

GPR40 (Y-17): sc-28416

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 beta 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. Lee, D.K., et al. 2003. Continued discovery of ligands for G protein-coupled receptors. *Life Sci.* 74: 293-297.
4. Itoh, Y., et al. 2003. Free fatty acids regulate insulin secretion from pancreatic β cells through GPR40. *Nature* 422: 173-176.
5. Yonezawa, T., et al. 2004. Existence of GPR40 functioning in a human breast cancer cell line, MCF-7. *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. Ogawa, T., et al. 2005. GPR40 gene Arg211His polymorphism may contribute to the variation of insulin secretory capacity in Japanese men. *Metabolism* 54: 296-299.

CHROMOSOMAL LOCATION

Genetic locus: FFAR1 (human) mapping to 19q13.12; Ffar1 (mouse) mapping to 7 B1.

SOURCE

GPR40 (Y-17) is an affinity purified goat polyclonal antibody raised against a peptide mapping within an internal cytoplasmic domain of GPR40 of human origin.

RESEARCH USE

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

PRODUCT

Each vial contains 200 μ g IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-28416 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

GPR40 (Y-17) is recommended for detection of GPR40 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

GPR40 (Y-17) is also recommended for detection of GPR40 in additional species, including canine, bovine and porcine.

Suitable for use as control antibody for GPR40 siRNA (h): sc-105408, GPR40 siRNA (m): sc-145734, GPR40 shRNA Plasmid (h): sc-105408-SH, GPR40 shRNA Plasmid (m): sc-145734-SH, GPR40 shRNA (h) Lentiviral Particles: sc-105408-V and GPR40 shRNA (m) Lentiviral Particles: sc-145734-V.

Molecular Weight of GPR40: 31 kDa.

Positive Controls: MCF7 whole cell lysate: sc-2206 or mouse pancreas extract: sc-364244.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

SELECT PRODUCT CITATIONS

1. Zhang, Y., et al. 2007. The role of G protein-coupled receptor 40 in lipopapoptosis in mouse β cell line NIT-1. *J. Mol. Endocrinol.* 38: 651-661.
2. Li, Y., et al. 2010. miR-375 enhances palmitate-induced lipopapoptosis in insulin-secreting NIT-1 cells by repressing myotrophin (V1) protein expression. *Int. J. Clin. Exp. Pathol.* 3: 254-264.
3. Li, Y., et al. 2013. Gustducin couples fatty acid receptors to GLP-1 release in colon. *Am. J. Physiol. Endocrinol. Metab.* 304: E651-E660.
4. Wauquier, F., et al. 2013. The free fatty acid receptor G protein-coupled receptor 40 (GPR40) protects from bone loss through inhibition of osteoclast differentiation. *J. Biol. Chem.* 288: 6542-6551.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.