SANTA CRUZ BIOTECHNOLOGY, INC.

ALDH1L2 siRNA (h): sc-96049

BACKGROUND

Aldehyde dehydrogenases (ALDHs) mediate $NADP^+$-dependent oxidation of aldehydes into acids during detoxification of alcohol-derived acetaldehyde, lipid peroxidation and metabolism of corticosteroids, biogenic amines and neurotransmitters. ALDH1L2 (aldehyde dehydrogenase 1 family, member L2), also known as probable 10-formyltetrahydrofolate dehydrogenase ALDH1L2 or mtFDH (mitochondrial 10-formyltetrahydrofolate dehydrogenase), is a 923 amino acid protein belonging to the aldehyde dehydrogenase family and the ALDH1L subfamily. Encoded by a gene that maps to human chromosome 12q23.3, ALDH1L2 is composed of 23 exons, contains one acyl carrier domain and exists as 3 alternatively spliced isoforms. ALDH1L2 participates in acyl carrier activity, cofactor binding, formyltetrahydrofolate dehydrogenase functions, transferase activities and phosphopantetheine binding.

REFERENCES

1. Vasiliou, V., et al. 2005. Analysis and update of the human aldehyde dehydrogenase (ALDH) gene family. Hum. Genomics 2: 138-143.
2. Sherva, R., et al. 2009. Associations and interactions between SNPs in the alcohol metabolizing genes and alcoholism phenotypes in European Americans. Alcohol. Clin. Exp. Res. 33: 848-857.
3. Black, W.J., et al. 2009. Human aldehyde dehydrogenase genes: alternatively spliced transcriptional variants and their suggested nomenclature. Pharmacogenet. Genomics 19: 893-902.
4. Wang, L.L., et al. 2010. Phenotype prediction of deleterious nonsynonymous single nucleotide polymorphisms in human alcohol metabolism-related genes: a bioinformatics study. Alcohol 44: 425-438.
5. Dombroski, B.A., et al. 2010. Gene expression and genetic variation in response to endoplasmic reticulum stress in human cells. Am. J. Hum. Genet. 86: 719-729.
6. Hart, S.N., et al. 2010. A comparison of whole genome gene expression profiles of HepaRG cells and Hep G2 cells to primary human hepatocytes and human liver tissues. Drug Metab. Dispos. 38: 988-994.
7. Strickland, K.C., et al. 2010. Acyl carrier protein-specific 4'-phosphopantetheinyl transferase activates 10-formyltetrahydrofolate dehydrogenase. J. Biol. Chem. 285: 1627-1633.

CHROMOSOMAL LOCATION

Genetic locus: ALDH1L2 (human) mapping to 12q23.3.

PRODUCT

ALDH1L2 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 ALDH1L2 shRNA Plasmid (h): sc-96049-SH and ALDH1L2 shRNA (h) Lentiviral Particles: sc-96049-V as alternate gene silencing products.

For independent verification of ALDH1L2 (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-96049A, sc-96049B and sc-96049C.

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

ALDH1L2 siRNA (h) is recommended for the inhibition of ALDH1L2 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 ALDH1L2 gene expression knockdown using RT-PCR Primer: ALDH1L2 (h)-PR: sc-96049-PR (20 µl, 505 bp). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

SELECT PRODUCT CITATIONS

1. Fan, J., et al. 2014. Quantitative flux analysis reveals folate-dependent NADPH production. Nature 510: 298-302.
2. Zhang, Y., et al. 2022. G6PD-mediated increase in de novo $NADP^+$ biosynthesis promotes antioxidant defense and tumor metastasis. Sci. Adv. 8: eabo0404.

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.