SANTA CRUZ BIOTECHNOLOGY, INC.

GPR40 siRNA (h): sc-105408

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

1. Sawzdargo, M., et al. 1997. A cluster of four novel human G protein-coupled receptor genes occurring in close proximity to CD22 gene on chromosome 19q13.1. Biochem. Biophys. Res. Commun. 239: 543-547.
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.
9. Ogawa, T., et al. 2005. GPR40 gene Arg211His polymorphism may contribute to the variation of Insulin secretory capacity in Japanese men. Metab. Clin. Exp. 54: 296-299.

CHROMOSOMAL LOCATION

Genetic locus: FFAR1 (human) mapping to 19q13.12.

PRODUCT

GPR40 siRNA (h) is a target-specific 19-25 nt siRNA 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 GPR40 shRNA Plasmid (h): sc-105408-SH and GPR40 shRNA (h) Lentiviral Particles: sc-105408-V as alternate gene silencing products.

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

GPR40 siRNA (h) is recommended for the inhibition of GPR40 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor GPR40 gene expression knockdown using RT-PCR Primer: GPR40 (h)-PR: sc-105408-PR (20 µl, 421 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Gong, Z., et al. 2014. G protein-coupled receptor 120 signaling regulates ghrelin secretion *in vivo* and *in vitro*. Am. J. Physiol. Endocrinol. Metab. 306: E28-E35.
2. Lu, Z., et al. 2015. GPR40/FFA1 and neutral sphingomyelinase are involved in palmitate-boosted inflammatory response of microvascular endothelial cells to LPS. Atherosclerosis 240: 163-173.
3. Fujii, K., et al. 2017. Pro-metastatic intracellular signaling of the elaidic *trans* fatty acid. Int. J. Oncol. 50: 85-92.
4. Krizhanovskii, C., et al. 2017. Addition of exogenous sodium palmitate increases the IAPP/Insulin mRNA ratio via GPR40 in human EndoC-βH1 cells. Ups. J. Med. Sci. 122: 149-159.

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.