

SGLT-2 siRNA (h): sc-106547

BACKGROUND

Glucose is the main source of energy for mammalian cells and its entry is mediated by various transporters. This process involves seven facilitative (GLUT-1 to -7) and two concentrative glucose transporters (SGLT-1, SGLT-2) and a sensor (SGLT-3). The SGLT family members use the electrochemical gradient of two sodium ions to transport one glucose molecule. The mRNA of SGLTs increase steadily from the fetal period to maturity along with an increase in their functional activity. SGLT-1 is responsible for the uptake of the dietary sugars glucose and galactose from the intestinal lumen, while SGLT-3 is involved in the detection of luminal glucose only. Both the sodium glucose co-transporters SGLT-1 and SGLT-2 are expressed in kidneys. Mutations in the gene encoding SGLT-2 result in familial renal glucosuria (FRG), an isolated disorder of proximal tubular glucose transport, characterized by abnormal urinary glucose excretion in the presence of normal blood glucose levels.

REFERENCES

1. Turk, E., et al. 1993. Assignment of the human Na⁺/glucose cotransporter gene SGLT-1 to chromosome 22q13.1. *Genomics* 17: 752-754.
2. Yang, Q., et al. 2000. Expression characteristics and relevance of sodium glucose cotransporter-1 in mammalian renal tubulogenesis. *Am. J. Physiol. Renal Physiol.* 279: F765-F777.
3. Wallner, E.L., et al. 2001. Status of glucose transporters in the mammalian kidney and renal development. *Ren. Fail.* 23: 301-310.
4. Stumpel, F., et al. 2001. Normal kinetics of intestinal glucose absorption in the absence of GLUT2: evidence for a transport pathway requiring glucose phosphorylation and transfer into the endoplasmic reticulum. *Proc. Natl. Acad. Sci. USA* 98: 11330-11335.

CHROMOSOMAL LOCATION

Genetic locus: SLC5A2 (human) mapping to 16p11.2.

PRODUCT

SGLT-2 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 μ M solution once resuspended using protocol below. Suitable for 50-100 transfections. Also see SGLT-2 shRNA Plasmid (h): sc-106547-SH and SGLT-2 shRNA (h) Lentiviral Particles: sc-106547-V as alternate gene silencing products.

For independent verification of SGLT-2 (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-106547A, sc-106547B and sc-106547C.

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

SGLT-2 siRNA (h) is recommended for the inhibition of SGLT-2 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 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.

GENE EXPRESSION MONITORING

SGLT-2 (D-6): sc-393350 is recommended as a control antibody for monitoring of SGLT-2 gene expression knockdown by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) or immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500).

To ensure optimal results, the following support reagents are recommended:

- 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker[™] Molecular Weight Standards: sc-2035, UltraCruz[®] Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz[®] Mounting Medium: sc-24941 or UltraCruz[®] Hard-set Mounting Medium: sc-359850.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor SGLT-2 gene expression knockdown using RT-PCR Primer: SGLT-2 (h)-PR: sc-106547-PR (20 μ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Kim, J.H., et al. 2020. Effect of dapagliflozin, a sodium-glucose co-transporter-2 inhibitor, on gluconeogenesis in proximal renal tubules. *Diabetes Obes. Metab.* 22: 373-382.
2. Komatsu, S., et al. 2020. SGLT2 inhibitor ipragliflozin attenuates breast cancer cell proliferation. *Endocr. J.* 67: 99-106.

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.