Myelin Basic Protein (MBP) Mouse Monoclonal Antibody

MCA-7G7

Ordering Information
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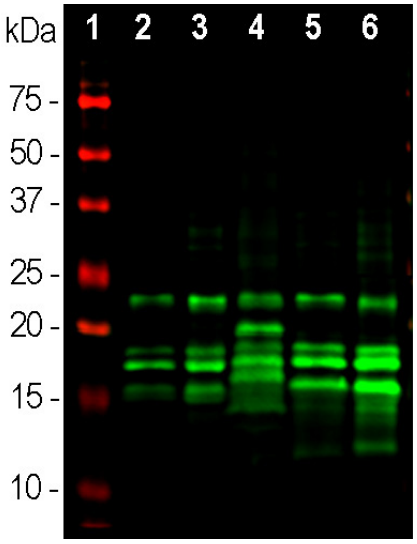
HGNC Name: *MBP*
UniProt: *P02687*
RRID: *AB_2572353*
Immunogen: *Purified myelin basic protein isolated from bovine brain, epitope is in peptide TPPPSQGKG, amino acids 125-133 of the human 21.5kDa sequence*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Store at 4°C for short term, for longer term at -20°C.*
Recommended dilutions:
WB: 1:10,000 -1:20,000. IF/ICC 1:2,000-5,000. IHC: 1:10,000.

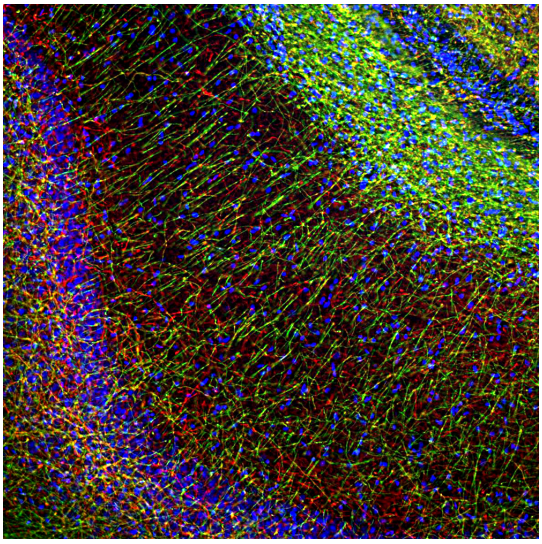
References:

1. Eylar EH, et al. Basic A1 protein of the myelin membrane. The complete amino acid sequence. J. Biol. Chem. 246:5770-84 (1971).
2. Marty MC, et al. The myelin basic protein gene is expressed in differentiated blood cell lineages and in hemopoietic progenitors. PNAS 99:8856-61 (2002).
3. Libbey JE, Fujinami RS. Experimental Autoimmune Encephalomyelitis as a Testing Paradigm for Adjuvants and Vaccines. Vaccine 29:3356–62 (2011).
4. Wucherpfennig KW, Strominger JL. Molecular mimicry in T cell-mediated autoimmunity: Viral peptides activate human T cell clones specific for myelin basic protein. Send to Cell 80:695-705 (1995).
5. Berger RP, et al. Serum neuron-specific enolase, S100B, and myelin basic protein concentrations after inflicted and noninflicted traumatic brain injury in children. J. Neurosurg. 103:61-8 (2005).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Mouse	IgG1 heavy, κ light	14-21.5kDa rodent, 17.2-21.5kDa human	Hu, Rt, Ms, Co, Pi, Ho



Western blot analysis of different tissue lysates using mouse mAb to MBP, MCA-7G7, dilution 1:20,000 in green: [1] protein standard (red), [2] rat brain, [3] rat spinal cord, [4] rat sciatic nerve, [5] mouse brain, [6] mouse spinal cord. Multiple bands at 14kDa, 17kDa, 18.5kDa to 21.5kDa are the alternate transcripts of MBP. Other bands are proteolytic fragments of the MBP protein.



Immunofluorescent analysis of rat hippocampal section stained with mouse mAb to myelin basic protein (MBP), MCA-7G7, dilution 1:5,000 in green, and costained with rabbit pAb to neurofilament NF-H, RPCA-NF-H, dilution 1:2,000, in red. The MBP antibody stains oligodendrocyte cell bodies and the myelin sheathes around axons, while the NF-H antibody labels the axons themselves.

Background:

Myelin Basic Protein (MBP) is one of the major proteins of the myelin sheath surrounding axons in the nervous system. Since it is of relatively low molecular weight and high abundance the protein sequence was determined from purified protein over 30 years ago (1). The protein is made by oligodendrocytes in the central and nervous system, so antibodies to MBP are good markers of this cell type. In the peripheral nervous system MBP is expressed by myelinating Schwann cells so this antibody can be used to identify these cells in culture or sectioned materials. In the central nervous system four different forms of the protein made by alternate transcription from a single gene, the protein products having molecular weights of 21.5, 20.5, 18.5, and 17.2kDa in humans. The single gene of rodents also produces 4 different proteins but the splicing mechanism is different producing four forms of slightly different sizes, 21.5, 18.5, 17 and 14kDa. Some interest has focused on MBP as a potentially significant auto-antigen involved in mouse models of multiple sclerosis (MS, 3) and in human patients (4). Detection of MBP released into blood and CSF has some potential as a surrogate biomarker of demyelination and axonal loss in MS and other relevant damage and disease states (e.g. 5).

The MCA-7G7 antibody was made against a preparation of MBP purified biochemically from bovine brain. It can be used to identify oligodendrocytes and Schwann cells in neural cell culture, to visualize myelin sheaths and myelinating cells in sectioned material and to probe western blots for MBP gene products. The antibody is also rather insensitive to aldehyde fixation and so can be used in immunohistochemistry of paraffin sections. The MCA-7G7 antibody binds all four of the CNS MBP isoforms, so that the epitope for the antibody is located in the "core" shared by all four gene products. Further mapping localizes the epitope to peptide TPPPSQGKG, amino acids 125-133 of the human 21.5kDa sequence. The data was produced with overlapping peptides which suggests that the last four amino acids, SQGKG, are likely to be key elements of the epitope. This peptide is invariant in rat, mouse, cow and many other species, so this antibody will have wide applicability. In contrast our alternate mouse monoclonal MCA-7D2 binds only the 21.5kDa and 18.5kDa rat MBP isotypes but all bovine and human isotypes, mapping the epitope to AEGQRPGFGYGGRASDYKSAHKGFKGVDAQGTLSKIFKLG, amino acids 145-184 of the human 21.5kDa sequence. A sequence alignment of the four CNS MBP isotypes in human and rat can be downloaded from here. The antibody works well for western blotting and for IF, ICC and IHC (for IHC see data under "Additional Info" tab).

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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