



3050 Spruce Street  
Saint Louis, Missouri 63103 USA  
Telephone 800-325-5832 • (314) 771-5765  
Fax (314) 286-7828  
email: techserv@sial.com  
sigma-aldrich.com

## Product Information

**Anti-Calcium Channel ( $\alpha_{1B}$  Subunit)  
(N-Type of Voltage-Gated  $Ca^{2+}$  Channel)**  
produced in rabbit, affinity isolated antibody

Catalog Number **C1478**

### Product Description

Anti-Calcium Channel ( $\alpha_{1B}$  Subunit) is developed in rabbit using a synthetic peptide corresponding to amino acids 851-867 of the  $\alpha_{1B}$  subunit of rat brain voltage-gated calcium channel (VGCC, CNB1) (with additional N-terminal lysine and tyrosine), conjugated to KLH, as immunogen.<sup>1</sup> The antibody is affinity isolated using peptide-agarose.

Anti-Calcium Channel ( $\alpha_{1B}$  Subunit) recognizes the  $\alpha_{1B}$  subunit by immunoblotting, both the low m.w. (210 kDa) and the high m.w. (240 kDa) form of VGCC in rat and mouse. The antibody may also be used in immunoprecipitation and immunocytochemistry.

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  $\alpha_1$  subunits.<sup>2</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>3,4</sup> Recent evidence suggests that the  $\alpha_1$  subunit function may be modulated via interactions with other cellular proteins.<sup>3,5</sup> Cellular fine control of VGCCs even allows selection of different subtypes of VGCC depending upon cellular conditions. For example, in neurotransmitter release from autonomic neurons, different VGCC subtypes are coupled to transmitter release at low versus high electrical stimulation frequencies, and potassium depolarization versus chemical stimulation.<sup>6</sup> With the ubiquitous expression and functional importance of VGCCs, it is not surprising that alterations in channel function have been implicated in many diseases. This includes cardiovascular disease, migraines, ataxia and epilepsy.<sup>7,8</sup> Mutations in three calcium channel genes have been found in epileptic mice.<sup>9</sup> Calcium dependent

processes are important in synaptic modification and thus alterations in calcium channel function may be important for both modifying synaptic plasticity and also in age-related neurodegenerative diseases.<sup>10</sup> Calcium channel antagonists are used as antiarrhythmics<sup>11</sup> and in the treatment of hypertension<sup>12</sup> and may even be neuroprotective in Parkinson's Disease.<sup>13</sup>

Researchers have learned much about the structure and function of these VGCCs. However, much remains to be determined about their precise cellular localization, *in vivo* physiological roles, roles in disease states and possible routes to modulate their structure/function to ameliorate effects of disease.

### Reagent

Supplied lyophilized from phosphate buffered saline, pH 7.4, containing 1% bovine serum albumin, and 0.05% 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 hazardous and safe handling practices.

### Preparation Instructions

Reconstitute the lyophilized vial with 0.05 ml or 0.2 ml deionized water, depending on package size. Antibody dilutions should be made in buffer containing 1-3% bovine serum albumin.

### Storage/Stability

Prior to reconstitution, store at  $-20^{\circ}C$ . After reconstitution, the stock antibody solution may be stored at  $2-8^{\circ}C$ . for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing, or storage in "frostfree" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

### Product Profile

$\alpha 1$  subunits of voltage-gated  $\text{Ca}^{2+}$  channels are highly sensitive to proteases. All procedures that are going to receive a full-length protein should be performed at  $4^{\circ}\text{C}$  with a protease inhibitor mixture.

(1  $\mu\text{g}/\text{ml}$  pepstatin A, 1  $\mu\text{g}/\text{ml}$  leupeptin, 1  $\mu\text{g}/\text{ml}$  aprotinin, 0.2mM phenylmethane-sulfonyl fluoride, 0.1mg/ml benzamidine, 8  $\mu\text{g}/\text{ml}$  each calpain inhibitors I and II).<sup>14</sup>

Immunoblotting: a recommended working dilution of 1:100 – 1:200 using rat brain membranes.

**Note:** In order to obtain best results and assay sensitivities of different techniques and preparations, we recommend determining optimal working dilutions by titration test.

### References

1. Westenbroek, R .E., et al., *Neuron*, **9**, 1099 (1992).
2. Varadi, G. et al., *Crit. Rev. Biochem. Mol. Biol.*, **34**, 181 (1999).
3. Moreno, D. H., *Ann NY Acad. Sci.*, **868**, 102 (1999).
4. Miljanich, G. P. and Ramachandran J., *Annu. Rev. Pharmacol. Toxicol.*, **35**, 707 (1995).
5. Seagar, M. et al., *Philos. Trans. R.. Soc. Lond. B. Biol. Sci.*, **354**, 289 (1999).
6. Waterman, S. A., *Prog. Neurobiol.*, **60**, 181 (2000).
7. Uneyama, H. et al., *Int. J. Mol. Med.*, **3**, 455 (1999).
8. Ophoff, R. A. et al., *Trends Pharmacol. Sci.*, **19**, 121 (1998).
9. Burgess, D. L. and Noebels, J.L., *Epilepsy Res.*, **36**, 111 (1999).
10. Foster, T. C., *Brain Res. Brain Res. Rev.*, **30**, 236 (1999).
11. Nattel, S. and Singh, B.N., *Am. J. Cardiol.*, **84**, 11R (1999).
12. Singh, V. et al., *Drugs*, **58**, 579 (1999).
13. Rodnitzky, R. L., *Drugs*, **57**, 845 (1999).
14. Westenbroek, R. E., et al., *J. Neurosci.*, **15**, 6403 (1995).

AH,PHC 03/06-1

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.