MeCP2
Mouse Monoclonal Antibody

MCA-4F11

Ordering Information
Web *www.encorbio.com*
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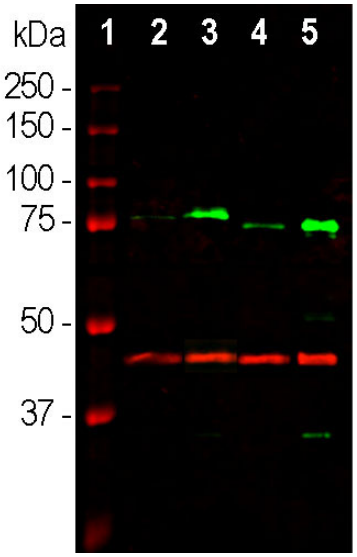
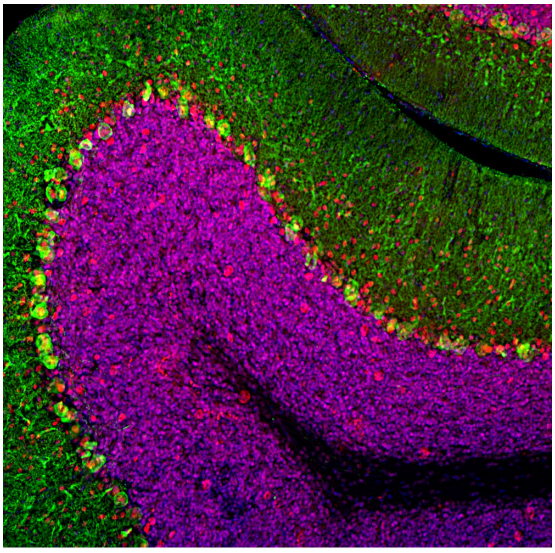
HGNC Name: *MECP2*
UniProt: *P51608*
RRID: *AB_2737435*
Immunogen: *Full length human recombinant MeCP2 expressed in and purified from E. coli.*
Format: *Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Stable at 4°C for one year, for longer term store at -20°C*
Recommended dilutions:
WB: 1:5,000-10,000 IF/ICC or IHC: 1:1,000-5,000

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Mouse	IgG1	70-75kDa by SDS-PAGE	Hu, Rt, Ms



Western blot analysis of tissue lysates using mouse mAb to MeCP2, MCA-4F11, dilution 1:1,000 in green: [1] protein standard (red), [2] rat whole brain, [3] nuclear fraction of rat brain, [4] mouse whole brain, [5] nuclear fraction of mouse brain lysate. Strong band at about 75kDa in rat and slightly lower in mouse nuclear enriched fractions corresponds to the MeCP2 protein. The same blot was simultaneously probed with chicken pAB to GAP43, CPCA-GAP43, which detects GAP43 protein in all preparations with apparent molecular weight of 43kDa.



Immunofluorescent analysis of rat cerebellum section stained with mouse mAb to MeCP2, MCA-4F11, dilution 1:500 in red and costained with chicken pAb to calbindin CPCA-Calb, dilution 1:2,000, in green. The blue is DAPI staining of nuclear DNA. Following transcardial perfusion of rat with 4% paraformaldehyde, brain was post fixed for 1 hour, cut to 45µM, and free-floating sections were stained with the above antibodies. The MeCP2 antibody specifically labels nuclei of neuronal cells to a variable degree, while calbindin is expressed in the dendrites and perikarya of Purkinje cells in the molecular layer of cerebellum.

Background:

Methyl-CpG Binding Protein 2 (MeCP2) is widely expressed in tissues and particularly heavily in neurons. It is a nuclear protein which was found to bind methylated cytosines in CpG islands in DNA, but which may also bind hydroxymethyl cytosine residues (1-3). Methyl and hydroxymethyl cytosines are generally found in regions of DNA regulating the expression of specific genes and MeCP2 is thought to function as a gene regulator, though it may have other functions. The MeCP2 protein contains one methyl-CpG binding domain and two AT hook domains, highly basic peptides which bind AT rich DNA sequences. The MeCP2 gene, *MECP2* is located on the X-chromosome and loss of function mutations of the gene cause Rett syndrome, a relatively rare neurodevelopmental, autistic disorder which presents almost exclusively in females, since similar mutation of *MECP2* in males is almost invariably lethal (3). Rett patients are apparently normal at birth but develop neurological problems over the period when extensive synaptogenesis is occurring, which coincides with the expression of high levels of MeCP2 in normal brain. The Rett brain shows smaller more densely packed neurons with less extensive dendritic branching (2). Duplication of the MECP2 gene was found to be the cause of a different neurodevelopmental disorder referred to a *MECP2* duplication syndrome (4). Levels of MeCP2 normally alter dynamically and the protein is regulated by phosphorylation on multiple sites (5-7).

The MCA-4F11 antibody was made against full length recombinant human MeCP2 expressed in and purified from *E. coli* and can be used to identify neurons transiently expressing high levels of this nuclear protein. The antibody works well for western blotting and for IF, ICC and IHC (see data under "Additional Info" tab). We also supply rabbit and chicken polyclonal antibodies to the same protein, RPCA-MeCP2 and CPCA-MeCP2.

References:

1. Klose RJ, et al. DNA binding selectivity of MeCP2 due to a requirement for A/T sequences adjacent to methyl-CpG. Mol. Cell 19:667–78 (2005).
2. Amir RE, et al. Rett syndrome is caused by mutations in X-linked MECP2, encoding methyl-CpG-binding protein 2. Nat. Genet. 23:185–8 (1999).
3. Pohodich AE, Zoghbi HY. Rett syndrome: disruption of epigenetic control of postnatal neurological functions. Hum. Mol. Genet. 24:R10-6 (2010).
4. Ramocki MB, Tavyev YJ, Peters SU. The MECP2 duplication syndrome. Am. J. Med. Genet. A. 152A:1079-88 (2010).
5. Zhou Z, et al. Brain-specific phosphorylation of MeCP2 regulates activity dependent Bdnf transcription, dendritic growth, and spine maturation. Neuron 52:255–69 (2006).
6. Deng JV, et al. MeCP2 in the nucleus acumbens contributes to neural and behavioral responses to psychostimulants. Nat. Neurosci. 13:1128-36 (2010).
7. Tao J, et al. Phosphorylation of Mecp2 at Serine 80 regulates its chromatin association and neurological function. PNAS 24:106 (2009).

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.