SANTA CRUZ BIOTECHNOLOGY, INC.

SGLT-1 siRNA (m): sc-41297

BACKGROUND

Glucose is the main source of energy for mammalian cells and its entry is mediated by various transporters. Seven facilitative (GLUT-1 to -7) and 2 concentrative glucose transporters (SGLT-1 and -2) are identified. The Na^+/glucose cotransporter gene SGLT-1 encodes the primary carrier protein responsible for the uptake of the dietary sugars glucose and galactose from the intestinal lumen. The glycoprotein is localized in the brush border of the intestinal epithelium and contains 12 membrane spans. SGLT-1 uses the electrochemical gradient of two sodium ions to transport one glucose molecule. Both the sodium glucose co-transporters SGLT-1 and -2 are also expressed in kidneys. The mRNA of SGLTs increases steadily from the fetal period to maturity along with the increase in their functional activity, i.e., glucose uptake. The interaction between a nucleocytoplasmic protein and a regulatory uridine-rich sequence in the 3'-UTR is important for cAMP-mediated SGLT-1 message stabilization. Defects in SGLT-1 cause Glucose-Galactose Malabsorption (GGM), resulting in neonatal onset of diarrhea, which results in death unless sugars are removed from the diet.

REFERENCES

1. Turk, E., et al. 1993. Assignment of the human Na^+/glucose co-transporter gene SGLT1 to chromsome 22q13.1. Genomics 17: 752-754.
2. Martin, M.G., et al. 1996. Defects in Na^+/glucose co-transporter (9SGLT1) trafficking and function cause glucose-galactose malabsorption. Nat. Genet. 12: 216-220.
3. Lee, W.Y., et al. 2000. Cyclic nucleotide regulation of Na^+/glucose co-transporter (SGLT1) mRNA stability. Interaction of a nucleocytoplasmic protein with a regulatory domain in the 3'-untranslated region critical for stabilization. J. Biol. Chem. 275: 33998-34008.
4. Yang, Q., et al. 2000. Expression characteristics and relevance of sodium glucose co-transporter-1 in mammalian renal tubulogenesis. Am. J. Physiol. Renal Physiol. 279: F765-F777.
5. Wallner, E.I., et al. 2001. Status of glucose transporters in the mammalian kidney and renal development. Ren. Fail. 23: 301-310.
6. 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. PNAS 98: 11330-11335.

CHROMOSOMAL LOCATION

Genetic locus: Slc5a1 (mouse) mapping to 5 B1.

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.

PRODUCT

SGLT-1 siRNA (m) 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 SGLT-1 shRNA Plasmid (m): sc-41297-SH and SGLT-1 shRNA (m) Lentiviral Particles: sc-41297-V as alternate gene silencing products.

For independent verification of SGLT-1 (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-41297A, sc-41297B and sc-41297C.

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

SGLT-1 siRNA (m) is recommended for the inhibition of SGLT-1 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 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 SGLT-1 gene expression knockdown using RT-PCR Primer: SGLT-1 (m)-PR: sc-41297-PR (20 µl, 494 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.