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SANTA CRUZ BIOTECHNOLOGY, INC.

CTH siRNA (m): sc-142618

BACKGROUND

CTH (cystathionine γ-lyase), also known as CSE or γ-cystathionase, is a member of the transsulfuration enzyme family and participates in the transsulfuration pathway. CTH is a cytoplasmic enzyme produced in the cytosol and is responsible for catalyzing the pyridoxal phosphate-dependent β-disulfide elimination reaction resulting in ammonium, pyruvate and thiocysteine. The thiocysteine that is produced may then react with other thiols (or cysteine) and form hydrogen sulfide (H_2S). Thus, CTH is the major H_2S-producing enzyme in kidney, liver, vascular smooth muscle cells and enterocytes. The endogenous production of H_2S plays a significant role in the regulation of cellular functions, including cell growth, hyperpolarization of cell membranes, modulation of neuronal excitability and relaxation of smooth muscle cells. Mutations in the gene encoding CTH can result in the autosomal recessive disease cystathioninuria; a disorder characterized by the unusual accumulation of plasma cystathionine causing increased urinary excretion.

REFERENCES

1. Lu, Y., et al. 1992. Cloning and nucleotide sequence of human liver cDNA encoding for cystathionine γ-lyase. Biochem. Biophys. Res. Commun. 189: 749-758.
2. Yang, G., et al. 2004. Cystathionine γ-lyase overexpression inhibits cell proliferation via a H_2S-dependent modulation of ERK1/2 phosphorylation and $p21^{Cip/WAK-1}$. J. Biol. Chem. 279: 49199-49205.

CHROMOSOMAL LOCATION

Genetic locus: Cth (mouse) mapping to 3 H4.

PRODUCT

CTH siRNA (m) 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 CTH shRNA Plasmid (m): sc-142618-SH and CTH shRNA (m) Lentiviral Particles: sc-142618-V as alternate gene silencing products.

For independent verification of CTH (m) gene silencing results, we also provide the individual siRNA duplex components. Each is available as 3.3 nmol of lyophilized siRNA. These include: sc-142618A and sc-142618B.

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

CTH siRNA (m) is recommended for the inhibition of CTH expression in mouse 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

CTH (F-1): sc-374249 is recommended as a control antibody for monitoring of CTH 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).

RT-PCR REAGENTS

Semi-quantitative RT-PCR may be performed to monitor CTH gene expression knockdown using RT-PCR Primer: CTH (m)-PR: sc-142618-PR (20 µl, 445 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Liu, F., et al. 2014. Hydrogen sulfide improves wound healing via restoration of endothelial progenitor cell functions and activation of angiopoietin-1 in type 2 diabetes. Diabetes 63: 1763-1778.
2. Velmurugan, G.V., et al. 2015. Depletion of H_2S during obesity enhances store-operated Ca^{2+} entry in adipose tissue macrophages to increase cytokine production. Sci. Signal. 8: ra128.
3. Miao, L., et al. 2016. Hydrogen sulfide recruits macrophage migration by Integrin β1-Src-FAK/Pyk2-Rac pathway in myocardial infarction. Sci. Rep. 6: 22363.
4. Wang, X.L., et al. 2018. Endogenous hydrogen sulfide ameliorates NOX4 induced oxidative stress in LPS-stimulated macrophages and mice. Cell. Physiol. Biochem. 47: 458-474.
5. Parsanathan, R. and Jain, S.K. 2018. Hydrogen sulfide increases glutathione biosynthesis, and glucose uptake and utilisation in C2C12 mouse myotubes. Free Radic. Res. 52: 288-303.
6. Parsanathan, R. and Jain, S.K. 2019. Hydrogen sulfide regulates circadian-clock genes in C2C12 myotubes and the muscle of high-fat-diet-fed mice. Arch. Biochem. Biophys. 672: 108054.
7. Nlandu-Khodo, S., et al. 2020. Tubular β-catenin and FoxO3 interactions protect in chronic kidney disease. JCI Insight 5: 135454.

RESEARCH USE

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