

# MsrA (5B5): sc-59620

## BACKGROUND

Protein-bound methionine residues are among the most susceptible to oxidative stress by biological reactive oxygen species (ROS) such as H<sub>2</sub>O<sub>2</sub>, hydroxyl radicals and superoxide ions, which result in the formation of methionine sulfoxide, or Met(O). Methionine sulfoxide reductase (MsrA) is an enzyme that catalyzes the thioredoxin-dependent reduction of Met(O) residues in proteins and in methyl sulfoxide compounds. MsrA is an ubiquitously expressed protein which is found in organisms from yeast to man. Mammalian MsrA is most highly expressed in liver, kidney, macrophages, neutrophils, cerebellum and brain neurons. Oxidation of proteins by ROS is associated with oxidative stress and age-related diseases such as Alzheimer's disease. Recombinant mammalian MsrA retains enzymatic activity, and overexpression of the protein in yeast and human T cells increases their resistance to oxidative stress. Furthermore, MsrA activity decreases in all regions of the Alzheimer's disease brain. These findings indicate that MsrA plays an important role in protecting cells against oxidative damage and early cell death.

## REFERENCES

1. Moskovitz, J., et al. 1996. Cloning the expression of a mammalian gene involved in the reduction of methionine sulfoxide residues in proteins. *Proc. Natl. Acad. Sci. USA* 93: 2095-2099.
2. Moskovitz, J., et al. 1996. Chromosomal localization of the mammalian peptide-methionine sulfoxide reductase gene and its differential expression in various tissues. *Proc. Natl. Acad. Sci. USA* 93: 3205-3208.
3. Moskovitz, J., et al. 1998. Overexpression of peptide-methionine sulfoxide reductase in *Sacharomyces cerevisiae* and human T cells provides them with high resistance to oxidative stress. *Proc. Natl. Acad. Sci. USA* 95: 14071-14075.
4. Kuschel, L., et al. 1999. Molecular cloning and functional expression of a human peptide methionine sulfoxide reductase (hMsrA). *FEBS Lett.* 456: 17-21.
5. Gabbita, S., et al. 1999. Decrease in peptide methionine sulfoxide reductase in Alzheimer's disease brain. *J. Neurochem.* 73: 1660-1666.
6. Lowther, W., et al. 2000. Structure and mechanism of peptide methionine sulfoxide reductase, an "anti-oxidation" enzyme. *Biochemistry* 39: 13307-13312.
7. Moskovitz, J., et al. 2001. Methionine sulfoxide reductase (MsrA) is a regulator of antioxidant defense and lifespan in mammals. *Proc. Natl. Acad. Sci. USA* 98: 12920-12925.
8. Weissbach, H., et al. 2002. Peptide methionine sulfoxide reductase: structure, mechanism of action and biological function. *Arch. Biochem. Biophys.* 397: 172-178.

## CHROMOSOMAL LOCATION

Genetic locus: MSRA (human) mapping to 8p23.1; MsrA (mouse) mapping to 14 D1.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

## SOURCE

MsrA (5B5) is a mouse monoclonal antibody raised against full length MsrA of human origin.

## PRODUCT

Each vial contains IgG<sub>2b</sub> kappa light chain in 100 µl of HEPES with 0.15M NaCl, 50% glycerol, < 0.1% sodium azide, and 0.01% stabilizer protein.

## APPLICATIONS

MsrA (5B5) is recommended for detection of MsrA of mouse, rat and human origin by immunoprecipitation [1-2 µl per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution to be determined by researcher, dilution range 1:50-1:2500), immunohistochemistry (including paraffin-embedded sections) (starting dilution to be determined by researcher, dilution range 1:50-1:2500), and solid phase ELISA (starting dilution to be determined by researcher, dilution range 1:30-1:5000).

Suitable for use as control antibody for MsrA siRNA (h): sc-72126, MsrA siRNA (m): sc-72127, MsrA shRNA Plasmid (h): sc-72126-SH, MsrA shRNA Plasmid (m): sc-72127-SH, MsrA shRNA (h) Lentiviral Particles: sc-72126-V and MsrA shRNA (m) Lentiviral Particles: sc-72127-V.

Molecular Weight of MsrA: 26 kDa.

## RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 2) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz<sup>®</sup> Mounting Medium: sc-24941 or UltraCruz<sup>®</sup> Hard-set Mounting Medium: sc-359850. 3) Immunohistochemistry: use m-IgGκ BP-HRP: sc-516102 with DAB, 50X: sc-24982 and Immunohistomount: sc-45086, or Organo/Limonene Mount: sc-45087.

## SELECT PRODUCT CITATIONS

1. Rouet-Benzineb, P., et al. 2018. Effects of hypoestrogenism and/or hyperaldosteronism on myocardial remodeling in female mice. *Physiol. Rep.* 6: e13912.

## STORAGE

Store at -20° C. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) for detailed protocols and support products.