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Catalogue# RPCA-ALDH1L1: Rabbit Polyclonal Antibody to ALDH1L1

The Immunogen: Aldehyde dehydrogenases (ALDH) are a group of enzymes that catalyze oxidation (dehydrogenation) of aldehydes. To date, nineteen ALDH genes have been identified within the human genome. They belong to 15 families in ALDH superfamily. Among these, aldehyde dehydrogenase family 1, member 1 (ALDH1L1) catalyzes the conversion of 10-formyltetrahydrofolate, nicotinamide adenine dinucleotide phosphate (NADP+), and water to tetrahydrofolate, NADPH, and carbon dioxide. ALDH1L1 expression is tissue-specific and is highly expressed in the liver, representing up to 1% of the total pool of soluble cell proteins in the mammalian liver (1).

In an earlier study, Cahoy *et al.* applied FACS (Fluorescent-Activated Cell Sorting) to isolate astrocytes from EGFP (Enhanced Green Fluorescent Protein) transgenic-mouse, then created a transcriptome database of the expression levels of 20,000 genes by gene profiling of neurons, astrocytes and oligodendrocytes using Affymetrix GeneChip Arrays (2). They identified ALDH1L1 as a highly and specifically expressed gene in astrocytes. ALDH1L1 is more widely expressed throughout the brains, while astrocyte marker GFAP shows more predominant expression in white matter. In addition, loss of function or expression of ALDH1L1 is associated with decreased apoptosis, increased cell motility, and cancer progression, suggesting its role as a biomarker and a target in cancer therapy (3,4,5).

Polyclonal antibody RPCA-ALDH1L1 was raised against full length recombinant human ALDH1L1 expressed and purified from *E. coli.* The HGNC name for this protein is ALDH1L1.
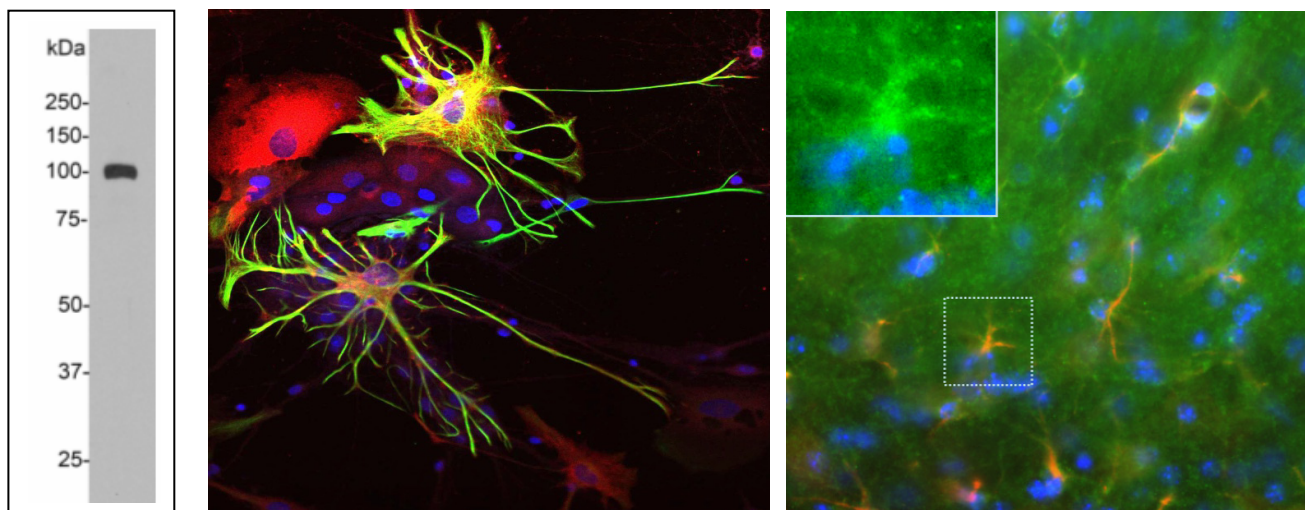
Left: Western blot of rat liver tissue homogenates blotted with RPCA-ALDH1L1. RPCA-ALDH1L1 binds strongly a band at ~100 kDa. **Middle:** Neuron-glial cell mixture cultures stained with RPCA-ALDH1L1 (red) and our monoclonal antibody against GFAP: **MCA-5C10** (green). Blue is a DNA stain. RPCA-ALDH1L1 stains astrocytes and excludes from neuron cells. ALDH1L1 stains the astrocytes cell body and processes, whereas GFAP labels the intermediate filament of the cytoskeleton in subset of astrocytes. Astrocytes are positive for both ALDH1L1 and GFAP appear yellow. ALDH1L1 also labels many astrocytes not labelled by GFAP, which appear as red. **Right**: Mouse brain sections (fixed by transcardial perfusion of 4% paraformaldehyde) stained with RPCA-ALDH1L1 antibody (green) and **MCA-5C10** antibody (red). Along the corpus callosum (white matter), RPCA-ALDH1L1 labels astrocytes that also heavily express GFAP. As the result, astrocytes in this area appear to be gold to yellow. Inset shows a magnified image of RPCA-ALDH1L1 staining. Nuclei are labeled with Dapi (blue).

Antibody characteristics: The antibody was raised against full length purified ALDH1L1 from *E. coli.* On blots, RPCA-ALDH1L1 reveals a prominent 100 kDa band, and on cells in tissue culture the antibody stains only in

astrocytes. The antibody is provided in the form of crude rabbit serum. This antibody recognizes ALDH1L1 specifically in western blots and in immunocytochemical experiments. Suitable positive control is rat liver lysates.

Suggestions for use: The serum can be used at dilutions of at least 1:2,000 in immunofluorescence experiments. In western blotting using chemiluminescence it can be used at dilutions of 1:5,000-10,000. Antibody preparation contains 10 mM sodium azide preservative (http://www.encorbio.com/MSDS/azide.htm for Material Safety Data Sheet).

Storage Instructions: Shipped on ice. Please store at 4°C for regular uses. For long term storage, please leave frozen at -20°C and avoid freeze/thaw cycles.

Limitations: This product is for research use only and is not approved for use in humans or in clinical diagnosis.

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). ISBN 0896035964.

2. Cahoy JD, Emery B, Kaushal A*, 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, Giannini C, Asmann YW*, 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 Neuropathol 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).

Price and Availability: We currently supply serum aliquots. Material is in stock and ready for immediate shipping.

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