

# GRP 94 siRNA (h): sc-35523

## BACKGROUND

Heat shock protein (HSP) molecular chaperones are environmental stress-inducible gene products. The human HSP 90 family includes 17 genes that fall into 4 classes: HSP90AA, HSP90AB, HSP90B and TRAP. HSP 90 family members guide the normal folding, intracellular disposition and proteolytic turnover of many key regulators of cell growth, differentiation and survival. HSP 90 $\alpha$ , also designated HSP90A, HSP 86 and LPS-associated protein 2 (LAP2), is a cytosolic enhancer of inducible nitric-oxide synthase (iNOS), with chaperone activity that is important for the transcriptional activity of p53. HSP 90 $\beta$ , also designated HSP90B, HSP 84 and HSPC2, is a cytosolic protein that participates in signaling pathways with PKC  $\epsilon$  to protect cells from external damage, particularly in heat shock-mediated events. GRP 94, also known as tumor rejection antigen 1 (TRA1), ECGP and GP96, localizes to the ER, is highly expressed in BGC-823 human gastric carcinoma cells and is upregulated in human endothelial cells in response to hypoxia by HIF-1. TRAP1 (TNF receptor-associated protein 1), also designated HSP 75) is a mitochondrial matrix component that plays a role in the induction of apoptosis in response to reactive oxygen species.

## REFERENCES

1. Wu, J.M., et al. 2003. PKC  $\epsilon$  is a unique regulator for HSP 90 $\beta$  gene in heat shock response. *J. Biol. Chem.* 278: 51143-51149.
2. Whitesell, L. and Lindquist, S.L. 2005. HSP 90 and the chaperoning of cancer. *Nat. Rev. Cancer* 5: 761-772.
3. Cowen, L.E. and Lindquist, S. 2005. HSP 90 potentiates the rapid evolution of new traits: drug resistance in diverse fungi. *Science* 309: 2185-2189.

## CHROMOSOMAL LOCATION

Genetic locus: HSP90B1 (human) mapping to 12q23.3.

## PRODUCT

GRP 94 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see GRP 94 shRNA Plasmid (h): sc-35523-SH and GRP 94 shRNA (h) Lentiviral Particles: sc-35523-V as alternate gene silencing products.

For independent verification of GRP 94 (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-35523A, sc-35523B and sc-35523C.

## 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  $\mu$ l of the RNase-free water provided. Resuspension of the siRNA duplex in 330  $\mu$ l of RNase-free water makes a 10  $\mu$ M solution in a 10  $\mu$ M Tris-HCl, pH 8.0, 20 mM NaCl, 1 mM EDTA buffered solution.

## APPLICATIONS

GRP 94 siRNA (h) is recommended for the inhibition of GRP 94 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  $\mu$ M in 66  $\mu$ l. 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

GRP 94 (9G10): sc-32249 is recommended as a control antibody for monitoring of GRP 94 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).

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor GRP 94 gene expression knockdown using RT-PCR Primer: GRP 94 (h)-PR: sc-35523-PR (20  $\mu$ l, 524 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## SELECT PRODUCT CITATIONS

1. Lu, Q., et al. 2007. Inhibition of ICMT induces endothelial cell apoptosis through GRP 94. *Am. J. Respir. Cell Mol. Biol.* 37: 20-30.
2. Coope, A., et al. 2012. Chaperone insufficiency links TLR4 protein signaling to endoplasmic reticulum stress. *J. Biol. Chem.* 287: 15580-15589.
3. Wei, Q., et al. 2019. Low-concentration HCP1 inhibits apoptosis in vascular endothelial cells. *Biochem. Biophys. Res. Commun.* 511: 92-98.
4. Zhang, B., et al. 2019. GRP94 rewires and buffers the FLT3-ITD signaling network and promotes survival of acute myeloid leukemic stem cells. *Haematologica* 104: e229.
5. Vidal, R.L., et al. 2021. Enforced dimerization between XBP1s and ATF6f enhances the protective effects of the UPR in models of neurodegeneration. *Mol. Ther.* 29: 1862-1882.
6. Ren, H., et al. 2021. Identification of a new autophagy inhibitor targeting lipid droplets in vascular endothelial cells. *Biochem. Biophys. Res. Commun.* 571: 195-200.
7. Hromas, R., et al. 2022. BRCA1 mediates protein homeostasis through the ubiquitination of PERK and IRE1. *iScience* 25: 105626.

## RESEARCH USE

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