SANTA CRUZ BIOTECHNOLOGY, INC.

TGR5 siRNA (h): sc-61678

BACKGROUND

The G protein-coupled receptor TGR5 is a 330-amino acid protein that is almost universally expressed in human tissues including heart, skeletal muscle, spleen, kidney, liver, small intestine, placenta, and leukocytes, but not in brain, colon (without mucosa), thymus, or lung. TGR5 is sensitive to bile acids and responds through a significant mechanism that coordinates energy homeostasis. Bile acids activate mitogen-activated protein (MAP) kinase pathways, specifically induce TGR5 internalization, promote an increase of guanosine 5'-O-3-thio-triphosphate binding in membrane fractions, and cause rapid intracellular cAMP production. Bile acids also provoke TGR5 to suppress macrophage functions. TGR5-controlled signaling pathways may be good candidates for drug targets to treat common metabolic diseases, such as obesity, type II diabetes, hyperlipidemia, and atherosclerosis.

REFERENCES

1. Maruyama, T., et al. 2002. Identification of membrane-type receptor for bile acids (M-BAR). Biochem. Biophys. Res. Commun. 298: 714-719.
2. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 610147. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
3. Kawamata, Y., et al. 2003. A G protein-coupled receptor responsive to bile acids. J. Biol. Chem. 278: 9435-9440.
4. Katsuma, S., et al. 2005. Bile acids promote glucagon-like peptide-1 secretion through TGR5 in a murine enteroendocrine cell line STC-1. Biochem. Biophys. Res. Commun. 329: 386-390.

CHROMOSOMAL LOCATION

Genetic locus: GPBAR1 (human) mapping to 2q35.

PRODUCT

TGR5 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 µM solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see TGR5 shRNA Plasmid (h): sc-61678-SH and TGR5 shRNA (h) Lentiviral Particles: sc-61678-V as alternate gene silencing products.

For independent verification of TGR5 (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-61678A, sc-61678B and sc-61678C.

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

TGR5 siRNA (h) is recommended for the inhibition of TGR5 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 TGR5 gene expression knockdown using RT-PCR Primer: TGR5 (h)-PR: sc-61678-PR (20 µl, 510 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Hong, J., et al. 2010. Role of a novel bile acid receptor TGR5 in the development of oesophageal adenocarcinoma. Gut 59: 170-180.
2. Li, S., et al. 2014. Therapeutic role of ursolic acid on ameliorating hepatic steatosis and improving metabolic disorders in high-fat diet-induced non-alcoholic fatty liver disease rats. PLoS ONE 9: e86724.
3. Jang, E.S., et al. 2014. Sodium taurocholate cotransporting polypeptide mediates dual actions of deoxycholic acid in human hepatocellular carcinoma cells: enhanced apoptosis versus growth stimulation. J. Cancer Res. Clin. Oncol. 140: 133-144.
4. Li, D. and Cao, W. 2016. Bile acid receptor TGR5, NADPH oxidase NOX5-S and CREB mediate bile acid-induced DNA damage in Barrett's esophageal adenocarcinoma cells. Sci. Rep. 6: 31538.
5. Chen, Y., et al. 2019. Genistein protects against DSS-induced colitis by inhibiting NLRP3 inflammasome via TGR5-cAMP signaling. Int. Immunopharmacol. 71: 144-154.
6. Zhuo, W., et al. 2019. Activation of G protein-coupled bile acid receptor Gpbar1 (TGR5) inhibits degradation of type II collagen and aggrecan in human chondrocytes. Eur. J. Pharmacol. 856: 172387.
7. Chaudhari, S.N., et al. 2021. Bariatric surgery reveals a gut-restricted TGR5 agonist with anti-diabetic effects. Nat. Chem. Biol. 17: 20-29.
8. Xie, J., et al. 2023. *Akkermansia muciniphila* protects mice against an emerging tick-borne viral pathogen. Nat. Microbiol. 8: 91-106.

RESEARCH USE

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