SANTA CRUZ BIOTECHNOLOGY, INC.

Glut1 siRNA (h): sc-35493

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The Power to Question

BACKGROUND

Glucose is fundamental to the metabolism of mammalian cells. Its passage across cell membranes is mediated by a family of transporters termed glucose transporters or Gluts. In adipose and muscle tissue, Insulin stimulates a rapid and dramatic increase in glucose uptake, which is largely due to the redistribution of the Insulin-inducible glucose transporter, Glut4. In response to Insulin, Glut4 is quickly shuttled from an intracellular storage site to the plasma membrane, where it binds glucose. In contrast, the ubiquitously expressed glucose transporter Glut1 is constitutively targeted to the plasma membrane, and shows a much less dramatic translocation in response to Insulin. Glut1 and Glut4 are 12-pass transmembrane proteins (12TM) whose carboxy-termini may dictate their cellular localization. Aberrant Glut4 expression has been suggested to contribute to such maladies as obesity and diabetes. Glut4 null mice have shown that while functional Glut4 protein is not required for maintaining normal glucose levels, it is necessary for sustained growth, normal cellular glucose, fat metabolism and prolonged longevity.

REFERENCES

1. Fischbarg, J., et al. 1993. Evidence that facilitative glucose transporters may fold as β-barrels. Proc. Natl. Acad. Sci. USA 90: 11658-11662.
2. Livingstone, C., et al. 1995. Hypothalamic Glut4 expression: a glucose- and Insulin-sensing mechanism? Mol. Endocrinol. 107: 67-70.

CHROMOSOMAL LOCATION

Genetic locus: SLC2A1 (human) mapping to 1p34.2.

PRODUCT

Glut1 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 Glut1 shRNA Plasmid (h): sc-35493-SH and Glut1 shRNA (h) Lentiviral Particles: sc-35493-V as alternate gene silencing products.

For independent verification of Glut1 (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-35493A, sc-35493B and sc-35493C.

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

Glut1 siRNA (h) is recommended for the inhibition of Glut1 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.

GENE EXPRESSION MONITORING

Glut1 (A-4): sc-377228 is recommended as a control antibody for monitoring of Glut1 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).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor Glut1 gene expression knockdown using RT-PCR Primer: Glut1 (h)-PR: sc-35493-PR (20 µl, 590 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Pereira, P.M., et al. 2016. Mitochondria-targeted photodynamic therapy with a galactodendritic chlorin to enhance cell death in resistant bladder cancer cells. Bioconjug. Chem. 27: 2762-2769.
2. Sun, X.F., et al. 2017. High-concentration glucose enhances invasion in invasive ductal breast carcinoma by promoting Glut1/MMP2/MMP9 axis expression. Oncol. Lett. 13: 2989-2995.
3. Gong, L., et al. 2018. A functional interplay between Δ133p53 and ΔNp63 in promoting glycolytic metabolism to fuel cancer cell proliferation. Oncogene 37: 2150-2164.
4. Zhao, H., et al. 2019. Glucose transporter 1 promotes the malignant phenotype of non-small cell lung cancer through Integrin β1/Src/FAK signaling. J. Cancer 10: 4989-4997.
5. Kim, H., et al. 2020. Silencing of CD133 inhibits Glut1-mediated glucose transport through downregulation of the HER3/Akt/mTOR pathway in colon cancer. FEBS Lett. 594: 1021-1035.
6. Liu, S., et al. 2021. Mutant KRAS downregulates the receptor for leukemia inhibitory factor (LIF) to enhance a signature of glycolysis in pancreatic cancer and lung cancer. Mol. Cancer Res. 19: 1283-1295.
7. Liu, H., et al. 2021. Long non-coding RNA SLC2A1-AS1 induced by GLI3 promotes aerobic glycolysis and progression in esophageal squamous cell carcinoma by sponging miR-378a-3p to enhance Glut1 expression. J. Exp. Clin. Cancer Res. 40: 287.

RESEARCH USE

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