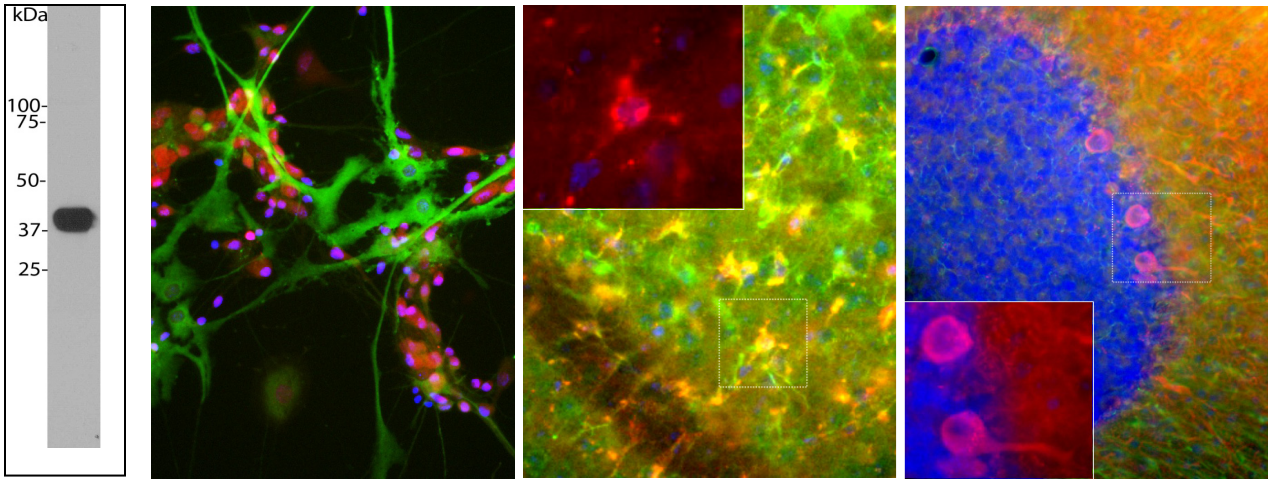
4949 SW 41st Blvd.
Suites 40 & 50
Gainesville, FL 32608
Tel: (352) 372 7022
Fax: (352) 372 7066
admin@encorbio.com

Catalogue# MCA-4A9: Mouse Monoclonal Antibody to Aldolase C

The Immunogen: Aldolases are glycolytic enzymes that catalyze the reversible aldol cleavage of fructose 1,6-bisphosphate and fructose-1-phosphate to dihydroxyacetone phosphate and either glyceraldehyde 3-phosphate or glyceraldehyde, respectively. Three aldolase isozymes are found in mammals, specifically aldolases A, B, and C, each of which is encoded by a separate gene. Aldolase A is generally considered to be a muscle enzyme. Northern analysis of cultured cells suggests that it is present in both neurons and glia (1). Aldolase B is considered to be a liver-specific enzyme and it is transcriptionally activated by signals from hormones and dietary factors (2). In the adult, aldolase C is the brain-specific isozyme, with low but detectable activity in fetal tissues (1, 3-6). Aldolase C shares 81% amino acid identity with aldolase A and 70% identity with aldolase B. Earlier studies using isozyme-specific antibodies report its location in gray matter astrocytes and cells of the pia mater (5, 8). *In situ* hybridization of mouse central nervous system using isozyme-specific probes revealed that aldolase A and C are expressed in complementary cell types: aldolase A mRNA is found in neurons; aldolase C message is detected in astrocytes, some cells of the pia mater, and Purkinje cells (9). Aldolase C can in some situations be used as an astrocyte marker. However Purkinje cells of the cerebellum contain high levels of the enzyme, so the enzyme is not totally astrocyte specific. MCA-4A9 was raised against N-terminal 20 amino acids of aldolase C protein, the sequence MPHSYPALSAEQKKELS, so that the epitope is unusually well known. The HGNC name for this protein is ALDOC.



