# ALDH1L1 Mouse Monoclonal Antibody

# MCA-4A12


**Ordering Information**
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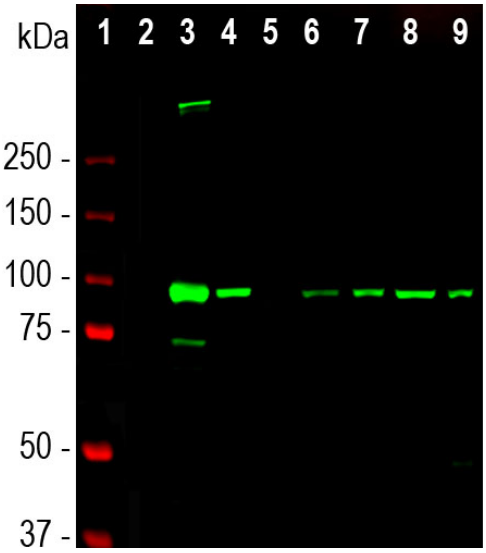
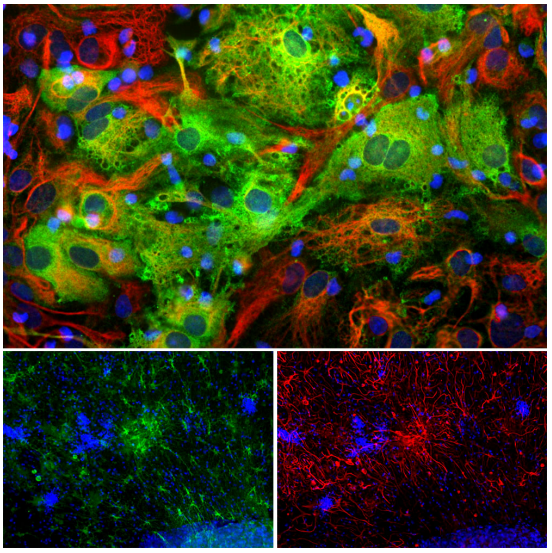
**HGNC Name:** *ALDH1L1*
**UniProt:** *O75891*
**RRID:** *AB_2572221*
**Immunogen:** *Amino acids 1-401 of human ALDH1L1 expressed in and purified from E. coli.*
**Format:** *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM $NaN_3$*
**Storage:** *Store at 4°C for one year, for longer term store at -20°C*
**Recommended dilutions:**
*WB: 1:5,000-1:10,000. IF/IHC: 1:1,000-1:2,000.*

| Applications | Host | Isotype | Molecular Wt. | Species Cross-Reactivity |
|---|---|---|---|---|
| WB, IF/ICC, IHC | Mouse | IgG2b | 100kDa | Hu, Rt, Ms |




Western blot analysis of rat and mouse tissue lysates using mouse mAb to ALDH1L1, MCA-4A12, dilution 1:5,000 in green: [1] protein standard (red), rat tissue lysates: [2] heart, [3] liver, [4] kidney, [5] lung, [6] brain, and [7] spinal cord; Also mouse tissue lysates: [8] brain, and [9] spinal cord. The band at 100kDa corresponds to ALDH1L1 protein. In line with published work, ALDH1L1 is a major protein of liver and CNS tissue.



Immunofluorescent analysis of mixed cortical neuron-glial cell culture from an E20 rat stained with mouse mAb to aldehyde dehydrogenase family 1 member L1 (ALDH1L1), MCA-4A12, dilution 1:1,000 in green, and costained with chicken pAb to vimentin, CPCA-Vim, dilution 1:5,000 in red. The blue is DAPI staining of nuclear DNA. MCA-4A12 antibody produces strong cytoplasmic staining of astrocytic glial cells, while the CPCA-Vim antibody labels the intermediate filament cytoskeleton in fibroblasts and other glial cells. Some cells, presumably developing asrocytes, are stained by both ALDH1L1 and vimentin and so appear yellow.

