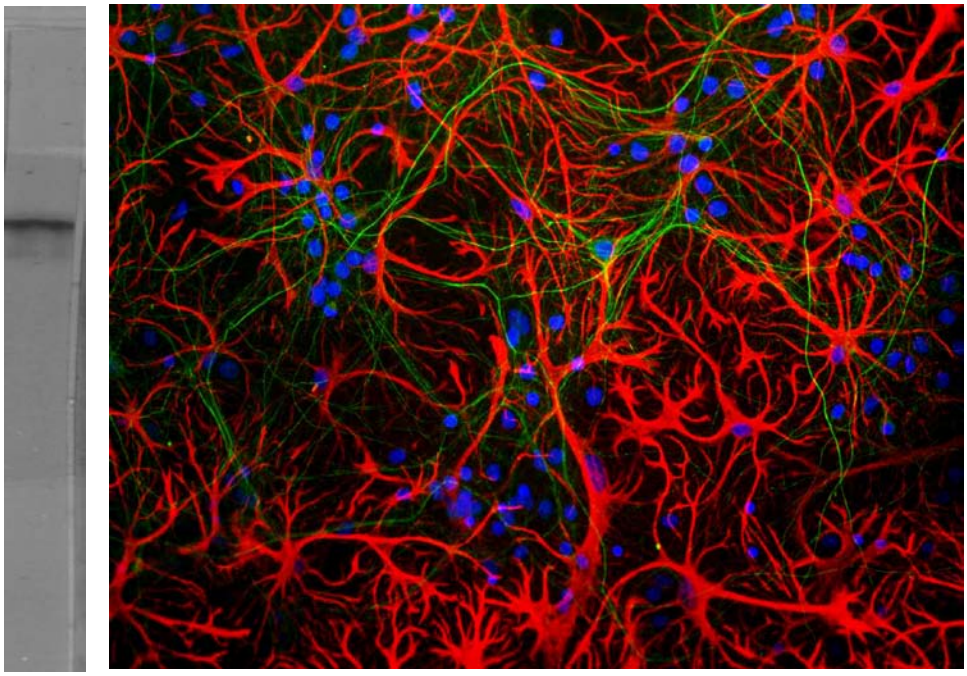
4949 SW 41st Blvd.
Suites 40 & 50
Gainesville, FL 32608
Tel: (352) 372 7022
Fax: (352) 372 7066
admin@encorbio.com

Catalogue# MCA-5C10-AP, -ASC, or -TCS: Glial Fibrillary Acidic Protein Monoclonal Antibody 5C10 - GFAP

The Immunogen: Glial Fibrillary Acidic Protein (GFAP) was discovered by Amico Bignami and coworkers as a major fibrous protein of multiple sclerosis plaques (1). It was subsequently found to be a member of the 10nm or intermediate filament protein family, specifically the intermediate filament protein family Class III, which also includes peripherin, desmin and vimentin. The GFAP protein runs on gels as a ~50kDa protein, usually associated with somewhat lower molecule weight bands which are alternate transcripts from the single gene. The HGNC nomenclature for this protein is, perhaps not surprisingly, GFAP. GFAP is strongly and specifically expressed in astrocytes and certain other astroglia in the central nervous system, in satellite cells in peripheral ganglia, and in non-myelinating Schwann cells in peripheral nerves (2,3).

Astrocytes respond to many damage and disease states resulting in “astrogliosis” or the presence of a “glial response”. GFAP antibodies are widely used to see the reactive astrocytes which form part of this response, since reactive astrocytes stain much more strongly with GFAP antibodies than normal astrocytes. GFAP also forms a major component of the so-called glial scar, an astrocyte rich structure apparently forming part of the barrier to nerve fiber regeneration following damage in the central nervous system (4).

Neural stem cells frequently strongly express GFAP. Antibodies to GFAP are therefore very useful as markers of normal and reactive astrocytic cells and neural stem cells. Finally, Alexander’s disease was recently shown to be caused by point mutations in protein coding region of the GFAP gene (5). All forms of Alexander disease are characterized by the presence of Rosenthal fibers, which are GFAP containing cytoplasmic inclusions found in astrocytes. Our antibody produces strong and specific staining on western blots, in immunocytochemistry (see below) and on formalin fixed paraffin embedded sections (see http://encorbio.com/Data/GFAP.html).



Left: Strip blot of rat spinal cord protein extract stained with MCA-5C10. A prominent band at about 50 kDa corresponds to the major isoform of GFAP. **Right:** Mixed neuron-glial cultures stained with MCA-5C10, and chicken polyclonal antibody to neurofilament NF-L CPCA-NF-L (green). The GFAP antibody stains the network of astrocytes in these cultures, while the NF-L antibody stains neurons and their processes. The blue channel shows the localization of DNA.

Antibody characteristics: MCA-5C10 is a IgG1 class antibody with a κ light chain and was raised against a preparation of purified pig spinal cord GFAP. It reacts with GFAP from human, cow, pig, mouse, rat and all other mammalian and avian species tested to date. It is strong and clean on western blots and works well on frozen sections, cells in tissue culture and on formalin fixed histological sections.

Suggestions for use: We have three preparations of this antibody: ascites fluid, concentrated tissue culture supernatant and affinity purified antibody at 1 mg/mL in PBS. For immunofluorescence or immunohistochemistry use MCA-5C10 diluted to 1/1,000. For western blots try MCA-5C10 at dilutions of 1/5,000. Store at 4°C short term or -20°C long term. Avoid repeated freezing and thawing.

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

References:

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4. Fitch MT, Silver J. CNS injury, glial scars, and inflammation: Inhibitory extracellular matrices and regeneration failure. Exp Neurol. 209:294-301 2008.

5. Brenner M, Johnson AB, Boespflug-Tanguy O, Rodriguez D, Goldman JE, Messing A. Mutations in GFAP, encoding glial fibrillary acidic protein, are associated with Alexander disease. Nat Genet 27:117-20 2001