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ProductInformation

Anti-Calcium Channel (β_4 Subunit)
Developed in Rabbit, Fractionated Antibody

Product Number **C 5863**

Product Description

Anti-Calcium Channel (β_4 subunit) is developed in rabbit using as immunogen a synthetic peptide derived from the rat calcium channel β_4 subunit conjugated to KLH. The antiserum is purified by ammonium sulfate precipitation.

Anti-Calcium Channel (β_4 subunit) specifically recognizes a calcium channel β_4 subunit (55 kDa) from human, mouse and rat. It is used in immunoblotting applications

Voltage-gated calcium channels (VGCCs) are present in most excitable cells. There are five high-voltage activated calcium channel types (L, N, P, Q, and R) and one low-voltage activated channel type (T). Each of these channels exists as a heteromultimer of α_1, β and α_2/δ subunits with the voltage-activated calcium channel function carried by the α subunits.[1] VGCCs exert spatial and temporal control over cellular calcium concentrations and serve to modulate neurotransmitter release, hormone secretion, muscle contraction, electrical activity, cell metabolism and proliferation, gene expression, and neuronal survival.[2] Evidence suggests that calcium channel α_1 subunit function may be modulated via interactions with other cellular proteins.[3]

The calcium channel β subunit is an intracellular regulatory subunit of voltage-activated calcium channels that has significant impact on expression and electrophysical characteristics of the channel. Calcium channel β subunits regulate voltage-dependent calcium currents through direct interaction with α_1 subunits. The β and α_1 -binding motifs are conserved, and all β subunits can stimulate current amplitude, voltage dependence, and kinetics when coexpressed with various α_1 subunits. Data show that all four β subunit isoforms associate with L-type Ca^{2+} channels in mammalian brain. This β subunit heterogeneity may play an important role for the fine tuning of L-type channel function and modulation in neurons.[4,5] The ataxia and seizures in the lethargic (lh) mouse arise from mutations in the β-subunit gene (Cchb4) on mouse chromosome 2.[6] In humans, mutations in CACNB4 gene is associated with juvenile myoclonic epilepsy, recurrent episodes of vertigo and ataxia.[7]

Reagent

The antibody is supplied at approximately 1 mg/ml in a solution of phosphate buffered saline containing 0.08% sodium azide.

Precautions and Disclaimer

Due to the sodium azide content, a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability

Store at –20 °C. For extended storage, upon initial thawing, freeze in working aliquots. Do not store in frost-free freezers. Avoid repeated freezing and thawing to prevent denaturing the antibody. Working dilution samples should be discarded if not used within 12 hours. The antibody is stable for at least 6 months when stored appropriately.

Product Profile

The amount of the reagent supplied is sufficient for 10 blots.
A recommended working concentration of 5-10 µg/mL is determined by immunoblotting using brain tissue lysate.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration test.

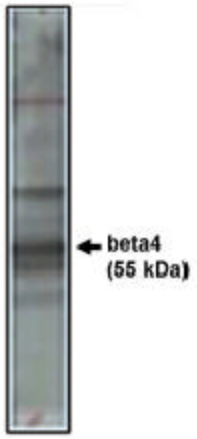

Figure 1 Immunoblot of rat brain lysate incubated with Anti-Calcium Channel (β_4 subunit).

References

1 Varadi, G. et al., Molecular elements of ion permeation and selectivity within calcium channels. Crit. Rev. Biochem. Mol. Biol., **34**,181-204 (1999).

2 Moreno, D.H., Molecular and functional diversity of voltage-gated calcium channels. Ann. N.Y. Acad. Sci., **868**, 102-117 (1999).

3 Waterman, S. A., Voltage-gated calcium channels in autonomic neuroeffector transmission., Prog. Neurobiol., **60**, 181-210 (2000).

4 Lory, P., et al., Towards a unified nomenclature describing voltage-gated calcium channel genes Hum. Genet. **100**, 149-150 (1997).

5 Perez-Reyes, E., et al., Cloning and expression of a cardiac/brain β-subunit of the L-type calcium channel. J. Biol. Chem., **267**, 1792-1797 (1992).

6 Burgess, D. L., et al., Mutation of the Ca^{2+} channel subunit gene Cchb4 is associated with ataxia and seizures in the lethargic (lh) mouse. Cell, **88**, 385-392 (1997).

7 Escayg, A.; et al., Coding and noncoding variation of the human calcium-channel ß4-subunit gene CACNB4 in patients with idiopathic generalized epilepsy and episodic ataxia. Am. J. Hum. Genet. **66**, 1531-1539 (2000).

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