

## ProductInformation

### Anti-Calcium Channel $\beta_1$ Subunit

Developed in Rabbit, Fractionated Antiserum

Product Number **C5988**

#### Product Description

Anti-Calcium Channel  $\beta_1$  subunit is developed in rabbit using a synthetic peptide derived from the rat  $\beta_1$  calcium channel subunit conjugated to KLH as immunogen. The antiserum is purified by ammonium sulfate precipitation.

Anti-Calcium Channel  $\beta_1$  subunit specifically recognizes a splice variant of  $\beta_1$  (66 kDa) from human 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  $\alpha_1$ ,  $\beta$ ,  $\alpha_2/\delta$  and  $\gamma$  subunits with the voltage-activated calcium channel function carried by the  $\alpha$  subunits.<sup>1</sup> 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.<sup>2</sup> Evidence suggests that calcium channel  $\alpha_1$  subunit function may be modulated via interactions with other cellular proteins.<sup>3</sup>

The calcium channel  $\beta$  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  $\beta$  subunits regulate voltage-dependent calcium currents through direct interaction with  $\alpha_1$  subunits. The  $\beta$  and  $\alpha_1$ -binding motifs are conserved, and all  $\beta$  subunits can stimulate current amplitude, voltage dependence, and kinetics when coexpressed with various  $\alpha_1$  subunits. Data show that all four  $\beta$  subunit isoforms associate with L-type  $\text{Ca}^{2+}$  channels in mammalian brain. This  $\beta$  subunit heterogeneity may play an important role for the fine tuning of L-type channel function and modulation in neurons.<sup>4,5</sup>

The  $\beta_1$  subunit is expressed in high levels in the cerebral hemispheres and hippocampus and much lower levels in cerebellum. The primary structure of the brain isoform is highly similar to its isoform in skeletal muscle, and it may have a comparable role as an integral regulatory component of a neuronal calcium channel. The  $\beta_1$  subunit may not only play an important role in the transport/insertion of the  $\alpha_{1S}$  subunit into the membrane, but may also be vital for the targeting of the muscle dihydropyridine receptor complex to the transverse tubule/sarcoplasmic reticulum junction.<sup>6,7</sup>

#### Reagent

Anti-Calcium Channel  $\beta_1$  subunit, at approximately 1 mg/ml, is supplied as a solution in phosphate buffered saline containing 0.08% sodium azide. The amount of the reagent is sufficient for 10 blots.

#### 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  $-20^\circ\text{C}$ . For extended storage, freeze in working aliquots. Avoid repeated freezing and thawing to prevent denaturing of the antibody. Do not store in a frost-free freezer. The antibody is stable for at least 12 months when stored appropriately.

#### Product Profile

A recommended working concentration of 5 to 10  $\mu\text{g/ml}$  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.

## 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 beta subunit of the L-type calcium channel. *J. Biol. Chem.*, **267**, 1792-1797 (1992).
6. Gregg, R., et al., Absence of the beta subunit (cchb1) of the skeletal muscle dihydropyridine receptor alters expression of the alpha-1 subunit and eliminates excitation-contraction coupling. *Proc. Nat. Acad. Sci.*, **93**, 13961-13966 (1996).
7. Cloning and tissue-specific expression of the brain calcium channel beta-subunit. *FEBS Lett.*, **291**: 253-258 (1991).

AH/JK 1/2004

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.