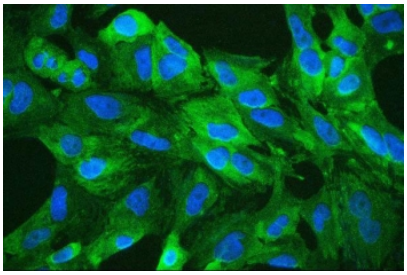
ALDH1A1 Polyclonal Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker (RQ5510)

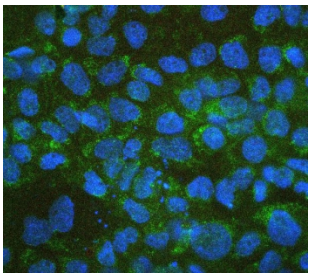
Catalog No.	Formulation	Size
RQ5510	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

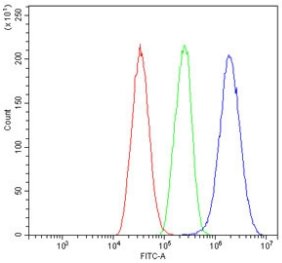
Species Reactivity	Human, Mouse, Rat
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Affinity purified
Buffer	Lyophilized from 1X PBS with 2% Trehalose and 0.025% sodium azide
UniProt	P00352
Applications	Western blot: 0.25-0.5ug/ml Immunohistochemistry (FFPE): 1-2ug/ml Immunofluorescence: 2-4ug/ml Flow cytometry: 1-3ug/million cells Direct ELISA: 0.1-0.5ug/ml
Limitations	This ALDH1A1 Polyclonal Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker is available for research use only.



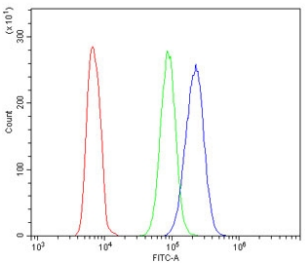
ALDH1A1 Polyclonal Antibody A549 Cell IF. Immunofluorescence analysis of FFPE human A549 cells stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker (green). Aldehyde dehydrogenase 1 family member A1 / ALDH1A1 shows predominantly cytoplasmic fluorescence within tumor epithelial cells, consistent with the known localization of this aldehyde detoxification and retinoic acid biosynthesis enzyme. Nuclei are counterstained with DAPI (blue). HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



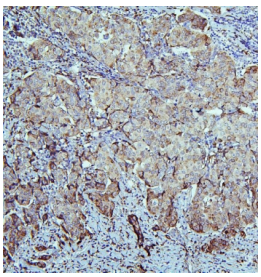
ALDH1A1 Polyclonal Antibody IF. Immunofluorescence analysis of FFPE human A431 cells stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker (green). Cytoplasmic ALDH1A1 fluorescence is detected throughout the epithelial tumor cell population, consistent with the established localization of Aldehyde dehydrogenase 1 family member A1 / ALDH1A1 in metabolically active carcinoma cells. Nuclear counterstaining was performed with DAPI (blue). HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



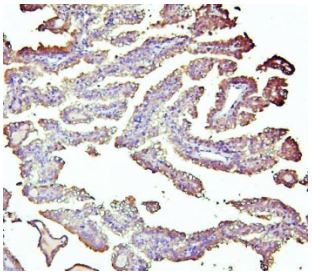
ALDH1A1 Polyclonal Antibody HepG2 Cell FACS. Flow cytometry analysis of human HepG2 cells using ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker. The ALDH1A1-stained population (blue) demonstrates a clear rightward fluorescence shift relative to the isotype control (green) and unstained cells (red), consistent with expression of Aldehyde dehydrogenase 1 family member A1 / ALDH1A1 in hepatocellular carcinoma-derived cells. Cells were blocked with goat sera prior to staining and tested at 1 ug antibody per million cells.



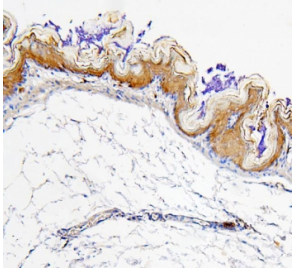
ALDH1A1 Polyclonal Antibody FACS. Flow cytometry analysis of human HL60 cells stained with ALDH1A1 antibody. The ALDH1A1-positive population (blue) shows a distinct fluorescence shift compared to the isotype control (green) and unstained cells (red), supporting expression of Aldehyde dehydrogenase 1 family member A1 / ALDH1A1 in this promyelocytic leukemia cell line. Cells were blocked with goat sera prior to staining and tested at 1 ug antibody per million cells.



