SANTA CRUZ BIOTECHNOLOGY, INC.

CLS1 siRNA (r): sc-270218

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Cardiolipin synthetase, CLS1, is a mitochondrial protein that belongs to the CDP-alcohol phosphatidyltransferase class-I family. CLS1 is a multi-pass membrane protein localized to the inner membrane of mitochondria. CLS1 is responsible for the catalyzing the reversible transfer of a phosphatidyl group from one phosphatidyl glycerol molecule to another. This process results in the formation of cardiolipin (CL, or diphosphatidyl glycerol) and glycerol. Diphosphatidyl glycerol is a major component of the mitochondrial membrane and constitutes roughly 20% of total mitochondrial lipids. Having four fatty acid tails rather than the usual two, CL is a double phospholipid that is synthesized in the mitochondrion itself. Defects in the CRLS1 gene are likely to effect metabolism, sustained production of ATP and could contribute to diseases such as Barth syndrome.

REFERENCES

1. Taylor, W.A., et al. 2002. Expression of monolysocardiolipin acyltransferase activity is regulated in concert with the level of cardiolipin and cardiolipin biosynthesis in the mammalian heart. BMC Biochem. 3: 9.
2. Zhong, Q., et al. 2004. Absence of cardiolipin results in temperature sensitivity, respiratory defects, and mitochondrial DNA instability independent of pet56. J. Biol. Chem. 279: 32294-32300.
3. Chen, D., et al. 2006. Identification and functional characterization of hCLS1, a human cardiolipin synthase localized in mitochondria. Biochem. J. 398: 169-176.
4. Houtkooper, R.H., et al. 2006. Identification and characterization of human cardiolipin synthase. FEBS Lett. 580: 3059-3064.
5. Lu, B., et al. 2006. Cloning and characterization of a cDNA encoding human cardiolipin synthase (hCLS1). J. Lipid Res. 47: 1140-1145.
6. Choi, S.Y., et al. 2007. Cardiolipin deficiency releases cytochrome c from the inner mitochondrial membrane and accelerates stimuli-elicited apoptosis. Cell Death Differ. 14: 597-606.
7. Bernal, P., et al. 2007. Compensatory role of the *cis-trans*-isomerase and cardiolipin synthase in the membrane fluidity of *Pseudomonas putida* DOT-T1E. Environ. Microbiol. 9: 1658-1664.
8. de Andrade Rosa, I., et al. 2008. Cardiolipin, a lipid found in mitochondria, hydrogenosomes and bacteria was not detected in *Giardia lamblia*. Exp. Parasitol. 120: 215-220.
9. Schlame, M. 2008. Cardiolipin synthesis for the assembly of bacterial and mitochondrial membranes. J. Lipid Res. 49: 1607-1620.

CHROMOSOMAL LOCATION

Genetic locus: Crls1 (rat) mapping to 3q36.

PROTOCOLS

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

PRODUCT

CLS1 siRNA (r) 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 CLS1 shRNA Plasmid (r): sc-270218-SH and CLS1 shRNA (r) Lentiviral Particles: sc-270218-V as alternate gene silencing products.

For independent verification of CLS1 (r) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-270218A, sc-270218B and sc-270218C.

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

CLS1 siRNA (r) is recommended for the inhibition of CLS1 expression in rat 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 CLS1 gene expression knockdown using RT-PCR Primer: CLS1 (r)-PR: sc-270218-PR (20 µl, 564 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Liu, N.K., et al. 2022. Restoring mitochondrial cardiolipin homeostasis reduces cell death and promotes recovery after spinal cord injury. Cell Death Dis. 13: 1058.

RESEARCH USE

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