10320 Camino Santa Fe, Suite G
San Diego, CA 92121
Tel: 858.875.1900 Fax: 858.875.1999

# ALDH2 Antibody

Purified Mouse Monoclonal Antibody (Mab)
Catalog # AM1831a

## Product Information

| | |
|---|---|
| **Application** | IHC-P, FC, IF, WB, E |
| **Primary Accession** | P05091 |
| **Other Accession** | NP_000681 |
| **Reactivity** | Human, Rat, Mouse |
| **Predicted** | Bovine, Canine, Rabbit, Chicken |
| **Host** | Mouse |
| **Clonality** | Monoclonal |
| **Isotype** | IgG1,Igκ |
| **Clone Names** | 138CT22.3.8 |
| **Calculated MW** | 56381 |

## Additional Information

| | |
|---|---|
| **Gene ID** | 217 |
| **Other Names** | Aldehyde dehydrogenase, mitochondrial, ALDH class 2, ALDH-E2, ALDHI, ALDH2, ALDM |
| **Target/Specificity** | This ALDH2 Monoclonal antibody is generated from mouse immunized with ALDH2 recombinant protein. |
| **Dilution** | IHC-P~~1:100~500 FC~~1:10~50 IF~~1:10~50 WB~~1:100~1000 E~~Use at an assay dependent concentration. |
| **Format** | Purified monoclonal antibody supplied in PBS with 0.09% (W/V) sodium azide. This antibody is purified through a protein G column, followed by dialysis against PBS. |
| **Storage** | Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles. |
| **Precautions** | ALDH2 Antibody is for research use only and not for use in diagnostic or therapeutic procedures. |

## Protein Information

| | |
|---|---|
| **Name** | ALDH2 ( HGNC:404) |
| **Synonyms** | ALDM |
| **Function** | Mitochondrial aldehyde dehydrogenase with broad substrate specificity |

which participates in the detoxification of ethanol-derived acetaldehyde and endogenous aldehydes, including those arising from lipid peroxidation (PubMed:16956664, PubMed:22339434, PubMed:33355142, PubMed:39075523). The reaction mechanism involves a nucleophilic attack on the aldehyde substrate, resulting in formation of a thiohemiacetal intermediate. Subsequent hydride transfer to NAD+, yields a thioester intermediate which is hydrolyzed to the carboxylic acid product through activation of a water molecule by the catalytic glutamate (PubMed:19506075). In vivo, ALDH2 is required for the clearance of formaldehyde, a cytotoxic and carcinogenic endogenous metabolite that induces DNA damage (PubMed:33355142). It also catalyzes the oxidation of 3,4-dihydroxyphenylacetaldehyde (DOPAL), a reactive intermediate of dopamine catabolism, to 3,4-dihydroxyphenylacetate (DOPAC) (PubMed:16956664). ALDH2 may also catalyze the oxidation of 4-aminobutanal (gamma-aminobutyraldehyde) to 4-aminobutanoate (GABA), representing an alternative route for GABA biosynthesis from polyamine catabolism (By similarity). In vitro, ALDH2 catalyzes the oxidation of acrolein, malondialdehyde, and 4-hydroxynonenal (4-HNE) (PubMed:22339434). It also exhibits esterase activity that is enhanced by NAD+ but does not require it, although the physiological relevance of this activity remains unclear (PubMed:19506075).

**Cellular Location** Mitochondrion

## Background

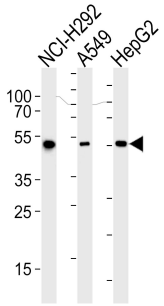
This protein belongs to the aldehyde dehydrogenase family of proteins. Aldehyde dehydrogenase is the second enzyme of the major oxidative pathway of alcohol metabolism. Two major liver isoforms of this enzyme, cytosolic and mitochondrial, can be distinguished by their electrophoretic mobilities, kinetic properties, and subcellular localizations. Most Caucasians have two major isozymes, while approximately 50% of Orientals have only the cytosolic isozyme, missing the mitochondrial isozyme. A remarkably higher frequency of acute alcohol intoxication among Orientals than among Caucasians could be related to the absence of the mitochondrial isozyme. This gene encodes a mitochondrial isoform, which has a low Km for acetaldehydes, and is localized in mitochondrial matrix.

