SANTA CRUZ BIOTECHNOLOGY, INC.

LARS2 siRNA (h): sc-78462

BACKGROUND

LARS2 (leucyl-tRNA synthetase 2, mitochondrial) is also known as LEURS (leucine-tRNA ligase) and is a 903 amino acid protein. LARS2 is a member of the class-I aminoacyl-tRNA synthetase family and is localized to the mitochondrial matrix. LARS2 catalyzes the aminoacylation of leucine to tRNA(Leu) via a two step reaction during protein synthesis. The two step reaction begins by LARS2 activating leucine with an ATP molecule which yields an adenylate intermediate that then transfers the activated leucine to the 3'-end of the target tRNA. tRNA(Leu) has a variable loop with a specific sequence and orientation which is thought to be important for interaction with LARS2. LARS2 is upregulated in bipolar disorder and schizophrenia and is thought to be overexpressed in an attempt to cause a mutated tRNA(Leu), tRNA(Leu) (UUR), to go through aminoacylation. Diabetes is also thought to be associated with upregulation of LARS2 which may promote intolerance of glucose.

REFERENCES

1. Han, W., et al. 2001. Gene cloning, expression and purification of human mitochondrial tRNA(Leu(UUR)) and its mutant. Sci. China, C, Life Sci. 44: 113-120.
2. Munakata, K., et al. 2005. Mitochondrial DNA 3243A>G mutation and increased expression of LARS2 gene in the brains of patients with bipolar disorder and schizophrenia. Biol. Psychiatry 57: 525-532.
3. 't Hart, L.M., et al. 2005. Evidence that the mitochondrial leucyl tRNA synthetase (LARS2) gene represents a novel type 2 diabetes susceptibility gene. Diabetes 54: 1892-1895.
4. Lue, S.W., et al. 2007. A single residue in leucyl-tRNA synthetase affecting amino acid specificity and tRNA aminoacylation. Biochemistry 46: 4466-4472.
5. Fukunaga, R., et al. 2007. The C-terminal domain of the archaeal leucyl-tRNA synthetase prevents misediting of isoleucyl-tRNA(Ile). Biochemistry 46: 4985-4996.
6. Betha, A.K., et al. 2007. Isolated CP1 domain of *Escherichia coli* leucyl-tRNA synthetase is dependent on flanking hinge motifs for amino acid editing activity. Biochemistry 46: 6258-6267.

CHROMOSOMAL LOCATION

Genetic locus: LARS2 (human) mapping to 3p21.31.

PRODUCT

LARS2 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 LARS2 shRNA Plasmid (h): sc-78462-SH and LARS2 shRNA (h) Lentiviral Particles: sc-78462-V as alternate gene silencing products.

For independent verification of LARS2 (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-78462A, sc-78462B and sc-78462C.

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

LARS2 siRNA (h) is recommended for the inhibition of LARS2 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

LARS2 (G-9): sc-514454 is recommended as a control antibody for monitoring of LARS2 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).

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor LARS2 gene expression knockdown using RT-PCR Primer: LARS2 (h)-PR: sc-78462-PR (20 µl). 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.