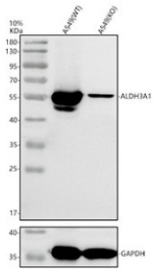
ALDH3A1 Antibody / Aldehyde Dehydrogenase 3A1 Polyclonal Antibody (FY13682)

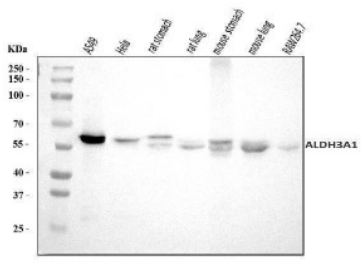
Catalog No.	Formulation	Size
FY13682	0.5mg/ml if reconstituted with 0.2ml sterile DI water	100 ug

Bulk quote request

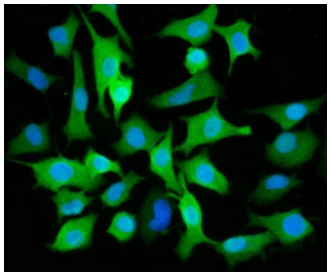
Species Reactivity	Human, Mouse, Rat
Format	Antigen affinity purified
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit Ig
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	P30838
Applications	Western blot: 0.5-1ug/ml Immunofluorescence: 5ug/ml ELISA: 0.1-0.5 ug/ml
Limitations	This ALDH3A1 Antibody / Aldehyde Dehydrogenase 3A1 Polyclonal Antibody is supplied exclusively for research use.



ALDH3A1 Antibody WB Analysis of Wild-Type and Knockout A549 Cells. Western blot analysis of human A549 wild-type (WT, lane 1) and ALDH3A1 knockout (KO, lane 2) whole-cell lysates using Aldehyde Dehydrogenase 3A1 Polyclonal Antibody. Two immunoreactive bands are detected in WT lysate, including a prominent band near 55 kDa and a weaker lower-molecular-weight band. The upper band is markedly reduced in KO lysate, while the lower band is no longer detected, supporting recognition of ALDH3A1-associated protein species. Alternative ALDH3A1 splice variants encoding shorter proteins have been documented in published studies, although the lower band has not been confirmed as a specific isoform. GAPDH serves as the loading control.



ALDH3A1 Antibody WB Analysis of Human A549 and HeLa Cells and Rat and Mouse Samples. Western blot analysis of human A549 (lane 1) and HeLa (lane 2) cell lysates, rat stomach (lane 3), rat lung (lane 4), mouse stomach (lane 5), mouse lung (lane 6), and mouse RAW264.7 cells (lane 7) using Aldehyde Dehydrogenase 3A1 Polyclonal Antibody. Immunoreactive bands are detected near 50-60 kDa across the tested samples, with the strongest signal in A549 lysate.



ALDH3A1 Antibody IF Staining of Human A549 Cells. Immunofluorescence analysis of human A549 cells using Aldehyde Dehydrogenase 3A1 Polyclonal Antibody at 5 ug/ml. Green fluorescence demonstrates predominantly cytoplasmic staining, with comparatively limited nuclear signal. Nuclei are counterstained blue with DAPI. Enzymatic antigen retrieval was performed for 15 minutes before antibody incubation.

Description

ALDH3A1 Antibody / Aldehyde Dehydrogenase 3A1 Polyclonal Antibody targets aldehyde dehydrogenase 3 family member A1 (ALDH3A1), a cytosolic enzyme involved in the oxidation of aldehydes to their corresponding carboxylic acids. ALDH3A1 belongs to the aldehyde dehydrogenase superfamily, whose members participate in cellular detoxification and the metabolism of endogenous and environmental compounds. This enzyme preferentially acts on certain aromatic and medium-chain aliphatic aldehydes, including reactive products generated during lipid peroxidation.

ALDH3A1 contributes to cellular protection against oxidative stress by metabolizing potentially harmful aldehydes produced during membrane lipid oxidation. Reactive aldehydes can form covalent adducts with proteins, nucleic acids, and other cellular components, disrupting normal biological functions. By facilitating aldehyde oxidation, ALDH3A1 helps limit the accumulation of these electrophilic compounds. Its enzymatic activity depends on nicotinamide adenine dinucleotide phosphate (NADP+) or nicotinamide adenine dinucleotide (NAD+) as an electron acceptor, connecting aldehyde metabolism with cellular redox processes.

One of the most distinctive characteristics of ALDH3A1 is its abundant expression in the mammalian cornea. The enzyme is considered a corneal crystallin because it contributes substantially to the soluble protein content of corneal epithelial cells. Beyond aldehyde detoxification, ALDH3A1 has been implicated in protection against ultraviolet-associated oxidative damage and maintenance of corneal transparency. Its high concentration may also contribute to the structural and optical properties of corneal tissue.

ALDH3A1 expression is regulated by cellular responses to environmental chemicals and oxidative stress. The aryl hydrocarbon receptor (AhR) signaling pathway and antioxidant-associated transcriptional mechanisms influence its expression in certain cellular contexts. Increased ALDH3A1 activity has also been investigated in cancer, where aldehyde detoxification may contribute to resistance against oxidative injury and selected chemotherapeutic agents. These associations vary according to tumor type and the metabolic characteristics of individual cells.

ALDH3A1 Antibody supports investigations into aldehyde metabolism, oxidative stress protection, and the biological functions of this enzyme in normal and transformed cells. Understanding ALDH3A1 expression provides insight into the relationship between reactive aldehyde detoxification, cellular redox balance, corneal physiology, and mechanisms of adaptation to chemical stress.

Explore additional enzymes involved in cellular detoxification, redox regulation, and intermediary metabolism in our Metabolism Antibodies collection.

Application Notes

Users should optimize the working dilution of the ALDH3A1 Antibody / Aldehyde Dehydrogenase 3A1 Polyclonal Antibody for their specific experimental setup.

Immunogen

The ALDH3A1 Antibody was generated using e. coli-derived human Aldehyde Dehydrogenase 3A1 recombinant protein (amino acids M1-H454).

Storage

Once reconstituted, refrigerate the ALDH3A1 Antibody at 4oC for no longer than one month. For extended storage, freeze aliquots at -20oC for up to six months and avoid repeated freeze-thaw cycles.

Alternate Names

Aldehyde dehydrogenase 3A1 antibody, Aldehyde dehydrogenase family 3 member A1 antibody, Aldehyde dehydrogenase 3 antibody, ALDH3 antibody, ALDH III antibody, ALDH3A1 enzyme antibody, Corneal aldehyde dehydrogenase antibody, Corneal crystallin ALDH3A1 antibody, Aldehyde dehydrogenase class 3 antibody, Aldehyde dehydrogenase 3A1 protein antibody

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