

# Product Information



## Ca<sub>v</sub>1.3 Calcium Channel Monoclonal Antibody (Clone S38-8)

Item No. 13703

<b>Contents:</b>	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.
<b>Antigen:</b>	Fusion protein amino acids 2,025-2,161 (C-terminal) of rat Ca <sub>v</sub> 1.3
<b>Isotype:</b>	IgG <sub>1</sub>
<b>Host:</b>	Mouse, clone S38-8
<b>Cross Reactivity:</b>	(+) Human, mouse, and rat Ca <sub>v</sub> 1.3
<b>Stability:</b>	≥1 year at -20°C
<b>Applications:</b>	Western blot (WB), immunohistochemistry (IHC), immunocytochemistry (ICC), and immunofluorescence (IF). 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.<sup>1</sup> 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 an 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 separated 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.<sup>2</sup>

Specifically, Ca<sub>v</sub>1.3, also known as the calcium channel, voltage-dependent, L type, α1D subunit (CACNA1D), is a human gene. Ca<sub>v</sub>1.3 subunits are primarily expressed in neurons and neuroendocrine cells. Some studies suggest however that Ca<sub>v</sub>1.3 is also found in the atria, and may figure prominently in atrial arrhythmias.<sup>3</sup> Ca<sub>v</sub>1.3 also carries the primary sensory receptors of the mammalian cochlea, and are also expressed in the electromotile outer hair cells.<sup>4</sup>

### 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. Zhang, Z., He, Y., Tuteja, D., *et al.* Functional roles of Cav1.3(α<sub>1D</sub>) calcium channels in atria insights gained from gene-targeted null mutant mice. *Circulation* **112**, 1936-1944 (2005).
4. Johnson, S.L., Marcotti, W. Biophysical properties of Ca<sub>v</sub>1.3 calcium channels in gerbil inner hair cells. *J. Physiol.* **586**(4), 1029-1042 (2008).

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