen, Q., Zeng, F., *et al.* The serum activity of thioredoxin reductases 1 (TrxR1) is correlated with the poor prognosis in EGFR wild-type and ALK negative non-small cell lung cancer. *Oncotarget* **8(70)**, 115270-115279 (2017).

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