

HACL1 siRNA (h): sc-78507

BACKGROUND

HACL1 (2-hydroxyacyl-CoA lyase 1) is also known as HPCL or 2-HPCL (2-hydroxyphytanoyl-CoA lyase) and is a 578 amino acid protein. HACL1 is abundantly expressed in liver, and is also expressed in kidney, heart and skeletal muscle, where it is localized to peroxisomes. HACL1 functions in lipid metabolism as well as fatty acid metabolism and is able to form homotetramers. Phytol, a breakdown product of chlorophyll, is converted into phytanic acid which undergoes α -oxidation. Through a series of reactions during α -oxidation, phytanic acid is converted into 2-hydroxyphytanoyl-CoA which reacts with HACL1 to yield pristanal and formyl-CoA. The α -oxidation of fatty acids by HACL1, including 3-methyl-branched fatty acids and 2-hydroxylated straight chain fatty acids, promotes carbon-carbon cleavage resulting in a reaction that forms formyl-CoA and a 2-methyl-branched fatty aldehyde. HACL1 is a member of the TPP (thiamine pyrophosphate) enzyme family and TPP is thought to be a cofactor of HACL1 during α -oxidation. Thiamine depletion, present in patients with severe malnutrition, chronic alcoholism and AIDS, can lead to Wernicke-Korsakoff syndrome and affects α -oxidation by lowering the level and activity of HACL1.

REFERENCES

- Jansen, G.A., et al. 1999. Phytanic acid α -oxidation: identification of 2-hydroxyphytanoyl-CoA lyase in rat liver and its localisation in peroxisomes. *Biochim. Biophys. Acta* 1440: 176-182.
- Foulon, V., et al. 1999. Purification, molecular cloning, and expression of 2-hydroxyphytanoyl-CoA lyase, a peroxisomal thiamine pyrophosphate-dependent enzyme that catalyzes the carbon-carbon bond cleavage during α -oxidation of 3-methyl-branched fatty acids. *Proc. Natl. Acad. Sci. USA* 96: 10039-10044.
- Jansen, G.A., et al. 2001. Identification of pristanal dehydrogenase activity in peroxisomes: conclusive evidence that the complete phytanic acid α -oxidation pathway is localized in peroxisomes. *Biochem. Biophys. Res. Commun.* 283: 674-679.
- Wierzbicki, A.S., et al. 2002. Refsum's disease: a peroxisomal disorder affecting phytanic acid α -oxidation. *J. Neurochem.* 80: 727-735.
- Wanders, R.J., et al. 2003. Phytanic acid α -oxidation, new insights into an old problem: a review. *Biochim. Biophys. Acta* 1631: 119-135.
- Foulon, V., et al. 2005. Breakdown of 2-hydroxylated straight chain fatty acids via peroxisomal 2-hydroxyphytanoyl-CoA lyase: a revised pathway for the α -oxidation of straight chain fatty acids. *J. Biol. Chem.* 280: 9802-9812.
- Sniekers, M., et al. 2006. Thiamine pyrophosphate: an essential cofactor for the α -oxidation in mammals—implications for thiamine deficiencies? *Cell. Mol. Life Sci.* 63: 1553-1563.
- Hashimoto, T., et al. 2006. Polyunsaturated fats attenuate the dietary phytol-induced increase in hepatic fatty acid oxidation in mice. *J. Nutr.* 136: 882-886.

CHROMOSOMAL LOCATION

Genetic locus: HACL1 (human) mapping to 3p25.1.

PRODUCT

HACL1 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 HACL1 shRNA Plasmid (h): sc-78507-SH and HACL1 shRNA (h) Lentiviral Particles: sc-78507-V as alternate gene silencing products.

For independent verification of HACL1 (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-78507A, sc-78507B and sc-78507C.

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

HACL1 siRNA (h) is recommended for the inhibition of HACL1 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.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor HACL1 gene expression knockdown using RT-PCR Primer: HACL1 (h)-PR: sc-78507-PR (20 μ l). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

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.