

ESD siRNA (h): sc-105338

BACKGROUND

ESD (esterase D) is also known as S-formylglutathione hydrolase and is a 282 amino acid protein that is a member of the esterase D family. ESD is highly expressed in placenta, kidney, liver and erythrocytes, and is localized to the cytoplasm, as well as to cytoplasmic vesicles. The main function of ESD is to detoxify formaldehyde while providing energy. Formaldehyde is oxidized by ADH5 which yields S-formylglutathione. ESD then catalyzes the hydrolysis of S-formylglutathione to the reduced forms of formic acid and glutathione. In addition, ESD hydrolyzes a variety of different neutral ester substrates and can act as a carboxylesterase. ESD may also act as a cysteine hydrolase which is inactivated by thiol alkylating agents. ESD gene polymorphism can lead to reduced enzymatic activity which may cause susceptibility to many conditions, including toxic liver cirrhosis, retinoblastoma, obesity and autism.

REFERENCES

- Harms, N., et al. 1996. S-formylglutathione hydrolase of *Paracoccus denitrificans* is homologous to human esterase D: a universal pathway for formaldehyde detoxification? *J. Bacteriol.* 178: 6296-6299.
- McAuley, K.E., et al. 2003. Purification, crystallization and preliminary X-ray diffraction analysis of S-formylglutathione hydrolase from *Arabidopsis thaliana*: effects of pressure and selenomethionine substitution on space-group changes. *Acta Crystallogr. D Biol. Crystallogr.* 59: 2272-2274.
- Yurimoto, H., et al. 2003. Physiological role of S-formylglutathione hydrolase in C₁ metabolism of the methylotrophic yeast *Candida boidinii*. *Microbiology* 149: 1971-1979.
- Yuasa, I., et al. 2004. Molecular basis of ESD*5 and ESD*7 and haplotype analysis with new polymorphisms in introns. *Hum. Biol.* 76: 479-488.
- Online Mendelian Inheritance in Man, OMIM™. 2004. Johns Hopkins University, Baltimore, MD. MIM Number: 133280. World Wide Web URL: <http://www.ncbi.nlm.nih.gov/omim/>
- Cummins, I., et al. 2006. Unique regulation of the active site of the serine esterase S-formylglutathione hydrolase. *J. Mol. Biol.* 359: 422-432.

CHROMOSOMAL LOCATION

Genetic locus: ESD (human) mapping to 13q14.2.

PRODUCT

ESD siRNA (h) 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 ESD shRNA Plasmid (h): sc-105338-SH and ESD shRNA (h) Lentiviral Particles: sc-105338-V as alternate gene silencing products.

For independent verification of ESD (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-105338A and sc-105338B.

RESEARCH USE

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

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

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

ESD (A-5): sc-514892 is recommended as a control antibody for monitoring of ESD 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 ESD gene expression knockdown using RT-PCR Primer: ESD (h)-PR: sc-105338-PR (20 μl). Annealing temperature for the primers should be 55-60° C and the extension temperature should be 68-72° C.

PROTOCOLS

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