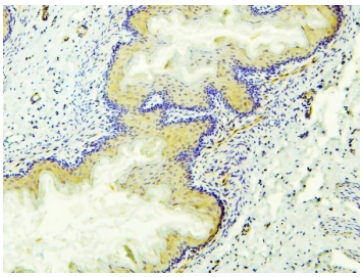
ALDH1A1 Polyclonal Antibody Breast Cancer IHC. Immunohistochemistry analysis of FFPE human breast carcinoma stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker. Tumor epithelial cells demonstrate moderate to strong cytoplasmic HRP-DAB brown staining for Aldehyde dehydrogenase 1 family member A1 / ALDH1A1, with heterogeneous expression across malignant cell clusters consistent with the known association of ALDH1A1 with stem-like tumor cell populations and metabolic adaptation in breast cancer. Hematoxylin counterstain highlights nuclei in blue. HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



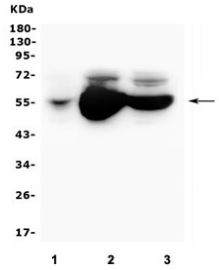
ALDH1A1 Polyclonal Antibody Renal Cancer IHC. Immunohistochemistry analysis of FFPE human renal carcinoma stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker. Tumor epithelial cells display cytoplasmic and partial membranous HRP-DAB brown staining for Aldehyde dehydrogenase 1 family member A1 / ALDH1A1, consistent with expression of this aldehyde detoxification and retinoic acid metabolism enzyme in renal tumor tissue. Hematoxylin counterstain highlights nuclei in blue. HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



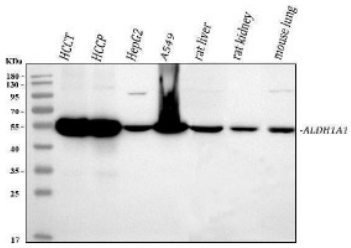
ALDH1A1 Polyclonal Antibody Mouse Stomach IHC. Immunohistochemistry analysis of FFPE mouse stomach tissue stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker. Strong cytoplasmic HRP-DAB brown staining is observed within the gastric epithelial lining, consistent with expression of Aldehyde dehydrogenase 1 family member A1 / ALDH1A1 in metabolically active epithelial cells involved in aldehyde detoxification and retinoic acid metabolism. Hematoxylin counterstain highlights nuclei in blue. HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



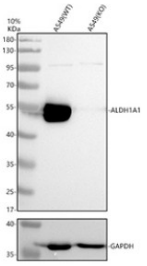
ALDH1A1 Polyclonal Antibody Rat Stomach IHC. Immunohistochemistry analysis of FFPE rat stomach tissue stained with ALDH1A1 Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker. Gastric epithelial cells exhibit cytoplasmic HRP-DAB brown staining for Aldehyde dehydrogenase 1 family member A1 / ALDH1A1, consistent with the known role of this aldehyde-metabolizing enzyme in gastrointestinal epithelial metabolism and cellular detoxification pathways. Hematoxylin counterstain highlights nuclei in blue. HIER: boil tissue sections in 10 mM citrate buffer, pH6, for 20 min followed by cooling before testing.



Western blot testing of human 1) placenta, 2) A549 and 3) HepG2 lysate with ALDH1A1 antibody. Expected molecular weight ~55 kDa.



ALDH1A1 Polyclonal Antibody WB Analysis of Human Liver Cancer, Cell Lines, Rat Tissues and Mouse Lung. Western blot analysis of human hepatocellular carcinoma tumor tissue (lane 1), adjacent non-tumor liver tissue (lane 2), HepG2 cells (lane 3), A549 cells (lane 4), rat liver (lane 5), rat kidney (lane 6), and mouse lung (lane 7) using ALDH1A1 Polyclonal Antibody at 0.5 ug/ml. A prominent immunoreactive band is detected near 55 kDa across all seven samples, consistent with the predicted molecular weight of ALDH1A1, a Cancer Stem Cell and Retinoic Acid Metabolism Marker.



