SANTA CRUZ BIOTECHNOLOGY, INC.

Grx2 siRNA (m): sc-145788

BACKGROUND

Glutaredoxins, or thioltransferases, are cytoplasmic proteins included in the glutaredoxin family. Human mitochondrial glutaredoxin (Grx2) is the first iron-sulfur containing protein discovered in the glutaredoxin family of proteins. Instrumental in maintaining the redox environment of the cell, Grx2 maintains redox homeostasis specifically within the mitochondrion by allowing the iron-sulfur cluster to function as a redox target for the activation of Grx2 during conditions of stress, when free radicals are formed. Once oxidative stress induces apoptosis in a cell, Grx2 takes action by reducing low molecular weight proteins and disulfides. Any time that NADPH and Glutathione Reductase reside in the cell, Grx2 modulates glutathione-disulfide oxidoreductase activity. The gene that encodes human Grx2 consists of three introns and four exons, and is 10 kilobases long.

REFERENCES

1. Lundberg, M., et al. 2001. Cloning and expression of a novel human glutaredoxin (Grx2) with mitochondrial and nuclear isoforms. J. Biol. Chem. 276: 26269-26275.
2. Gladyshev, V.N., et al. 2001. Identification and characterization of a new mammalian glutaredoxin (thioltransferase), Grx2. J. Biol. Chem. 276: 30374-30380.
3. Chung, W.H., et al. 2004. Differential expression and role of two dithiol glutaredoxins Grx1 and Grx2 in *Schizosaccharomyces pombe*. Biochem. Biophys. Res. Commun. 321: 922-929.
4. Holmgren, A., et al. 2005. Thiol redox control via thioredoxin and glutaredoxin systems. Biochem. Soc. Trans. 33: 1375-1377.
5. Lundberg, M., et al. 2005. Human glutaredoxin 2 affinity tag for recombinant peptide and protein purification. Protein Expr. Purif. 45: 37-42.
6. Lillig, C.H., et al. 2005. Characterization of human glutaredoxin 2 as iron-sulfur protein: a possible role as redox sensor. Proc. Natl. Acad. Sci. USA 102: 8168-8173.
7. Berndt, C., et al. 2006. How does iron-sulfur cluster coordination regulate the activity of human glutaredoxin 2? Antioxid. Redox Signal. 9: 151-157.

CHROMOSOMAL LOCATION

Genetic locus: Glrx2 (mouse) mapping to 1 F.

PRODUCT

Grx2 siRNA (m) 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 Grx2 shRNA Plasmid (m): sc-145788-SH and Grx2 shRNA (m) Lentiviral Particles: sc-145788-V as alternate gene silencing products.

For independent verification of Grx2 (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-145788A, sc-145788B and sc-145788C.

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

Grx2 siRNA (m) is recommended for the inhibition of Grx2 expression in mouse 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Grx2 gene expression knockdown using RT-PCR Primer: Grx2 (m)-PR: sc-145788-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Wohua, Z., et al. 2019. Glutaredoxin 2 (GRX2) deficiency exacerbates high fat diet (HFD)-induced Insulin resistance, inflammation and mitochondrial dysfunction in brain injury: a mechanism involving GSK-3β. Biomed. Pharmacother. 118: 108940.

RESEARCH USE

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

PROTOCOLS

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