

Ca²⁺ channel P/Q-type, α -1A subunit

Cat.No. 152 103; Polyclonal rabbit antibody, 50 µg specific antibody (lyophilized)

Data Sheet

Reconstitution/Storage	50 µg specific antibody, lyophilized. Affinity purified with the immunogen. Rabbit serum albumin was added for stabilization. For reconstitution add 50 µl H ₂ O to get a 1mg/ml solution in PBS. Then aliquot and store at -20°C until use.
Applications	WB: 1 : 1000 (see remarks) IP: not tested yet ICC: 1 : 500 up to 1 : 5000 IHC: yes (see remarks) IHC-P/FFPE: not tested yet
Immunogen	Recombinant protein corresponding to AA 856 to 888 from mouse Ca ²⁺ channel P/Q-type α -1A (UniProt Id: P97445)
Reactivity	Reacts with: rat (P54282), mouse (P97445). Other species not tested yet.
Specificity	Specific for Ca ²⁺ channel α -1A. (K.O. verified)
Remarks	WB: Due to its large size, this antibody requires special gel-electrophoresis and Western blot protocols for visualization by immunoblotting. Excellent results can be obtained with the 4-12% TRIS-glycine gradient gels of anamed or NuPage TRIS-acetate gels from Invitrogen. This protein tends to aggregate after boiling, making it necessary to run SDS-PAGE with non-boiled samples. IHC: Antibody 2, cat. no. 152 203, is highly recommended for this application.

TO BE USED IN VITRO / FOR RESEARCH ONLY

NOT TOXIC, NOT HAZARDOUS, NOT INFECTIOUS, NOT CONTAGIOUS

Voltage gated calcium channels (VGCCs), also referred to as voltage sensitive calcium channels (VSCCs), are present in most excitable cells. They mediate the influx of Ca²⁺ ions into the cell and trigger the release of neurotransmitters or hormones but are also involved in other calcium dependent processes like metabolism, cell proliferation and cell death.

VGCCs are composed of four subunits (α -1, α -2, β and δ) in a 1:1:1:1 ratio. The α -1A isoform occurs in VGCCs of the **P/Q-type** while isoform α -1B is found in the N-type. Both belong to the high voltage activated group (hva).

Selected References SYSY Antibodies

Active zone protein Bassoon co-localizes with presynaptic calcium channel, modifies channel function, and recovers from aging related loss by exercise.

Nishimune H, Numata T, Chen J, Aoki Y, Wang Y, Starr MP, Mori Y, Stanford JA
PloS one (2012) 7(6): e38029. **IHC; KO verified; tested species: mouse**

α 2 δ expression sets presynaptic calcium channel abundance and release probability.

Hoppa MB, Lana B, Margas W, Dolphin AC, Ryan TA
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Delayed postnatal loss of P/Q-type calcium channels recapitulates the absence epilepsy, dyskinesia, and ataxia phenotypes of genomic Cacna1a mutations.

Mark MD, Maejima T, Kuckelsberg D, Yoo JW, Hyde RA, Shah V, Gutierrez D, Moreno RL, Kruse W, Noebels JL, Herlitze S, et al.
The Journal of neuroscience : the official journal of the Society for Neuroscience (2011) 31(11): 4311-26. **WB**

Alternative Splicing of P/Q-Type Ca²⁺ Channels Shapes Presynaptic Plasticity.

Thalhammer A, Contestabile A, Ermolyuk YS, Ng T, Volynski KE, Soong TW, Goda Y, Cingolani LA
Cell reports (2017) 20(2): 333-343. **ICC; tested species: rat**

Nanoscale Structural Plasticity of the Active Zone Matrix Modulates Presynaptic Function.

Glebov OO, Jackson RE, Winterlood CM, Owen DM, Barker EA, Doherty P, Ewers H, Burrone J
Cell reports (2017) 18(11): 2715-2728. **ICC**

Differential calcium signaling mediated by voltage-gated calcium channels in rat retinal ganglion cells and their unmyelinated axons.

Sargoy A, Sun X, Barnes S, Brecha NC
PloS one (2014) 9(1): e84507. **IHC; tested species: rat**

The active zone protein family ELKS supports Ca²⁺ influx at nerve terminals of inhibitory hippocampal neurons.

Liu C, Bickford LS, Held RG, Nyitrai H, Südhof TC, Kaeser PS
The Journal of neuroscience : the official journal of the Society for Neuroscience (2014) 34(37): 12289-303. **WB**

Postnatal loss of P/Q-type channels confined to rhombic-lip-derived neurons alters synaptic transmission at the parallel fiber to purkinje cell synapse and replicates genomic Cacna1a mutation phenotype of ataxia and seizures in mice.

Maejima T, Wollenweber P, Teusner LU, Noebels JL, Herlitze S, Mark MD
The Journal of neuroscience : the official journal of the Society for Neuroscience (2013) 33(12): 5162-74. **IHC**

Extensive remodeling of the presynaptic cytomatrix upon homeostatic adaptation to network activity silencing.

Lazarevic V, Schöne C, Heine M, Gundelfinger ED, Fejtova A
The Journal of neuroscience : the official journal of the Society for Neuroscience (2011) 31(28): 10189-200. **ICC**

Reciprocal interactions regulate targeting of calcium channel beta subunits and membrane expression of alpha1 subunits in cultured hippocampal neurons.

Obermair GJ, Schlick B, Di Biase V, Subramanyam P, Gebhart M, Baumgartner S, Flucher BE
The Journal of biological chemistry (2010) 285(8): 5776-91. **ICC**

Selected General References

Calcium channel types with distinct presynaptic localization couple differentially to transmitter release in single calyx-type synapses.

Wu LG, Westenbroek RE, Borst JG, Catterall WA, Sakmann B
The Journal of neuroscience : the official journal of the Society for Neuroscience (1999) 19(2): 726-36.

Localization of Ca²⁺ channel subtypes on rat spinal motor neurons, interneurons, and nerve terminals.

Westenbroek RE, Hoskins L, Catterall WA
The Journal of neuroscience : the official journal of the Society for Neuroscience (1998) 18(16): 6319-30.

Biochemical properties and subcellular distribution of the BI and rBA isoforms of alpha 1A subunits of brain calcium channels.

Sakurai T, Westenbroek RE, Rettig J, Hell J, Catterall WA
The Journal of cell biology (1996) 134(2): 511-28.

Immunochemical identification and subcellular distribution of the alpha 1A subunits of brain calcium channels.

Westenbroek RE, Sakurai T, Elliott EM, Hell JW, Starr TV, Snutch TP, Catterall WA
The Journal of neuroscience : the official journal of the Society for Neuroscience (1995) 15(10): 6403-18.

Immunochemical identification and differential phosphorylation of alternatively spliced forms of the alpha 1A subunit of brain calcium channels.

Sakurai T, Hell JW, Woppmann A, Miljanich GP, Catterall WA
The Journal of biological chemistry (1995) 270(36): 21234-42.

Primary structure of a calcium channel that is highly expressed in the rat cerebellum.

Starr TV, Prystay W, Snutch TP
Proceedings of the National Academy of Sciences of the United States of America (1991) 88(13): 5621-5.