SANTA CRUZ BIOTECHNOLOGY, INC.

GALK2 siRNA (h): sc-90002

BACKGROUND

Galactose kinase (GALK1), also often designated galactokinase, is important in the first step of the galactose metabolism pathway. GALK1, which belongs to the GHMP kinase family of proteins, is a crucial enzyme for galactose metabolism, specifically converting α-D-galactose to galactose 1-phosphate. Defects in the gene encoding GALK1 can cause galactosemia II, an autosomal recessive disorder characterized by congenital cataracts during infancy, often within the first two weeks of life. In the adult population, galactosemia II can cause presenile cataracts that are secondary to accumulation of galactitol in the lens of the eye. A second gene, GALK2, encodes an enzyme with greater activity against GalNAc than galactose. GALK2 has been implicated in the salvage pathway for the reutilization of free GalNAc derived from the degradation of complex carbohydrates.

REFERENCES

1. Hunter, M., et al. 2001. Novel mutations in the GALK1 gene in patients with galactokinase deficiency. Hum. Mutat. 17: 77-78.
2. Okano, Y., et al. 2001. A genetic factor for age-related cataract: identification and characterization of a novel galactokinase variant, "Osaka", in Asians. Am. J. Hum. Genet. 68: 1036-1042.
3. Timson, D.J., et al. 2003. Functional analysis of disease-causing mutations in human galactokinase. Eur. J. Biochem. 270: 1767-1774.
4. Holden, H.M., et al. 2004. Galactokinase: structure, function and role in type II galactosemia. Cell. Mol. Life Sci. 61: 2471-2484.
5. Ross, K.L., et al. 2004. Differential roles of the Leloir pathway enzymes and metabolites in defining galactose sensitivity in yeast. Mol. Genet. Metab. 83: 103-116.
6. Sangiuolo, F., et al. 2004. Biochemical characterization of two GALK1 mutations in patients with galactokinase deficiency. Hum. Mutat. 23: 396.
7. Thoden, J.B., et al. 2005. Molecular structure of human galactokinase: implications for type II galactosemia. J. Biol. Chem. 280: 9662-9670.
8. Thoden, J.B., et al. 2005. The molecular architecture of human N-acetylgalactosamine kinase. J. Biol. Chem. 280: 32784-32791.

CHROMOSOMAL LOCATION

Genetic locus: GALK2 (human) mapping to 15q21.1.

PRODUCT

GALK2 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 GALK2 shRNA Plasmid (h): sc-90002-SH and GALK2 shRNA (h) Lentiviral Particles: sc-90002-V as alternate gene silencing products.

For independent verification of GALK2 (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-90002A, sc-90002B and sc-90002C.

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

GALK2 siRNA (h) is recommended for the inhibition of GALK2 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 GALK2 gene expression knockdown using RT-PCR Primer: GALK2 (h)-PR: sc-90002-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Campbell, S., et al. 2021. Glutamine deprivation triggers NAGK-dependent hexosamine salvage. Elife 10: e62644.

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.