SANTA CRUZ BIOTECHNOLOGY, INC.

Mitochondrial CysRs siRNA (h): sc-106227

BACKGROUND

The mitochondrial genome encodes for only 13 proteins, 2 rRNAs and 22 tRNAs. Required for mitochondrial protein synthesis, aminoacyl-tRNA synthetases are transcribed from nuclear DNA and are typically are imported to the mitochondria after translation in the cytosol. Specifically, aminoacyl-tRNA synthetases catalyze the conjugation of an amino acid to its corresponding tRNA. Mitochondrial CysRs (cysteinyl-tRNA synthetase) also known as Cysteine—tRNA ligase, is a 564 amino acid protein that localizes to the mitochondrial matrix. Mitochondrial CysRs utilizes zinc as a cofactor and ATP to conjugate L-cysteine to tRNA(Cys). As a class I aminoacyl-tRNA synthetase, mitochondrial CysRs contains a classical Rossmann fold, a domain through which it binds nucleotides, such as nicotinamide adenine dinucleotide (NAD^+).

REFERENCES

1. Lipman, R.S., et al. 2000. Synthesis of cysteinyl-tRNA(Cys) by a genome that lacks the normal cysteine-tRNA synthetase. Biochemistry 39: 7792-7798.
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3. Jacquin-Becker, C., et al. 2002. Cysteinyl-tRNA formation and prolyl-tRNA synthetase. FEBS Lett. 514: 34-36.
4. Ambrogelly, A., et al. 2004. Cys-tRNACys formation and cysteine biosynthesis in methanogenic archaea: two faces of the same problem? Cell. Mol. Life Sci. 61: 2437-2445.
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. Hauenstein, S.I. and Perona, J.J. 2008. Redundant synthesis of cysteinyl-tRNACys in *Methanosarcina mazei*. J. Biol. Chem. 283: 22007-22017.
7. Zhang, C.M., et al. 2008. Aminoacylation of tRNA with phosphoserine for synthesis of cysteinyl-tRNA(Cys). Nat. Struct. Mol. Biol. 15: 507-514.

CHROMOSOMAL LOCATION

Genetic locus: CARS2 (human) mapping to 13q34.

PRODUCT

Mitochondrial CysRs 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 Mitochondrial CysRs shRNA Plasmid (h): sc-106227-SH and Mitochondrial CysRs shRNA (h) Lentiviral Particles: sc-106227-V as alternate gene silencing products.

For independent verification of Mitochondrial CysRs (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-106227A, sc-106227B and sc-106227C.

RESEARCH USE

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

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

Mitochondrial CysRs siRNA (h) is recommended for the inhibition of Mitochondrial CysRs 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 Mitochondrial CysRs gene expression knockdown using RT-PCR Primer: Mitochondrial CysRs (h)-PR: sc-106227-PR (20 µl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

PROTOCOLS

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