

Product Information

Methionine Sulfoxide Reductase A human, recombinant, histidine-tagged, expressed in *Escherichia coli*

Catalog Number **M8698**
Storage Temperature 2–8 °C

Synonyms: MsrA, methionine S-oxide reductase (S-form oxidizing), peptide-methionine sulfoxide reductase, protein-methionine-S-oxide-reductase

Product Description

Methionine (Met) residues of proteins are readily oxidized to methionine sulfoxide (MetO), especially under oxidative stress conditions. Oxidative alteration of Met to R and S Met(O) stereoisomers is reversed by methionine sulfoxide reductases: MsrA reduces S-MetO and MsrB reduces the R isomer. This may prevent irreversible oxidative protein damage and thus extend the organism's life span.¹⁻³

A series of proteins of considerable medical interest has been identified as substrates of MsrA. These include calmodulin and HIV protease.^{4,5} There is evidence of a connection between MsrA and Alzheimer's disease.⁶

This product is supplied in a solution of 50 mM Tris, pH 7.6, with 150 mM NaCl.

Purity: ≥90% (SDS-PAGE)

Note: The recombinant protein may dimerize due to intermolecular disulfide bridge formation.

Specific activity: ≥8 units/mg-protein

Unit definition: One unit will cause the oxidation of 1 μmole of NADPH per minute at 37 °C at pH 7.6.

The assay is based on the ability of MsrA to reduce methionine sulfoxide, which is measured by monitoring the level of NADPH oxidation in the presence of a thioredoxin-regenerating system.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

The product ships on wet ice and storage at 2–8 °C is recommended.

The product is stable at 2–8 °C for at least 2 years.

References

1. Ranaivoson, F.M., et al., A structural analysis of the catalytic mechanism of methionine sulfoxide reductase A from *Neisseria meningitidis*. *J. Mol. Biol.*, **377**, 268-280 (2008).
2. Grimaud, R., et al., Repair of oxidized proteins. Identification of a new methionine sulfoxide reductase. *J. Biol. Chem.*, **276**, 48915-48920 (2001).
3. Boschi-Muller, S., et al., The enzymology and biochemistry of methionine sulfoxide reductases. *Biochim. Biophys. Acta*, **1703**, 231-238 (2005).
4. Sun, H., et al., Repair of oxidized calmodulin by methionine sulfoxide reductase restores ability to activate the plasma membrane Ca-ATPase. *Biochemistry*, **38**, 105–112 (1999).
5. Davis, D.A., et al., HIV-2 protease is inactivated after oxidation at the dimer interface and activity can be partly restored with methionine sulphoxide reductase. *Biochem. J.*, **346**, 305–311 (2000).
6. Gabbita, S.P., Decrease in peptide methionine sulfoxide reductase in Alzheimer's disease brain. *J. Neurochem.*, **73**, 1660-1666 (1999).

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