SANTA CRUZ BIOTECHNOLOGY, INC.

ESD (D-4): sc-514633

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

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

1. 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.
2. 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.
3. Yurimoto, H., et al. 2003. Physiological role of S-formylglutathione hydrolase in C_1 metabolism of the methylotrophic yeast *Candida boidinii*. Microbiology 149: 1971-1979.
4. 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.
5. 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/
6. Gonzalez, C.F., et al. 2006. Molecular basis of formaldehyde detoxification. Characterization of two S-formylglutathione hydrolases from *Escherichia coli*, FrmB and YeiG. J. Biol. Chem. 281: 14514-14522.
7. 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.

SOURCE

ESD (D-4) is a mouse monoclonal antibody raised against amino acids 1-282 representing full length ESD of human origin.

PRODUCT

Each vial contains 200 µg IgG_1 in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

RESEARCH USE

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

APPLICATIONS

ESD (D-4) is recommended for detection of ESD of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for ESD siRNA (h): sc-105338, ESD shRNA Plasmid (h): sc-105338-SH and ESD shRNA (h) Lentiviral Particles: sc-105338-V.

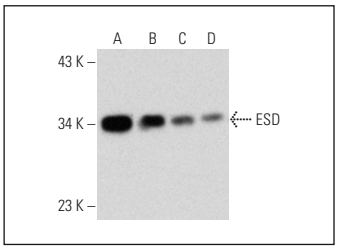
Molecular Weight of ESD: 31 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204, K-562 whole cell lysate: sc-2203 or Caco-2 cell lysate: sc-2262.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-mouse IgG-HRP: sc-2005 (dilution range: 1:2000-1:32,000) or Cruz Marker™ compatible goat anti-mouse IgG-HRP: sc-2031 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use goat anti-mouse IgG-FITC: sc-2010 (dilution range: 1:100-1:400) or goat anti-mouse IgG-TR: sc-2781 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

DATA



ESD (D-4): sc-514633. Western blot analysis of ESD expression in Jurkat (**A**), K-562 (**B**), Caco-2 (**C**) and HeLa (**D**) whole cell lysates.

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

PROTOCOLS

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