

GPR40 siRNA (m): sc-145734

BACKGROUND

G protein-coupled receptors provide attractive targets for drug therapy due to the sheer size and diversity of ligands within this receptor family. G protein-coupled receptor 40 (GPR40) functions as a cell-surface receptor for long-chain free fatty acids (FFAs). FFAs provide an important energy source, but also function as signaling molecules in various pathways, notably the process of Insulin secretion. In pancreatic tissue, the interaction of long chain FFAs with GPR40 amplifies glucose-stimulated Insulin secretion from β cells, suggesting a possible role for GPR40 in the treatment of diabetes associated with Insulin-deficiency. Specifically, the Arg211His polymorphism in the GPR40 gene may contribute to the variation of Insulin secretory capacity in Japanese men. Also, GPR40 may be involved in the control of breast cancer cell growth by fatty acids and, therefore, provide a link between fat and cancer.

REFERENCES

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2. Briscoe, C.P., et al. 2003. The orphan G protein-coupled receptor GPR40 is activated by medium and long chain fatty acids. *J. Biol. Chem.* 278: 11303-11311.
3. Itoh, Y., et al. 2003. Free fatty acids regulate Insulin secretion from pancreatic β cells through GPR40. *Nature* 422: 173-176.
4. Lee, D.K., et al. 2003. Continued discovery of ligands for G protein-coupled receptors. *Life Sci.* 74: 293-297.
5. Yonezawa, T., et al. 2004. Existence of GPR40 functioning in a human breast cancer cell line, MCF7. *Biochem. Biophys. Res. Commun.* 314: 805-809.
6. Brown, A.J., et al. 2005. A family of fatty acid binding receptors. *DNA Cell Biol.* 24: 54-61.
7. Hamid, Y.H., et al. 2005. Studies of relationships between variation of the human G protein-coupled receptor 40 gene and type 2 diabetes and Insulin release. *Diabet. Med.* 22: 74-80.
8. Hardy, S., et al. 2005. Oleate promotes the proliferation of breast cancer cells via the G protein-coupled receptor GPR40. *J. Biol. Chem.* 280: 13285-13291.

CHROMOSOMAL LOCATION

Genetic locus: Ffar1 (mouse) mapping to 7 B1.

PRODUCT

GPR40 siRNA (m) is a pool of 2 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see GPR40 shRNA Plasmid (m): sc-145734-SH and GPR40 shRNA (m) Lentiviral Particles: sc-145734-V as alternate gene silencing products.

For independent verification of GPR40 (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-145734A and sc-145734B.

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

APPLICATIONS

GPR40 siRNA (m) is recommended for the inhibition of GPR40 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 μ M in 66 μ 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 GPR40 gene expression knockdown using RT-PCR Primer: GPR40 (m)-PR: sc-145734-PR (20 μ l, 555 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Fujii, K., et al. 2017. Pro-metastatic intracellular signaling of the elaidic *trans* fatty acid. *Int. J. Oncol.* 50: 85-92.
2. Finetto, C., et al. 2019. Presenting ERIK, the TMS phantom: a novel device for training and testing operators. *Brain Stimul.* 12: 1095-1097.
3. Lu, Z., et al. 2021. GPR40 deficiency is associated with hepatic FAT/CD36 upregulation, steatosis, inflammation, and cell injury in C57BL/6 mice. *Am. J. Physiol. Endocrinol. Metab.* 320: E30-E42.

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.