SANTA CRUZ BIOTECHNOLOGY, INC.

TyrRS siRNA (h): sc-37671

BACKGROUND

Tryptophanyl-tRNA synthetases are essential enzymes that catalyze the aminoacylation of tRNA(Trp) with tryptophan, an essential function of the cell's protein synthesis machinery. Two forms of tryptophanyl-tRNA synthetase exist; a cytoplasmic form, named TrpRS (also known as YARS), and a mitochondrial form (mt-TyrRS), named YARS2. In normal cells, human TrpRS exists as a full length form and as a truncated form designated mini TrpRS, which is produced by alternative splicing. Expression of mini TrpRS is highly stimulated in human cells by the addition of IFN-γ. Although both human full length TrpRS and mini TrpRS are enzymatically active in aminoacylation, they differ in angiostatic activity. The tyrosyl-tRNA synthetase (TyrRS), a protein related to TrpRS, exists as a homodimeric enzyme that catalyzes the aminoacylation of tRNA(Tyr) by L-tyrosine.

REFERENCES

1. Wakasugi, K., et al. 2002. A human aminoacyl-tRNA synthetase as a regulator of angiogenesis. Proc. Natl. Acad. Sci. USA 99: 173-177.
2. Online Mendelian Inheritance in Man, OMIM™. 2002. Johns Hopkins University, Baltimore, MD. MIM Number: 191050. World Wide Web URL: http://www.ncbi.nlm.nih.gov/omim/
3. Jia, J., et al. 2003. Expression, purification, and characterization of human tyrosyl-tRNA synthetase. Protein Expr. Purif. 27: 104-108.
4. Yang, X.L., et al. 2004. Relationship of two human tRNA synthetases used in cell signaling. Trends Biochem. Sci. 29: 250-256.
5. Kise, Y., et al. 2004. A short peptide insertion crucial for angiostatic activity of human tryptophanyl-tRNA synthetase. Nat. Struct. Mol. Biol. 11: 149-156.
6. Bonnefond, L., et al. 2005. Human mitochondrial TyrRS disobeys the tyrosine identity rules. RNA 11: 558-562.
7. Bonnefond, L., et al. 2005. Toward the full set of human mitochondrial aminoacyl-tRNA synthetases: characterization of AspRS and TyrRS. Biochemistry 44: 4805-4816.
8. LocusLink Report (LocusID: 8565). http://www.ncbi.nlm.nih.gov/LocusLink/

CHROMOSOMAL LOCATION

Genetic locus: YARS (human) mapping to 1p35.1.

PRODUCT

TyrRS 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 TyrRS shRNA Plasmid (h): sc-37671-SH and TyrRS shRNA (h) Lentiviral Particles: sc-37671-V as alternate gene silencing products.

For independent verification of TyrRS (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-37671A, sc-37671B and sc-37671C.

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

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

TyrRS (H-11): sc-166741 is recommended as a control antibody for monitoring of TyrRS 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 TyrRS gene expression knockdown using RT-PCR Primer: TyrRS (h)-PR: sc-37671-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.