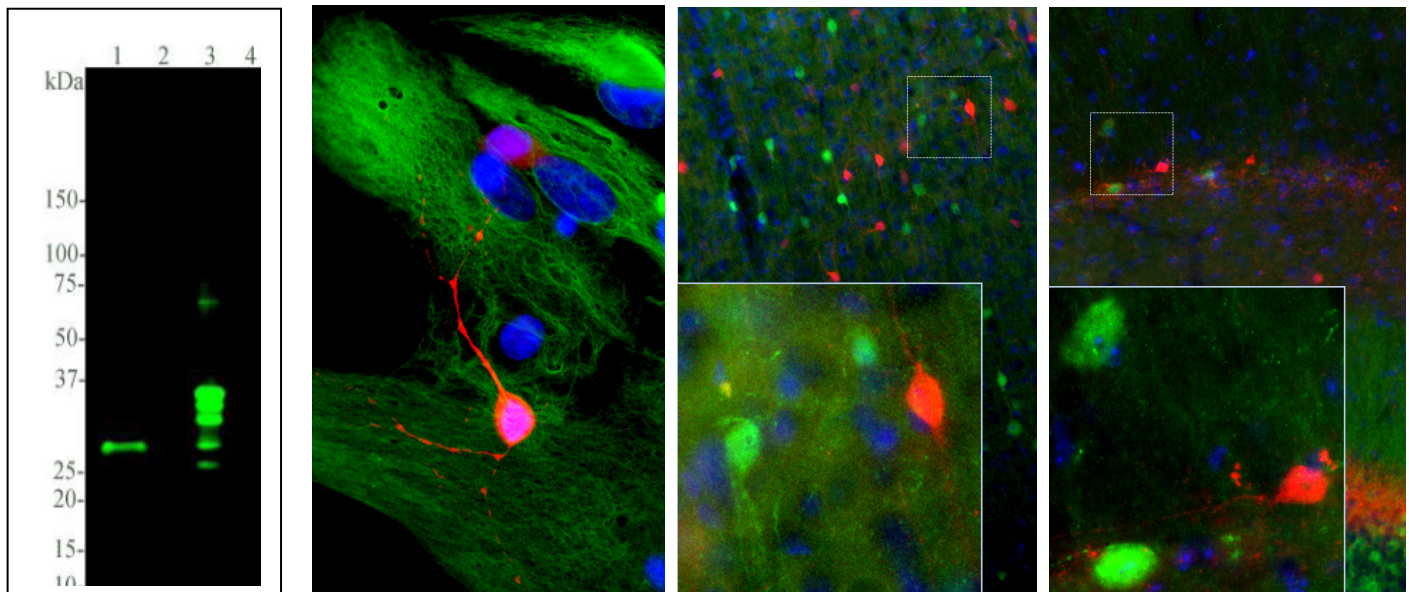


Catalogue# MCA-6A9: Mouse Monoclonal Antibody to Calretinin

The Immunogen: Calretinin, first described in 1987, acquired its name based on homology with calcium binding protein, calbindin D28k and the tissue of first detection (Chick retina) (1). As a member of the large superfamily of cytoplasmic Ca²⁺ binding proteins, Calretinin belongs to the subclass of these containing the "EF hand" Ca²⁺ binding motif originally characterized in parvalbumin (2). Calretinin is expressed in mammalian central nerve system, testis, fallopian tube and pancreas. In the brain it is localized in certain classes of neurons, and antibodies to it are useful for identifying specific neuronal cell types (3). It is particularly concentrated in granular cells and their parallel fibres, but is also found in many GABAergic interneurons in the cortex. These GABAergic interneurons in most cases express only one of three Ca²⁺ binding proteins, namely calretinin, calbindin or parvalbumin. As a result these important inhibitory interneurons can be identified and subclassified based on their content of these three proteins (3). Each type of neuron as defined in this fashion has particular electrophysiological and functional properties. For example, calbindin positive interneurons are not fast-spiking as are parvalbumin expressing interneurons. Human calretinin is also known as 29 kDa calbindin and calbindin-2, for its sequence is related to calbindin. Calretinin contains six EF-hand domains. Four of them bind Ca²⁺ with high affinity in a cooperative manner, one with low affinity and the last one is non-functional, without Ca²⁺-binding ability (4,5). The function of calretinin appears to be primarily buffering the Ca²⁺ level in cells and affect intracellular calcium signals. Calretinin deficiency in mossy cells of dentate gyrus and granule cells results abnormal excitability in the cerebellar neuronal network and impairment of long-term potentiation and motor coordination (6). The HGNC name for this protein is CALB2.



