SANTA CRUZ BIOTECHNOLOGY, INC.

Mitochondrial CysRs (P-15): sc-84204

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The Power to Question

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., Sowers, K.R. and Hou, Y.M. 2000. Synthesis of cysteinyl-tRNA (Cys) by a genome that lacks the normal cysteine-tRNA synthetase. Biochemistry 39: 7792-7798.
2. Peeters, N.M., Chapron, A., Giritch, A., Grandjean, O., Lancelin, D., Lhomme, T., Vivrel, A. and Small, I. 2000. Duplication and quadruplication of *Arabidopsis thaliana* cysteinyl- and asparaginyl-tRNA synthetase genes of organellar origin. J. Mol. Evol. 50: 413-423.
3. Jacquin-Becker, C., Ahel, I., Ambrogelly, A., Ruan, B., Söll, D. and Stathopoulos, C. 2002. Cysteinyl-tRNA formation and prolyl-tRNA synthetase. FEBS Lett. 514: 34-36.
4. Ambrogelly, A., Kamtekar, S., Sauerwald, A., Ruan, B., Tumbula-Hansen, D., Kennedy, D., Ahel, I. and Söll, D. 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., Fender, A., Rudinger-Thirion, J., Giegé, R., Florentz, C. and Sissler, M. 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., Liu, C., Slater, S. and Hou, Y.M. 2008. Aminoacylation of tRNA with phosphoserine for synthesis of cysteinyl-tRNA(Cys). Nat. Struct. Mol. Biol. 15: 507-514.
8. Sheppard, K., Yuan, J., Hohn, M.J., Jester, B., Devine, K.M. and Söll, D. 2008. From one amino acid to another: tRNA-dependent amino acid biosynthesis. Nucleic Acids Res. 36: 1813-1825.
9. Online Mendelian Inheritance in Man, OMIM™. 2009. Johns Hopkins University, Baltimore, MD. MIM Number: 612800: World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/

CHROMOSOMAL LOCATION

Genetic locus: CARS2 (human) mapping to 13q34; Cars2 (mouse) mapping to 8 A1.1.

SOURCE

Mitochondrial CysRs (P-15) is an affinity purified rabbit polyclonal antibody raised against a peptide mapping within an internal region of Mitochondrial CysRs of human origin.

PRODUCT

Each vial contains 100 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-84204 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

APPLICATIONS

Mitochondrial CysRs (P-15) is recommended for detection of Mitochondrial CysRs of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Mitochondrial CysRs (P-15) is also recommended for detection of Mitochondrial CysRs in additional species, including equine, canine, bovine, porcine and avian.

Suitable for use as control antibody for Mitochondrial CysRs siRNA (h): sc-106227, Mitochondrial CysRs siRNA (m): sc-149445, Mitochondrial CysRs shRNA Plasmid (h): sc-106227-SH, Mitochondrial CysRs shRNA Plasmid (m): sc-149445-SH, Mitochondrial CysRs shRNA (h) Lentiviral Particles: sc-106227-V and Mitochondrial CysRs shRNA (m) Lentiviral Particles: sc-149445-V.

Molecular Weight of Mitochondrial CysRs: 62 kDa.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-rabbit IgG-HRP: sc-2004 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible goat anti-rabbit IgG-HRP: sc-2030 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunofluorescence: use goat anti-rabbit IgG-FITC: sc-2012 (dilution range: 1:100-1:400) or goat anti-rabbit IgG-TR: sc-2780 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

RESEARCH USE

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

PROTOCOLS

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