Left: Blots of crude cow cerebellum homogenate blotted with MCA-4A9. The MCA-4A9 monoclonal binds strongly and cleanly to a band at about 40 kDa. **Middle Left:** View of mixed neuron/glial cultures stained with MCA-4A9 (green) and our rabbit antibody to NeuN/FOX3 antibody (**RPCA-FOX3**, red). MCA-4A9 antibody reveals strong cytoplasmic staining in astrocytes, while Rabbit Fox3/NeuN antibody shows nuclear and distal cytoplasmic staining in neuron cells and is complete absence of astrocytes. Blue is a DNA stain. **Middle Right and Right**: Mouse brain sections (fixed by transcardial perfusion with 4% paraformaldehyde) stained with MCA-4A9 (red) and our chicken anti-Vimentin **CPCA-Vim** antibody (green). In striatum (Middle Right), MCA-4A9 positive astrocytes are highly co-stained with CPCA-Vim and result in yellow to gold color. While in cerebellum (Right), MCA-4A9 positive Purkinje cells do not express vimentin and result in red color only. Insets show a higher magnification picture of MCA-4A9 single labeling in red. Nuclei are labeled with Dapi (blue).

Antibody characteristics: MCA-4A9 is a mouse IgG1 class antibody with a κ light chain. MCA-4A9 recognizes aldolase C specifically both in western blots and in immunocytochemical experiments. On blots MCA-4A9 reveals a prominent 40 kDa band.

Suggestions for use: The antibody is protein G purified from tissue culture supernatant and is diluted in phosphate buffered saline at 1 mg/mL and the preparation also contains 50% glycerol stabilizer. The antibody solution can be used at dilutions 1:1,000-2,000 for immunofluorescence. For western blots try at 1:2,000-5,000. A suitable control tissue is brain cell lysates.

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.

OMIM link: http://omim.org/entry/103870

References:

1. Popovici T, Berwald-Netter Y, Vibert M, Kahn A, Skala H. Localization of aldolase C mRNA in brain cells. FEBS Lett. 268, 189-193 (1990).

2. Weber A, Marie J, Cottereau D, Simon M, Besmond C, Dreyfus J. & Kahn A. Dietary Control of Aldolase B and L-type Pyruvate Kinamse RNAs in Rat.Â J. Biol. Chem 259, 1798-1802 (1984).

3. Mukai T, Yatsuki H, Masuko S, Arai Y, Joh K & Hori K. The structure of the brain-specific rat aldolase C gene and its regional expression. Biochem. Biophys. Res. Commun. 174, 1035-1042 (1991).

4. Royds J, Ironside J, Warnaar S, Taylor C & Timperle W. Monoclonal antibody to aldolase C: a selective marker for Purkinje cells in the human cerebellum. Neuropathol. Appl. Neurobiol. 13, 11-21(1987).

5. Thompson R., Kynoch P. Willson V. Cellular localization of aldolase C subunits in human brain. Brain Res. 232, 489-493 (1982).

6. Schapira F, Reuber M, Hatzfeld A. Resurgence of two fetal-type of aldolases (A and C) in some fast-growing hepatomas. Biochem. Biophys. Res. Commun. 40, 321-327(1970).

7. Arai Y, Kajihara S, Masuda J, Ohishi S, Zen K, Ogata J. Mukai T. Position-independent, high-level, and correct regional expression of the rat aldolase C gene in the central nervous system of transgenic mice. Eur. J. Biochem. 221, 253-260 (1994).

8. Wachsmuth E, Thorner M. & Pfleiderer G. The cellular distribution of aldolase isozymes in rat kidney and brain determined in tissue sections by the immuno-histochemical method. Histochemistry, 45, 143-161 (1975).

9. Walther EU, Dichgans M, Maricich SM, Romito RR, Yang F, Dziennis S, Zackson S, Hawkes R, Herrup K. Genomic sequences of aldolase C (Zebrin II) direct *lacZ* expression exclusively in non-neuronal cells of transgenic mice. Proc Natl Acad Sci U S A. Mar 3;95(5):2615-20(1998).