Left: Western blot analysis of MCA-6A9. Blot of rat brain lysates (lane1), recombinant proteins: pavalbumin (lane 2), calretinin (lane 3), calbindin (lane 4) was probed with MCA-6A9 at 1:5,000. In rat brain lysates, this antibody recognizes a clean band at 29 kDa which represents calretinin. Also it reacts with only calretinin, not other calcium-binding proteins. **Middle Left:** Mixed neuron/glia cultures stained with MCA-6A9 at 1:2,000 in red, and our chicken polyclonal antibody to Vimentin (**CPCA-Vim**) in green. Calretinin is prominently expressed in small number of interneurons, while astrocytes and fibroblasts were visualized with the vimentin antibody. **Middle Right:** Adult rat cortical section (45 μ M; fixed by transcardial perfusion with 4% paraformaldehyde) was co-stained with MCA-6A9 (1:1000; red) and our chicken polyclonal antibody to calbindin (**CPCA-Calbindin**; green). In the motor cortex, calretinin is expressed in a small population of interneurons that do not express calbindin. Because each antibody specifically labels a different population of cells exclusively, the cells are either stained with red, or green. **Right:** Adult mouse brain hippocampal section (45 μ M; fixed by transcardial perfusion with 4% paraformaldehyde) was co-stained with MCA-6A9 (1:1000, red) and our **CPCA-Calbindin** (green). In the stratum radiatum of CA1 region, calretinin expresses in a small number of interneurons that do not express calbindin. As a result, our antibodies label different neurons in either red or green. Insets are high-magnification images of the boxed area in each picture. Blue

is a hoechst DNA staining.

Antibody characteristics: Antibody was raised in mouse against recombinant full length human calretinin purified from *E. coli*. This antibody is supplied as an aliquot of purified preparation at 1 mg/mL in 50%glycerol/PBS with 5 mM sodium azide as a preservative. MCA-6A9 is a mouse IgA class antibody. MCA-6A9 recognizes full length human and rodent calretinin specifically both in western blots and in immunocytochemical experiments.

Suggestions for use: The antibody solution can be used at dilutions of 1:1,000-1:2,000 in immunofluorescence experiments. In western blotting using chemiluminescence, it can be used at dilutions of 1:2,000-1:5,000.

Storage Instructions: Shipped on ice. Please store at 4°C for regular uses. For long term storage, please leave frozen at -20°C and avoid freeze/thaw cycles.

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

References:

- 1: Rogers JH: Calretinin: a gene for a novel calcium-binding protein expressed principally in neurons. *J Cell Biol* 105:1343-1353 (1987).
- 2: Kretsinger RH & Nockolds CE. Carp Muscle Calcium-binding Protein: II. Structure determination and general description. *J. Biol. Chem.* 248:3313-3326 (1973).
- 3: Andressen C, Bliimcke I & Celio MR. Calcium-binding proteins: selective markers of nerve cells. *Cell Tissue Res* 271:181-208 (1993).
- 4: Schwaller B, Durussel I, Jermann D, Herrmann B, Cox JA: Comparison of the Ca²⁺-binding properties of human recombinant calretinin-22k and calretinin. *J Biol Chem* 272: 29663-29671 (1997).
- 5: Stevens J, Rogers JH: Chick calretinin: purification, composition, and metal binding activity of native and recombinant forms. *Protein Expr Purif* 9: 171-181, (1997).
- 6: Schiffmann SN, Cheron G, Lohof A, d'Alcantara P, Meyer M, Parmentier M, Schurmans S. Impaired motor coordination and Purkinje cell excitability in mice lacking calretinin. *Proc Natl Acad Sci U S A.* 27: 5257-62 (1999).

[©EnCor Biotechnology Inc.](#) April 5, 2016.