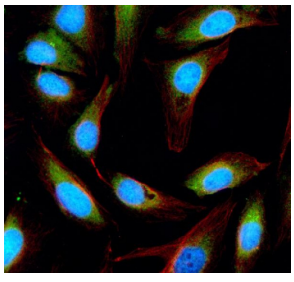
ESD Antibody / Esterase D (FY12168)

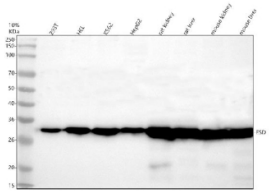
Catalog No.	Formulation	Size
FY12168	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

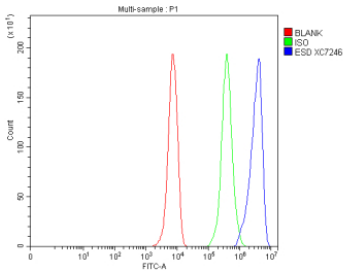
Availability	1-2 days
Species Reactivity	Human, Mouse, Rat
Format	Lyophilized
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	P10768
Localization	Cytoplasm
Applications	Western Blot: 0.25-0.5ug/ml Immunocytochemistry/Immunofluorescence: 5ug/ml Flow cytometry: 1-3ug/million cells ELISA: 0.1-0.5ug/ml
Limitations	This ESD antibody is available for research use only.



Immunofluorescent staining of ESD using anti-ESD antibody (green) and anti-Beta Tubulin antibody (red). ESD was detected in an immunocytochemical section of U2OS cells. Enzyme antigen retrieval was performed using IHC enzyme antigen retrieval reagent for 15 mins. The cells were blocked with 10% goat serum. And then incubated with 5 ug/ml rabbit anti-ESD antibody and mouse anti-Beta Tubulin antibody overnight at 4oC. DyLight 488 Conjugated Goat Anti-Rabbit IgG and Cy3 Conjugated Goat Anti-Mouse IgG were used as secondary antibody at 1:500 dilution and incubated for 30 minutes at 37oC. The section was counterstained with DAPI nuclear stain (blue). Visualize using a fluorescence microscope and filter sets appropriate for the label used.



Western blot analysis of ESD using anti-ESD antibody. Electrophoresis was performed on a 10% SDS-PAGE gel at 80V (Stacking gel) / 120V (Resolving gel) for 2 hours. Lane 1: human 293T whole cell lysates, Lane 2: human HEL whole cell lysates, Lane 3: human K562 whole cell lysates, Lane 4: human HepG2 whole cell lysates, Lane 5: rat kidney tissue lysates, Lane 6: rat liver tissue lysates, Lane 7: mouse kidney tissue lysates, Lane 8: mouse liver tissue lysates. After electrophoresis, proteins were transferred to a nitrocellulose membrane at 150 mA for 50-90 minutes. Blocked the membrane with 5% non-fat milk/TBS for 1.5 hour at RT. The membrane was incubated with rabbit anti-ESD antibody at 0.5 ug/ml overnight at 4oC, then washed with TBS-0.1%Tween 3 times with 5 minutes each and probed with a goat anti-rabbit IgG-HRP secondary antibody at a dilution of 1:5000 for 1.5 hour at RT. The signal was developed using an ECL Plus Western Blotting Substrate. A specific band was detected for ESD at approximately 31 kDa. The expected band size for ESD is at 31 kDa.



Flow Cytometry analysis of HepG2 cells using anti-ESD antibody. Overlay histogram showing HepG2 cells stained with (Blue line). To facilitate intracellular staining, cells were fixed with 4% paraformaldehyde and permeabilized with permeabilization buffer. The cells were blocked with 10% normal goat serum. And then incubated with rabbit anti-ESD antibody (1 ug/million cells) for 30 min at 20oC. DyLight 488 conjugated goat anti-rabbit IgG (5-10 ug/million cells) was used as secondary antibody for 30 minutes at 20oC. Isotype control antibody (Green line) was rabbit IgG (1 ug/million cells) used under the same conditions. Unlabelled sample without incubation with primary antibody and secondary antibody (Red line) was used as a blank control.

Description

ESD antibody detects Esterase D, encoded by the ESD gene on chromosome 13q14.11. ESD antibody is used to study this cytosolic serine hydrolase involved in detoxification and xenobiotic metabolism. ESD was originally characterized as a polymorphic enzyme used in forensic medicine for paternity testing and blood typing. Beyond this historical role, Esterase D has biological functions in processing of ester-containing molecules, detoxification of aldehydes, and metabolism of drugs and environmental chemicals. It is expressed in liver, kidney, lung, and erythrocytes, reflecting its general detoxification role.

Structurally, Esterase D is a 282 amino acid protein with an alpha/beta hydrolase fold. It contains the conserved catalytic triad of serine, histidine, and aspartate typical of serine esterases. Its active site is adapted for hydrolyzing a wide range of small esters. Genetic polymorphisms in ESD lead to enzyme variants with distinct electrophoretic mobility, which historically formed the basis of forensic applications. The conserved structure supports its role as a versatile detoxifying enzyme.

Functionally, ESD hydrolyzes ester bonds in endogenous and exogenous compounds, contributing to clearance of aldehydes and drugs. It also participates in formaldehyde detoxification by metabolizing S-formylglutathione. Knockout or deficiency studies suggest that loss of Esterase D activity impairs detoxification pathways and increases susceptibility to oxidative stress. Researchers employ ESD antibody to study its enzymatic activity, tissue distribution, and regulation under toxicant exposure.

Clinically, ESD deficiency has been associated with retinoblastoma and other developmental disorders due to its chromosomal location near the RB1 tumor suppressor gene. Altered ESD activity is also reported in liver disease, hemolytic anemia, and metabolic disorders. As a polymorphic enzyme, Esterase D has served as a genetic marker in population genetics and forensic investigations. Its ability to detoxify aldehydes and esters makes it relevant to environmental health and pharmacology. NSJ Bioreagents supplies ESD antibody for research into metabolism, toxicology, and disease associations.

Experimentally, ESD antibody is used in western blotting to detect the ~33 kDa protein, in enzymatic assays to measure

esterase activity, and in immunohistochemistry to study tissue expression. Immunoprecipitation with ESD antibody allows analysis of its enzyme complexes and potential regulatory partners. These applications provide tools for dissecting detoxification pathways and oxidative stress regulation.

Application Notes

Optimal dilution of the ESD antibody should be determined by the researcher.

Immunogen

E.coli-derived human ESD recombinant protein (Position: M1-A282) was used as the immunogen for the ESD antibody.

Storage

After reconstitution, the ESD antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.

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