SANTA CRUZ BIOTECHNOLOGY, INC.

ACSL4 siRNA (h): sc-60619

BACKGROUND

Acyl-CoA synthetases, also known as long-chain fatty-acid CoA synthases (FACL) or palmitoyl-CoA ligases, include ACSL1-6, which are all single-pass membrane proteins localizing to the mitochondrion, microsome or peroxisome. ACSL proteins are important for synthesis of cellular lipids and for β-oxidation degradation. Specifically, ACSL proteins catalyze the activation of long-chain fatty acids to acyl-CoAs, which can be metabolized to form CO_2, triacylglycerol (TAG), phospholipids (PL) and cholesteryl esters (CE). ACSL3 preferentially utilizes laurate, myristate, arachidonate and eicosapentaenoate among saturated and unsaturated long chain fatty acids. ACSL3 is expressed as two isoforms in various tissues, including brain, heart, placenta, prostate, skeletal muscle, testis and thymus. ACSL4 preferentially utilizes arachidonate and is abundant in steroidogenic tissues. ACSL4 may modulate female fertility and uterine prostaglandin production.

REFERENCES

1. Fujino, T., et al. 1996. Molecular characterization and expression of rat acyl-CoA synthetase 3. J. Biol. Chem. 271: 16748-16752.
2. Fujino, T., et al. 1997. Alternative translation initiation generates acyl-CoA synthetase 3 isoforms with heterogeneous amino termini. J. Biochem. 122: 212-216.
3. Muoio, D.M., et al. 2000. Acyl-CoAs are functionally channeled in liver: potential role of acyl-CoA synthetase. Am. J. Physiol. Endocrinol. Metab. 279: E1366-E1373.

CHROMOSOMAL LOCATION

Genetic locus: ACSL4 (human) mapping to Xq23.

PRODUCT

ACSL4 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 ACSL4 shRNA Plasmid (h): sc-60619-SH and ACSL4 shRNA (h) Lentiviral Particles: sc-60619-V as alternate gene silencing products.

For independent verification of ACSL4 (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-60619A, sc-60619B and sc-60619C.

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.

RESEARCH USE

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

APPLICATIONS

ACSL4 siRNA (h) is recommended for the inhibition of ACSL4 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

ACSL4 (F-4): sc-365230 is recommended as a control antibody for monitoring of ACSL4 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 ACSL4 gene expression knockdown using RT-PCR Primer: ACSL4 (h)-PR: sc-60619-PR (20 µl, 334 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Cheng, J., et al. 2020. ACSL4 suppresses glioma cells proliferation via activating ferroptosis. Oncol. Rep. 43: 147-158.
2. Kwon, Y.S., et al. 2021. Acyl-CoA synthetase-4 mediates radioresistance of breast cancer cells by regulating FOXM1. Biochem. Pharmacol. 192: 114718.
3. Dai, G., et al. 2022. ACSL4 promotes colorectal cancer and is a potential therapeutic target of emodin. Phytomedicine 102: 154149.
4. Li, Y.J., et al. 2022. Fatty acid oxidation protects cancer cells from apoptosis by increasing mitochondrial membrane lipids. Cell Rep. 39: 110870. Erratum in 2022 Cell Rep. 39: 111044.
5. Mahoney-Sanchez, L., et al. 2022. α synuclein determines ferroptosis sensitivity in dopaminergic neurons via modulation of ether-phospholipid membrane composition. Cell Rep. 40: 111231.
6. Ma, Y., et al. 2024. The diagnostic value of ACSL1, ACSL4, and ACSL5 and the clinical potential of an ACSL inhibitor in non-small-cell lung cancer. Cancers 16: 1170.
7. Kwon, Y.S., et al. 2024. Overcoming radioresistance of breast cancer cells with MAP4K4 inhibitors. Sci. Rep. 14: 7410.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.