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# GBP1 siRNA (m): sc-41707

## BACKGROUND

GBP1 (guanylate binding protein 1) is a 592 amino acid protein member of the GTPase protein family and is able to bind specifically to guanine nucleotides such as GMP, GDP and GTP. GMP is hydrolyzed to GTP in two consecutive cleavage steps, both of which are carried out by GBP1. Localized to the cytoplasm, GBP1 is expressed in endothelial cells of the vascular system and is induced by INF- $\gamma$  during macrophage induction. GBP1 is thought to regulate the expression of MMP-1, which mediates the proliferation and invasiveness of endothelial cells. GBP1 plays a key role in regulating inflammatory cytokines and provides protection against vesicular stomatitis and encephalomyocarditis viruses. GBP1 expression is highly induced in the vessels of skin diseases such as psoriasis and Kaposi's sarcoma, making it a novel cellular activation marker that characterizes inflammatory cytokines of endothelial cells.

## REFERENCES

1. Anderson, S.L., et al. 1999. Interferon-induced guanylate binding protein-1 (GBP-1) mediates an antiviral effect against vesicular stomatitis virus and encephalomyocarditis virus. *Virology* 256: 8-14.
2. Anderson, S.L., et al. 1999. Genomic organization and chromosomal localization of a new member of the murine interferon-induced guanylate-binding protein family. *J. Interferon Cytokine Res.* 19: 487-494.
3. Praefcke, G.J., et al. 1999. Nucleotide-binding characteristics of human guanylate-binding protein 1 (hGBP1) and identification of the third GTP-binding motif. *J. Mol. Biol.* 292: 321-332.
4. Prakash, B., et al. 2000. Structure of human guanylate-binding protein 1 representing a unique class of GTP-binding proteins. *Nature* 403: 567-571.
5. Guenzi, E., et al. 2001. The helical domain of GBP-1 mediates the inhibition of endothelial cell proliferation by inflammatory cytokines. *EMBO J.* 20: 5568-5577.
6. Lubeseder-Martellato, C., et al. 2002. Guanylate-binding protein-1 expression is selectively induced by inflammatory cytokines and is an activation marker of endothelial cells during inflammatory diseases. *Am. J. Pathol.* 161: 1749-1759.
7. Guenzi, E., et al. 2003. The guanylate binding protein-1 GTPase controls the invasive and angiogenic capability of endothelial cells through inhibition of MMP-1 expression. *EMBO J.* 22: 3772-3782.
8. Ghosh, A., et al. 2006. How guanylate-binding proteins achieve assembly-stimulated processive cleavage of GTP to GMP. *Nature* 440: 101-104.
9. Kunzelmann, S., et al. 2006. Transient kinetic investigation of GTP hydrolysis catalyzed by interferon- $\gamma$ -induced hGBP1 (human guanylate binding protein 1). *J. Biol. Chem.* 281: 28627-28635.

## CHROMOSOMAL LOCATION

Genetic locus: *Gbp1* (mouse) mapping to 3 H1.

## PROTOCOLS

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

## PRODUCT

GBP1 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  $\mu$ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see GBP1 shRNA Plasmid (m): sc-41707-SH and GBP1 shRNA (m) Lentiviral Particles: sc-41707-V as alternate gene silencing products.

For independent verification of GBP1 (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-41707A, sc-41707B and sc-41707C.

## 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

GBP1 siRNA (m) is recommended for the inhibition of GBP1 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  $\mu$ 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.

## RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor GBP1 gene expression knockdown using RT-PCR Primer: GBP1 (m)-PR: sc-41707-PR (20  $\mu$ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

## RESEARCH USE

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