

Ordering Information
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HGNC Name: MAP2
UniProt: P11137
RRID: AB_2572215
Immunogen: Full length recombinant human MAP2D protein Prot-r-MAP2D expressed in and purified from *E. coli*.
Format: Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaCl.
Storage: Stable at 4°C for one year, for longer term store at -20°C
Recommended dilutions:
 WB: 1:5,000-1:10,000. IF/ICC and IHC: 1:5,000-10,000.

References:

1. Dehmelt H, Halpain S. The MAP2/Tau family of microtubule-associated proteins. *Genome Biol.* 6:204 (2005).
2. Nunez J. Immature and mature variants of MAP2 and tau proteins and neuronal plasticity. *Trends Neurosci.* 11:477-9 (1998).
3. Vallee R. A taxol-dependent procedure for the isolation of microtubules and microtubule-associated proteins (MAPs). *J. Cell Biol.* 92:435-42 (1992).
4. Goetz AK, et al. Temporally restricted substrate interactions direct fate and specification of neural precursors derived from embryonic stem cells. *PNAS* 103:11063-8 (2006).
5. Walton NM, et al. Gliotypic neural stem cells transiently adopt tumorigenic properties during normal differentiation. *Stem Cells* 27:280-9 (2009).
6. Gasser A, et al. An ankyrinG-binding motif is necessary and sufficient for targeting Nav1.6 sodium channels to axon initial segments and nodes of Ranvier. *J. Neurosci.* 32:7232-43 (2012).
7. Rush AM, et al. Differential modulation of sodium channel Nav1.6 by two members of the fibroblast growth factor homologous factor 2 subfamily. *Eur. J. Neurosci.* 23:2551-62 (2006).
8. Eckenstein FP, McGovern T, Kern D, Deignan J. Neuronal vulnerability in transgenic mice expressing an inducible dominant-negative FGF receptor. *Exp. Neurol.* 198:338-49 (2006).
9. Tompa P. Intrinsically unstructured proteins. *Trends Biochem. Sci.* 27:527-33 (2002).

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
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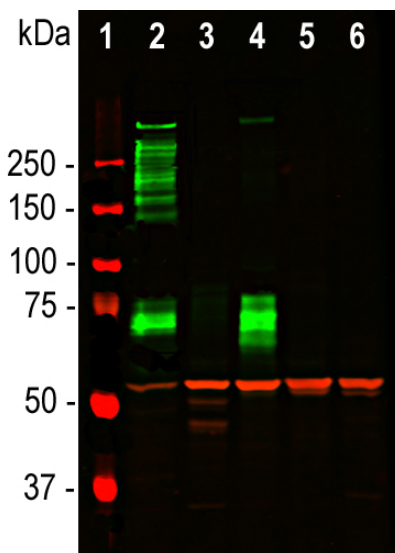
WB, IF/ICC, IHC

Mouse

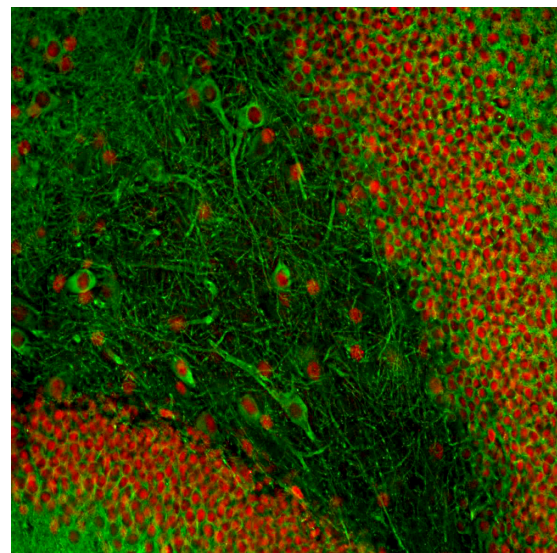
IgG1

MAP2A/B ~280 kDa, MAP2C/D ~70kDa by SDS-PAGE

Hu, Rt, Ms



Western blot analysis of tissue and cell lysates using mouse mAb to MAP2C/D, MCA-2C4, dilution 1:5,000 in green, and chicken pAb to vimentin, CPCA-Vim, dilution 1:5,000 in red. [1] protein standard, [2] rat whole brain lysate, [3] HeLa, [4] SH-SY5Y, [5] HEK293 and [6] NIH-3T3 cell lysates. A band at about 280kDa is full length intact MAP2A/2B isotypes while bands at about 70kDa represent MAP2C/D isotypes. Multiple bands in between are likely *in vivo* fragments of MAP2A/B. Only the SH-SY5Y cells, which have neuronal properties express MAP2 protein. The CPCA-Vim antibody binds to a single band at ~50kDa present in all preparations.



Immunofluorescent analysis of adult rat hippocampus section stained with mouse mAb to MAP2A/B/C/D, MCA-2C4, dilution 1:5,000 in green, and chicken pAb to FOX2, CPCA-FOX2, dilution 1:2,000, in red. Following transcardial perfusion of rat with 4% paraformaldehyde, brain was post fixed for 24 hours, cut to 45µM, and free-floating sections were stained with above antibodies. MCA-2C4 antibody labels all MAP2 protein isotypes expressed in neuronal perikarya and dendrites. The FOX2 antibody stains the nuclei of most neuronal cells.

Background:

Microtubules are 25nm diameter protein rods found in most eukaryotic cells and are associated with a family of proteins called microtubule associated proteins (MAPs). MAPs play a crucial role in the regulation of microtubule dynamics and interactions *in vivo*. MAP2 was originally named as one of the higher molecular weight MAPs with an SDS-PAGE molecular weight of about 280kDa (1-3). There is a single mammalian MAP2 gene which may generate two high molecular weight proteins of ~280kDa on SDS-PAGE named MAP2A and MAP2B and multiple lower molecular weight forms usually named MAP2C and MAP2D which run on SDS-PAGE gels at 60-70kDa. The lower molecular weight forms are found in neurons early in development, but as the animal matures they are replaced by the higher molecular weight forms (1,2). MAP2 isoforms are expressed only in neurons in perikarya and dendrites, so MAP2 antibodies are useful for identifying neurons in cell culture and sectioned material (4-8). MAP2C and D contain an "intrinsically unstructured region", one of the prototypes for this widespread type of protein sequence (9). Since MAP2C and D are expressed earlier in development than MAP2A and B this antibody can be used for monitoring early neuronal development, though it is also useful as a general marker for neurons and dendrites in mature tissues.

This antibody was made against a recombinant full length form of human MAP2D and was found to bind all four MAP2 gene products meaning that it binds to the shared core region of these molecules. EnCor markets other mouse monoclonal antibodies specific for MAP2A and MAP2B MCA-4H5 and MCA-5H11. EnCor also markets MAP2A and MAP2B chicken and goat polyclonal antibodies CPCA-MAP2 and GPCA-MAP2.

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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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