CNP
Rabbit Polyclonal Antibody

RPCA-CNP

Ordering Information
Web *www.encorbio.com*
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Phone *352-372-7022*
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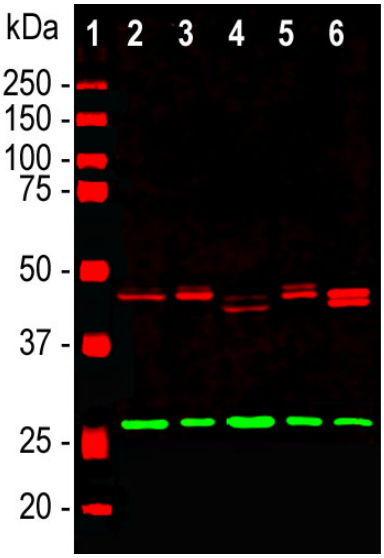
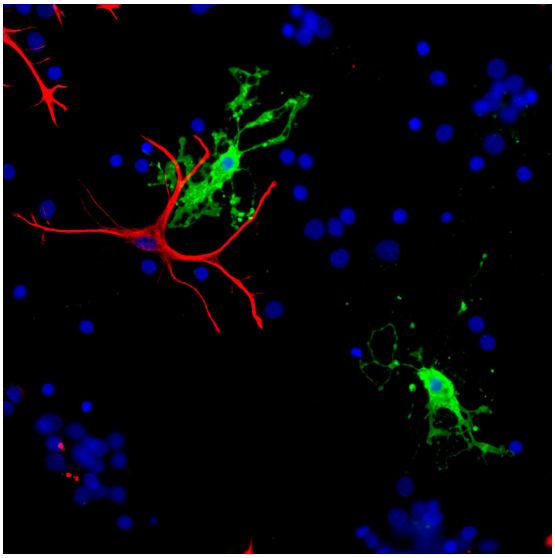
HGNC Name: *CNP*
UniProt: *PO9543*
RRID: *AB_2572252*
Immunogen: *Full length human recombinant protein expressed in E. coli*
Format: *Serum plus 5mM $NaN3_3$*
Storage: *Store at 4°C for short term, for longer term at -20°C*
Recommended dilutions:
WB:1:1000-5,000 IF/ICC: 1:1,000-2,000

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC, IHC	Rabbit		46, 48kDa	Hu, Rt, Ms



Western blot analysis of different tissue lysates using rabbit pAb to CNP, RPCA-CNP, dilution 1:5,000 in red: [1] protein standard (red), [2] rat brain, [3] rat spinal cord, [4] mouse brain, [5] mouse spinal cord, and [6] cow spinal cord. Double bands at 46 and 48kDa mark correspond to the two isotypes of the CNP protein. The blot was simultaneously probed with mouse mAb to calretinin, MCA-6A9, dilution 1:2,000, in green. The single band at 29kDa corresponds to the calretinin protein.



Immunofluorescent analysis of cortical neuron-glial cell culture from E20 rat stained with rabbit pAb to CNP, RPCA-CNP, dilution 1:1,000 in green, and costained with mouse mAb to GFAP, MCA-5C10, dilution 1:1,000 in red. The blue is DAPI staining of nuclear DNA. The CNP antibody stains the myelin producing cells, oligodendrocytes in this part of the CNS, while the GFAP antibody stains astroglia.

Background:

The 2′,3′-cyclic nucleotide 3′-phosphodiesterase (CNP), is an enzyme which catalyzes the hydrolysis of 2′, 3′-cyclic nucleotides to 2′-nucleotides. These cyclic nucleotides are structurally different from the better known and studied 3′-5′-cyclic nucleotides of which the best known example is cyclic AMP. CNP has two isoforms, CNPase 1 (46kDa) and CNPase 2 (48kDa), which are encoded separately by different promoters of the same gene (1). These enzymes are present in very high levels in brain and peripheral nerve, makes up 4% of total CNS myelin protein. They are found almost exclusively in oligodendrocytes and Schwann cells, appearing early in oligodendrocyte development, earlier than most other myelin specific proteins (2). Antibodies to CNP have been very useful as a marker for these particular cell types. CNP is thought to play a critical role in the events leading up to myelination, for the oligodendrocytes overexpressing CNP appear to mature earlier in development, resulting in earlier maximum gene expression for myelin basic proteins (3). It has been reported that CNP is also associated with microtubules in brain tissue and may promote microtubule assembly. CNP can link tubulin to cellular membranes, and may regulate cytoplasmic microtubule distribution (4). In various diseases, neurological mutants, and in experimental conditions in which myelin is reduced, CNP levels may also be severely reduced. Decreased brain levels of CNP have also been reported in Down syndrome and Alzheimer's disease (5).

The RPCA-CNP antibody was made against the full length recombinant form of human CNP and can be used to identify myelinating cells in cell culture and in sections and to trace axonal projections in sectioned material. The same recombinant protein was used to generate mouse monoclonal anti CNP MCA-1H10 and chicken and goat polyclonal anti CNP, CPCA-CNP and GPCA-CNP. Like RPCA-CNP, these antibodies are excellent markers of myelin and myelinating cells and recognize CNP cleanly on western blots.

References:

1. Monoh K, Kurihara T, Sakimura K, Takahashi Y. Structure of mouse 2′,3′-cyclic-nucleotide 3′-phosphodiesterase gene. BBRC 165:1213-20 (1989).
2. Kasama-Yoshida H, et al. A comparative study of 2′,3′-cyclic-nucleotide 3′-phosphodiesterase in vertebrates: cDNA cloning and amino acid sequences for chicken and bullfrog enzymes. J. Neurochem. 69:1335–42 (1997).
3. Gravel M, et al. Overexpression of 2′,3′-cyclic nucleotide 3′-phosphodiesterase in transgenic mice alters oligodendrocyte development and produces aberrant myelination. Mol. Cell. Neurosci. 6:453-66 (1996).
4. Bifulco M, Laezza C, Stingo S, Wolff J. 2′,3′-Cyclic nucleotide 3′-phosphodiesterase: a membrane-bound, microtubule-associated protein and membrane anchor for tubulin. PNAS 99:1807–11 (2001).
5. Vlkolinský R, Cairns N, Fountoulakis M, Lubec G. Decreased brain levels of 2′,3′-cyclic nucleotide-3′-phosphodiesterase in Down syndrome and Alzheimer's disease. Neurobiol. Aging 22:547-53 (2001).
6. Park Y-G, et al. Protection of tissue physicochemical properties using polyfunctional crosslinkers. Nature Biotechnology 10.1038/nbt.4281 doi:10.1038/nbt.428137 (2018).

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.