SANTA CRUZ BIOTECHNOLOGY, INC.

# MsrA (C-12): sc-21236

## BACKGROUND

Protein-bound methionine residues are among the most susceptible to oxidative stress by biological reactive oxygen species (ROS) such as $H_2O_2$, 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 a 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 cerivisae* 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. 1: 17-21.
5. Gabbita, S., et al. 1999. Decrease in peptide methionine sulfoxide reductase in Alzheimer's disease brain. J. Neurochem. 4: 1660-1666.
6. Lowther, W., et al. 2000. Structure and mechanism of peptide methionine sulfoxide reductase, an "anti-oxidation" enzyme. Biochemistry 44: 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.


## CHROMOSOMAL LOCATION

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

## SOURCE

MsrA (C-12) is an affinity purified goat polyclonal antibody raised against a peptide mapping near the C-terminus of MsrA of human origin.

## PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-21236 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

## APPLICATIONS

MsrA (C-12) is recommended for detection of MsrA of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

MsrA (C-12) is also recommended for detection of MsrA in additional species, including bovine.

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 SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

## STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

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

## PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.