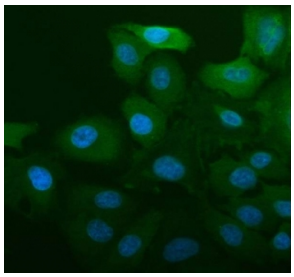
RALDH1 Antibody / Retinaldehyde Dehydrogenase 1 Antibody (R30756)

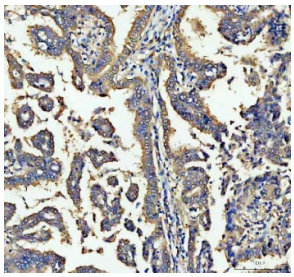
Catalog No.	Formulation	Size
R30756	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

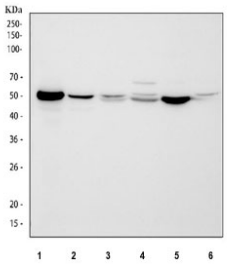
Species Reactivity	Human, Mouse, Rat
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Antigen affinity
Buffer	Lyophilized from 1X PBS with 2% Trehalose
UniProt	P00352
Localization	Cytoplasm
Applications	Western blot: 0.5-1ug/ml Immunohistochemistry (FFPE): 2-5ug/ml Immunofluorescence: 5ug/ml Flow cytometry: 1-3ug/million cells
Limitations	This RALDH1 Antibody / Retinaldehyde Dehydrogenase 1 Antibody is available for research use only.



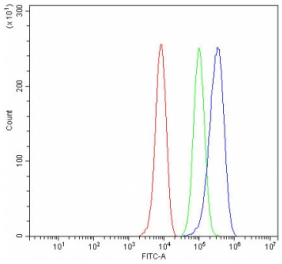
RALDH1 Antibody IF Analysis of Human A549 Cells. Immunofluorescence analysis of formalin-fixed, paraffin-embedded human A549 cells using Retinaldehyde Dehydrogenase 1 Antibody. Green fluorescence is observed predominantly in the cytoplasm, consistent with the established cytosolic localization of ALDH1A1. Cell nuclei are counterstained with DAPI (blue). Heat-induced epitope retrieval was performed using citrate buffer (pH 6.0) for 20 minutes.



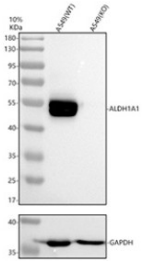
RALDH1 Antibody IHC Analysis of Human Lung Cancer Tissue. Immunohistochemical analysis of formalin-fixed, paraffin-embedded human lung cancer tissue using Retinaldehyde Dehydrogenase 1 Antibody. Brown DAB staining is observed in the cytoplasm of tumor cells, demonstrating ALDH1A1-associated immunoreactivity within the tissue. Heat-induced epitope retrieval was performed using EDTA buffer (pH 8.0) for 20 minutes.



RALDH1 Antibody WB Analysis of Human A549, HepG2, Mouse Liver, Mouse Kidney, Rat Liver and Rat Kidney Samples. Western blot analysis of human A549 (lane 1) and HepG2 (lane 2) cell lysates, rat liver (lane 3), rat kidney (lane 4), mouse liver (lane 5), and mouse kidney (lane 6) tissue lysates using Retinaldehyde Dehydrogenase 1 Antibody. Immunoreactive bands are detected at approximately 55 kDa, consistent with the predicted molecular weight of ALDH1A1.



RALDH1 Antibody FACS Staining of Human HepG2 Cells. Flow cytometry analysis of fixed and permeabilized human HepG2 cells using Retinaldehyde Dehydrogenase 1 Antibody at 1 ug per million cells following blocking with goat serum. The histogram compares cells alone (red), isotype control (green), and antibody-stained cells (blue). The antibody-stained population exhibits a clear rightward fluorescence shift relative to the isotype control.



RALDH1 Antibody WB Analysis of Human A549 WT and ALDH1A1 KO Cells. Western blot analysis of wild-type (WT) A549 cell lysate (lane 1) and ALDH1A1 knockout (KO) A549 cell lysate (lane 2) using Retinaldehyde Dehydrogenase 1 Antibody. A prominent immunoreactive band is detected at approximately 55 kDa in WT cells and is markedly reduced in ALDH1A1 KO cells, supporting antibody specificity. Samples containing 30 ug of protein per lane were separated by 10% SDS-PAGE, and the primary antibody was used at 0.5 ug/ml. GAPDH served as the loading control.

Description

RALDH1 Antibody / Retinaldehyde Dehydrogenase 1 Antibody targets ALDH1A1, a cytosolic enzyme belonging to the aldehyde dehydrogenase superfamily. Also known as retinaldehyde dehydrogenase 1 or ALDH1, this NAD-dependent enzyme catalyzes the oxidation of aldehydes to their corresponding carboxylic acids. ALDH1A1 participates in aldehyde detoxification, retinoid metabolism, and the regulation of cellular responses to oxidative and metabolic stress.

One of the enzyme's important biological functions is the conversion of retinaldehyde into retinoic acid. Retinaldehyde is generated through the oxidation of retinol, while its subsequent conversion to retinoic acid represents a key step in retinoid metabolism. Retinoic acid acts as a signaling molecule that regulates gene expression through nuclear retinoic acid receptors. These signaling pathways influence cellular differentiation, proliferation, tissue development, and the maintenance of specialized cellular functions.

ALDH1A1 also metabolizes a variety of endogenous and exogenous aldehydes. Reactive aldehydes can arise during lipid peroxidation, alcohol metabolism, and other biochemical processes. Their accumulation may damage proteins, nucleic acids, and cellular membranes. By converting susceptible aldehyde substrates into less reactive products, ALDH1A1 contributes to cellular protection against aldehyde-associated toxicity. Its enzymatic activity is therefore connected to metabolic homeostasis and cellular defense mechanisms.

In addition to its metabolic functions, ALDH1A1 has attracted considerable attention in cancer biology. Elevated aldehyde dehydrogenase activity is frequently associated with populations of tumor cells exhibiting stem cell-like characteristics, although this activity may involve multiple ALDH family members. ALDH1A1 expression has been investigated in relation to tumor differentiation, therapeutic resistance, and cellular adaptation to oxidative stress. Its biological significance varies with tissue type, tumor context, and the expression of other aldehyde-metabolizing enzymes.

ALDH1A1 also contributes to corneal physiology, where it can function as a crystallin associated with the maintenance of optical transparency. These diverse activities illustrate the enzyme's importance beyond conventional aldehyde detoxification. RALDH1 Antibody supports research into retinaldehyde metabolism, retinoic acid biosynthesis, cellular detoxification, cancer-associated metabolic changes, and the molecular mechanisms connecting aldehyde metabolism with cellular differentiation.

For broader multi-application ALDH1A1 detection including IF and flow cytometry workflows, see our ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker page.

Application Notes

The stated application concentrations are suggested starting amounts. Titration of the RALDH1 Antibody / Retinaldehyde Dehydrogenase 1 Antibody may be required due to differences in protocols and secondary/substrate sensitivity.

Immunogen

Amino acids 283-303 (DLDNAVEFAHHGVFYHQGQCC-human) were used as the immunogen for this ALDH1A1 / RALDH1 antibody.

Storage

After reconstitution, the ALDH1A1 / RALDH1 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.

Alternate Names

ALDH1A1 antibody, Retinaldehyde dehydrogenase 1 antibody, Aldehyde dehydrogenase 1A1 antibody, Aldehyde dehydrogenase 1 antibody, Acetaldehyde dehydrogenase 1 antibody, RALDH1 polyclonal antibody

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