ALDH1A1 Polyclonal Antibody WB Analysis of Wild-Type and ALDH1A1 Knockout A549 Cells. Western blot analysis of human A549 wild-type (WT, lane 1) and ALDH1A1 knockout (KO, lane 2) whole-cell lysates using ALDH1A1 Polyclonal Antibody at 0.5 ug/ml. A prominent immunoreactive band near 55 kDa is detected in WT lysate and is absent from the KO sample, supporting antibody specificity for ALDH1A1, a Cancer Stem Cell and Retinoic Acid Metabolism Marker. GAPDH serves as the loading control.

Description

Aldehyde dehydrogenase 1 family member A1 (ALDH1A1) is a cytosolic NAD-dependent enzyme that catalyzes the oxidation of retinaldehyde and other reactive aldehydes into their corresponding carboxylic acids. ALDH1A1 Polyclonal Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker is useful for studying aldehyde detoxification, retinoic acid biosynthesis, epithelial differentiation, and stem cell-associated signaling pathways. ALDH1A1 belongs to the aldehyde dehydrogenase superfamily and is highly expressed in tissues with active metabolic and detoxification functions including liver, gastrointestinal epithelium, cornea, and certain stem cell-enriched cellular populations.

ALDH1A1 antibody, also known as Aldehyde dehydrogenase 1 antibody or Retinal dehydrogenase 1 antibody in the literature, recognizes a protein that plays an important role in cellular protection against oxidative and electrophilic stress. Through the generation of retinoic acid from retinaldehyde substrates, ALDH1A1 contributes to transcriptional regulation mediated by retinoic acid receptors and retinoid-responsive developmental pathways. The enzyme is localized primarily within the cytoplasm where it supports metabolic homeostasis and protects cells from toxic aldehyde accumulation generated during lipid peroxidation and xenobiotic metabolism.

ALDH1A1 has become widely recognized as a cancer stem cell marker in numerous tumor types including breast carcinoma, lung cancer, colorectal carcinoma, ovarian carcinoma, pancreatic cancer, and hepatocellular carcinoma.

Elevated ALDH1A1 expression has been associated with tumor initiation capacity, chemoresistance, metastatic progression, and poor clinical outcome in several malignancies. In immunohistochemistry studies, ALDH1A1 expression is commonly observed in epithelial cell populations and stem-like tumor compartments, making this target valuable for cancer pathology and tumor heterogeneity research. The enzyme has also been implicated in regulation of epithelial-to-mesenchymal transition, cellular plasticity, and resistance to oxidative injury within aggressive tumor subpopulations.

In normal tissues, ALDH1A1 participates in alcohol-derived aldehyde metabolism and detoxification processes that are particularly important in hepatic tissue. Strong hepatic expression is consistent with the established role of ALDH1A1 in intermediary metabolism and cellular defense against reactive aldehydes. Additional expression has been described in gastric and intestinal epithelium, ocular tissue, hematopoietic progenitors, and stem cell-associated niches. Because of its broad metabolic importance, ALDH1A1 is frequently studied in toxicology, developmental biology, regenerative medicine, and oncology research applications.

This rabbit polyclonal ALDH1A1 antibody supports multiple experimental workflows including western blotting, immunohistochemistry, immunofluorescence, and flow cytometry analysis. The broad human, mouse, and rat reactivity profile makes the antibody useful for comparative mammalian expression studies and translational disease models involving epithelial differentiation, retinoid metabolism, stem cell biology, and aldehyde detoxification pathways.

Metabolism-related aldehyde detoxification and retinoic acid signaling pathways involving ALDH1A1 are further highlighted in our Metabolism Antibodies page featuring targets associated with cellular bioenergetics, oxidative stress regulation, and metabolic disease research.

Application Notes

Optimal dilution of the ALDH1A1 Polyclonal Antibody / Cancer Stem Cell and Retinoic Acid Metabolism Marker should be determined by the researcher.

Immunogen

A human recombinant protein (amino acids T6-Q342) was used as the immunogen for the ALDH1A1 antibody.

Storage

After reconstitution, the ALDH1A1 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

Aldehyde dehydrogenase 1 antibody, Retinal dehydrogenase 1 antibody, ALDH1 antibody, Cancer stem cell marker antibody, Retinoic acid biosynthesis antibody

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