SANTA CRUZ BIOTECHNOLOGY, INC.

AARS2 siRNA (h): sc-95483

BACKGROUND

AARS2 (alanyl-tRNA synthetase 2, mitochondrial (putative)), also known as Alanine—tRNA ligase, AARSL or AlaRS, is a 985 amino acid protein belonging to the class-II aminoacyl-tRNA synthetase family. AARS2 contains 22 exons and spans 13.7 kb. Encoded by a gene that maps to human chromosome 6p21.1, AARS2 participates in aminoacyl-tRNA synthetase and ligase activities, as well as ATP, metal ion, and tRNA binding. AARS2 consists of three domains; the N-terminal catalytic domain, the editing domain and the C-terminal C-Ala domain. The editing domain eradicates incorrectly charged amino acids, while the C-Ala domain assists in uniting aminoacylation and editing centers to activate deacylation of misacylated tRNAs. AARS2 assists in the attachment of alanine to tRNA(Ala) when ATP activates alanine to form Ala-AMP, which is transferred to the acceptor end of tRNA(Ala).

REFERENCES

1. Akashi, K., et al. 1998. Potential dual targeting of an *Arabidopsis* archaebacterial-like histidyl-tRNA synthetase to mitochondria and chloroplasts. FEBS Lett. 431: 39-44.
2. Nagase, T., et al. 1999. Prediction of the coding sequences of unidentified human genes. XV. The complete sequences of 100 new cDNA clones from brain which code for large proteins *in vitro*. DNA Res. 6: 337-345.
3. Souciet, G., et al. 1999. Characterization of two bifunctional *Arabdopsis thaliana* genes coding for mitochondrial and cytosolic forms of valyl-tRNA synthetase and threonyl-tRNA synthetase by alternative use of two in-frame AUGs. Eur. J. Biochem. 266: 848-854.
4. Shimada, N., et al. 2001. Dual mode recognition of two isoacceptor tRNAs by mammalian mitochondrial seryl-tRNA synthetase. J. Biol. Chem. 276: 46770-46778.
5. Bonnefond, L., et al. 2005. Toward the full set of human mitochondrial aminoacyl-tRNA synthetases: characterization of AspRS and TyrRS. Biochemistry 44: 4805-4816.
6. Vasta, V., et al. 2009. Next generation sequence analysis for mitochondrial disorders. Genome Med. 1: 100.
7. Latour, P., et al. 2010. A major determinant for binding and aminoacylation of tRNA(Ala) in cytoplasmic Alanyl-tRNA synthetase is mutated in dominant axonal Charcot-Marie-Tooth disease. Am. J. Hum. Genet. 86: 77-82.
8. SWISS-PROT/TrEMBL (Q5JTZ9). World Wide Web URL: http://www.uniprot.org/uniprot/Q5JTZ9

CHROMOSOMAL LOCATION

Genetic locus: AARS2 (human) mapping to 6p21.1.

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.

PRODUCT

AARS2 siRNA (h) is a pool of 2 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 AARS2 shRNA Plasmid (h): sc-95483-SH and AARS2 shRNA (h) Lentiviral Particles: sc-95483-V as alternate gene silencing products.

For independent verification of AARS2 (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-95483A and sc-95483B.

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

AARS2 siRNA (h) is recommended for the inhibition of AARS2 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 AARS2 gene expression knockdown using RT-PCR Primer: AARS2 (h)-PR: sc-95483-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.