SANTA CRUZ BIOTECHNOLOGY, INC.

TPH siRNA (h): sc-41526

BACKGROUND

Phenylalanine hydroxylase (PAH), tyrosine hydroxylase (TH) and tryptophan hydroxylase (TPH) comprise a small family of monooxygenases that use tetrahydropterine as a cofactor during the catabolism of aromatic L-amino acids. PAH, TH and TPH all contain catalytic domains with an amino-terminal regulatory domain and a short carboxy-terminal tetramerization domain. Each of these enzymes also contains a single ferrous iron atom, which is bound to two histidines and a glutamate and is likely to be involved in the formation of the hydroxylating intermediate. TPH is the first and rate-limiting step in the biosynthesis of serotonin in the central nervous system and melatonin in the pineal gland. Alteration of TPH function may be a key factor in the pathology of several neuropsychiatric disorders associated with serotonin, including depression, aggression, alcoholism and schizophrenia. For instance, L-DOPA, which is used as a common therapy for Parkinson's disease (PD) patients, inhibits TPH function, which subsequently, is thought to contribute to the onset of depression in PD patients.

REFERENCES

1. Abbar, M., et al. 1996. Epidemiologic and molecular genetic of suicidal behavior. Encephale 22: 19-24.
2. Mockus, S.M. and Vrana, K.E. 1998. Advances in the molecular characterization of tryptophan hydroxylase. J. Mol. Neurosci. 10: 163-179.
3. Fitzpatrick, P.F. 1999. Tetrahydropterin-dependent amino acid hydroxylases. Annu. Rev. Biochem. 68: 355-381.
4. Kuhn, D.M. 1999. Tryptophan hydroxylase regulation. Drug-induced modifications that alter serotonin neuronal function. Adv. Exp. Med. Biol. 467: 19-27.
5. Kowlessur, D. and Kaufman, S. 1999. Cloning and expression of recombinant human pineal tryptophan hydroxylase in *Escherichia coli:* purification and characterization of the cloned enzyme. Biochim. Biophys. Acta 1434: 317-330.
6. Nagatsu, T. and Ichinose, H. 1999. Regulation of pteridine-requiring enzymes by the cofactor tetrahydrobiopterin. Mol. Neurobiol. 19: 79-96.
7. Veenstra-VanderWeele, J., et al. 2000. Pharmacogenetics and the serotonin system: initial studies and future directions. Eur. J. Pharmacol. 410: 165-181.

CHROMOSOMAL LOCATION

Genetic Locus: TPH1 (human) mapping to 11p15.1.

PRODUCT

TPH 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 TPH shRNA Plasmid (h): sc-41526-SH and TPH shRNA (h) Lentiviral Particles: sc-41526-V as alternate gene silencing products.

For independent verification of TPH (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-41526A, sc-41526B and sc-41526C.

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

TPH siRNA (h) is recommended for the inhibition of TPH 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 TPH gene expression knockdown using RT-PCR Primer: TPH (h)-PR: sc-41526-PR (20 µl, 524 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Shinka, T., et al. 2011. Serotonin synthesis and metabolism-related molecules in a human prostate cancer cell line. Oncol. Lett. 2: 211-215.
2. Cheng, H.H., et al. 2012. Control of cyclooxygenase-2 expression and tumorigenesis by endogenous 5-methoxytryptophan. Proc. Natl. Acad. Sci. USA 109: 13231-13236.
3. Cheng, H.H., et al. 2014. Quiescent and proliferative fibroblasts exhibit differential p300 HAT activation through control of 5-methoxytryptophan production. PLoS ONE 9: e88507.

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.