Product Information

$Ca_v1.2$ Calcium Channel Monoclonal Antibody (Clone S57-46)

Item No. 13702

Contents:	This vial contains 100 µg of protein G-purified IgG in 100 µl PBS, pH 7.4, containing 50% glycerol and 0.09% sodium azide.
Antigen:	Fusion protein from rabbit $Ca_v1.2$ amino acids 1,507-1,733
Isotype:	IgG_{2b}
Host:	Mouse, clone S57-46
Cross Reactivity:	(+) Human, mouse, and rat $Ca_v1.2$
Stability:	≥1 year at -20°C
Applications:	Western blot (WB), immunohistochemistry (IHC), and immunocytochemistry (ICC). The recommended starting dilution for WB is 1-10 µg/ml, IHC/ICC is 0.1-1.0 µg/ml (HRP detection), and IF is 1-10 µg/ml.

Ion channels are integral membrane proteins that help establish and control the small voltage gradient across the plasma membrane of living cells by allowing the flow of ions down their electrochemical gradient.[1] They are present in the membranes that surround all biological cells because their main function is to regulate the flow of ions across this membrane. Whereas some ion channels permit the passage of ions based on charge, others conduct based on a ionic species, such as sodium or potassium. Furthermore, in some ion channels, the passage is governed by a gate which is controlled by chemical or electrical signals, temperature, or mechanical forces.

There are a few main classifications of gated ion channels. There are voltage-gated ion channels, ligand-gated, other gating systems, and finally those that are classified differently, having more exotic characteristics. The first are voltage-gated ion channels which open and close in response to membrane potential. These are then seperated into sodium, calcium, potassium, proton, transient receptor, and cyclic nucleotide-gated channels, each of which is responsible for a unique role. Ligand-gated ion channels are also known as ionotropic receptors, and they open in response to specific ligand molecules binding to the extracellular domain of the receptor protein. The other gated classifications include activation and inactivation by second messengers, inward-rectifier potassium channels, calcium-activated potassium channels, two-pore-domain potassium channels, light-gated channels, mechano-sensitive ion channels, and cyclic nucleotide-gated channels. Finally, the other classifications are based on less normal characteristics such as two-pore channels, and transient receptor potential channels.[2]

Specifically, $Ca_v1.2$ is a cardiac L-type calcium channel and is important for excitation and contraction of the heart.[3] It may be associated with a variant of Long QT syndrome called Timothy's syndrome[4,5] and also with Brugada syndrome. Some references suggest it is related to bipolar disease as well.[5]

References

1. Hille, B. Ion Channels of Excitable Membranes. 3rd Ed., Sinauer Associates Inc., Sunderland, MA (2001).
2. What are ion channels? Retrieved October 22, 2009, from http://www.ionchannels.org/.
3. Splawski, I., Timothy, K.W., Sharpe, L.M., *et al.* $Ca_v1.2$ calcium channel dysfunction causes a multisystem disorder including arrhythmia and autism. *Cell* **119**, 19-31 (2004).
4. Krey, J.F., Dolmetsch, R. The Timothy Syndrome mutation in $Ca_v1.2$ causes dendritic retraction through calcium-independent activation of the rho A pathway. *Biophysical* **96(3)**, 221a-222a (2009).
5. Crotti, L., Celano, G., Dagradi, F., *et al.* Congenital long QT syndrome. *Orphanet Journal of Rare Diseases* **3**, 18-31 (2008).

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