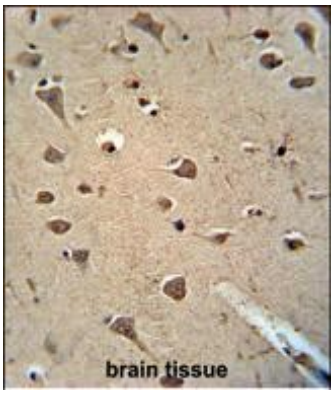
## References

Relationship between genetic polymorphisms of ALDH2 and ADH1B and esophageal cancer risk: a meta-analysis. Yang SJ, et al. World J Gastroenterol, 2010 Sep 7. PMID 20806441. Effects of alcohol-drinking behaviour and ADH1B and ALDH2 polymorphisms on basal DNA damage in human mononuclear cells as determined by the comet assay. Weng H, et al. Mutat Res, 2010 Aug 30. PMID 20685249. Evaluation of a brief web-based genetic feedback intervention for reducing alcohol-related health risks associated with ALDH2. Hendershot CS, et al. Ann Behav Med, 2010 Aug. PMID 20652463. Association of genetic polymorphisms of aldehyde dehydrogenase-2 with esophageal squamous cell dysplasia. Zhou YZ, et al. World J Gastroenterol, 2010 Jul 21. PMID 20632450. Variation at the NFATC2 Locus Increases the Risk of Thiazolinedinedione-Induced Edema in the Diabetes REduction Assessment with ramipril and rosiglitazone Medication (DREAM) Study. Bailey SD, et al. Diabetes Care, 2010 Jul 13. PMID 20628086.

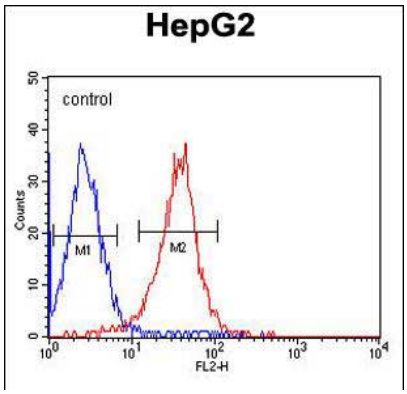
## Images

Western blot analysis of lysates from NCI-H292, A549, HepG2 cell line (from left to right), using ALDH2 Antibody(Cat. #AM1831a). AM1831a was diluted at 1:1000 at each lane. A goat anti-mouse IgG H&L(HRP) at 1:3000 dilution was used as the secondary antibody. Lysates at 35µg per lane.

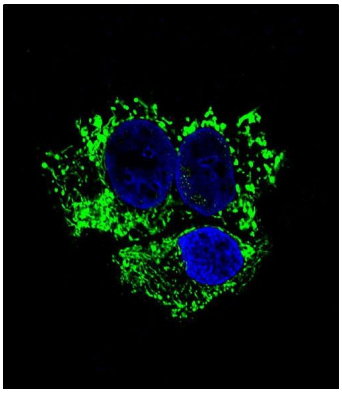



ALDH2 Monoclonal Antibody (Cat. #AM1831a) immunohistochemistry analysis in formalin fixed and paraffin embedded human brain tissue followed by peroxidase conjugation of the secondary antibody and DAB staining. This data demonstrates the use of the ALDH2 Monoclonal Antibody for immunohistochemistry. Clinical relevance has not been evaluated.




ALDH2 Monoclonal Antibody (Cat. #AM1831a) flow cytometric analysis of HepG2 cells (right histogram) compared to a negative control cell (left histogram).PE-conjugated goat-anti-mouse secondary antibodies were used for the analysis.



Confocal immunofluorescent analysis of ALDH2 Antibody (Cat#AM1831a) with HepG2 cell followed by Alexa Fluor® 488-conjugated goat anti-mouse lgG (green). DAPI was used to stain the cell nuclear (blue).

## Citations

- Aldehyde dehydrogenase 2 deficiency promotes atherosclerotic plaque instability through accelerating mitochondrial ROS-mediated vascular smooth muscle cell senescence.
- VHL deficiency augments anthracycline sensitivity of clear cell renal cell carcinomas by down-regulating ALDH2.
- UBE2C Is a Potential Biomarker of Intestinal-Type Gastric Cancer With Chromosomal Instability.

Please note: All products are 'FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC OR THERAPEUTIC PROCEDURES'.