

# Glutathione reductase siRNA (h): sc-44843

## BACKGROUND

Glutathione reductase, also designated Glutathione reductase mitochondrial precursor, GRase, GSR or GR, belongs to the class-I pyridine nucleotide-disulfide oxidoreductase family. The main function of the protein is to maintain high levels of reduced glutathione in the cytosol. With the concomitant oxidation of NADPH, Glutathione reductase transforms oxidized glutathione to the reduced form. Glutathione reductase, which can localize to mitochondria or to the cytoplasm, can form a disulfide-linked homodimer. The active site of the protein is a redox-active disulfide bond.

## REFERENCES

1. Staal, G.E., et al. 1969. Purification and properties of an abnormal Glutathione reductase from human erythrocytes. *Biochim. Biophys. Acta* 185: 63-69.
2. Karplus, P.A., et al. 1987. Refined structure of Glutathione reductase at 1.54 Å resolution. *J. Mol. Biol.* 195: 701-729.
3. Stoll, V.S., et al. 1997. Glutathione reductase turned into trypanothione reductase: structural analysis of an engineered change in substrate specificity. *Biochemistry* 36: 6437-6447.
4. Becker, K., et al. 1998. Enzyme inactivation through sulfhydryl oxidation by physiologic NO-carriers. *Nat. Struct. Biol.* 5: 267-271.
5. Duarte, A.I., et al. 2005. Insulin neuroprotection against oxidative stress in cortical neuron—involve ment of uric acid and Glutathione antioxidant defenses. *Free Radic. Biol. Med.* 39: 876-889.

## CHROMOSOMAL LOCATION

Genetic locus: GSR (human) mapping to 8p12.

## PRODUCT

Glutathione reductase siRNA (h) is a pool of 3 target-specific 19-25 nt siRNAs designed to knock down gene expression. Each vial contains 3.3 nmol of lyophilized siRNA, sufficient for a 10 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see Glutathione reductase shRNA Plasmid (h): sc-44843-SH and Glutathione reductase shRNA (h) Lentiviral Particles: sc-44843-V as alternate gene silencing products.

For independent verification of Glutathione reductase (h) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-44843A, sc-44843B and sc-44843C.

## STORAGE AND RESUSPENSION

Store lyophilized siRNA duplex at -20° C with desiccant. Stable for at least one year from the date of shipment. Once resuspended, store at -20° C, avoid contact with RNAses and repeated freeze thaw cycles.

Resuspend lyophilized siRNA duplex in 330 µl of the RNase-free water provided. Resuspension of the siRNA duplex in 330 µl of RNase-free water makes a 10 µM solution in a 10 µM Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

Glutathione reductase siRNA (h) is recommended for the inhibition of Glutathione reductase expression in human cells.

## SUPPORT REAGENTS

For optimal siRNA transfection efficiency, Santa Cruz Biotechnology's siRNA Transfection Reagent: sc-29528 (0.3 ml), siRNA Transfection Medium: sc-36868 (20 ml) and siRNA Dilution Buffer: sc-29527 (1.5 ml) are recommended. Control siRNAs or Fluorescein Conjugated Control siRNAs are available as 10 µM in 66 µl. Each contain a scrambled sequence that will not lead to the specific degradation of any known cellular mRNA. Fluorescein Conjugated Control siRNAs include: sc-36869, sc-44239, sc-44240 and sc-44241. Control siRNAs include: sc-37007, sc-44230, sc-44231, sc-44232, sc-44233, sc-44234, sc-44235, sc-44236, sc-44237 and sc-44238.

## GENE EXPRESSION MONITORING

Glutathione reductase (C-10): sc-133245 is recommended as a control antibody for monitoring of Glutathione reductase gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Glutathione reductase gene expression knockdown using RT-PCR Primer: Glutathione reductase (h)-PR: sc-44843-PR (20 µl, 479 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Xia, Y., et al. 2021. A novel biological activity of the Stat3 inhibitor stattic in inhibiting Glutathione reductase and suppressing the tumorigenicity of human cervical cancer cells via a ROS-dependent pathway. *Oncotargets Ther.* 14: 4047-4060.

## RESEARCH USE

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

## PROTOCOLS

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