## Background:

Aldehyde dehydrogenase family 1, member L1 (ALDH1L1) is a cytosolic enzyme and one member of a large family of aldehyde dehydrogenases. ALDH1L1 catalyses the NADP(+) dependent oxidation of 10-formyltetrahydrofolate to tetrahydrofolate and Carbon dioxide (1). ALDH1L1 expression is highly tissue specific, with very high levels in the liver, representing up to 1% of the total pool of soluble cell proteins. Cahoy et al. used fluorescent activated cell sorting to isolate astrocytes from enhanced green fluorescent protein (GFP) expressing transgenic mice, with GFP expression being under the control of the S100β promoter, expected to direct GFP to astrocytes. They then created a transcriptome database of the gene expression levels using Affymetrix GeneChip arrays (2). They identified ALDH1L1 mRNA as very abundant and expressed only in astrocytes, suggesting that ALDH1L1 protein would be a expressed at high levels and only in astrocytes. Based on immunocytochemical studies they claimed that ALDH1L1 is more widely expressed in astrocytes throughout the brain, while the widely used astrocyte marker GFAP shows more predominant expression in white matter. The also claimed that AlDH1L1 expression gives a more detailed view of astrocyte morphology since it is expressed throughout the cell including fine protoplasmic protrusions. In contrast GFAP is found in the intermediate filament core of the astrocyte, and these filaments are not found in finer cytoplasmic protrusions. Loss of function or expression of ALDH1L1 is associated with decreased apoptosis, increased cell motility, and cancer progression, suggesting its role as a potential biomarker and a target in cancer therapy (3-5).

MCA-4A12 was made against a recombinant construct expressing the first 400 amino acids of human ALDH1L1 and is known to work on human, rat and mouse cells and tissue extracts. It stains the expected 100kDa band on western blots of crude tissue extracts cleanly and can be used to identify astrocytes in cell culture and sectioned material. EnCor used the same immunogen to generate a high quality rabbit polyclonal antibody to ALDH1L1, RPCA-ALDH1L1 and an alternate mouse monoclonal to ALDH1L1, MCA-2E7.

## References:


1. *Kisliuk RL. Folate biochemistry in relation to antifolate selectivity. In :Jackman AL, editor. Antifolate drugs in cancer therapy. Totowa, NJ: Humana Press; p. 13-36 (1999).*
2. *Cahoy JD, et al. A transcriptome database for astrocytes, neurons, and oligodendrocytes: a new resource for understanding brain development and function. J. Neurosci. 28:264-78 (2008).*
3. *Krupenko SA, Oleinik NV. 10-formyltetrahydrofolate dehydrogenase, one of the major folate enzymes, is down-regulated in tumor tissues and possesses suppressor effects on cancer cells. Cell Growth Differ. 13:227-36 (2002).*
4. *Rodriguez FJ, et al. Gene expression profiling of NF-1-associated and sporadic pilocytic astrocytoma identifies aldehyde dehydrogenase 1 family member L1 (ALDH1L1) as an underexpressed candidate biomarker in aggressive subtypes. J. Neuropath. Exp. Neurol. 67:1194-204 (2008).*
5. *Oleinik NV, Krupenko NI, Krupenko SA. Epigenetic Silencing of ALDH1L1, a Metabolic Regulator of Cellular Proliferation, in Cancers. Genes Cancer. 2:130-9 (2011).*



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***Abbreviation Key:***

***mAb—Monoclonal Antibody pAb—Polyclonal Antibody WB—Western Blot IF—Immunofluorescence ICC—Immunocytochemistry IHC—Immunohistochemistry E—ELISA Hu—Human Mo—Monkey Do—Dog Rt—Rat Ms—Mouse Co—Cow Pi—Pig Ho—Horse Ch—Chicken Dr—D. rerio Dm—D. melanogaster Sm—S. mutans Ce—C. elegans Sc—S. cerevisiae Sa—S. aureus Ec—E. coli.***

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