

# Product Information



## K<sub>v</sub>3.1b Potassium Channel Monoclonal Antibody (Clone S16B-8)

Item No. 13717

<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 437-585 of rat K <sub>v</sub> 3.1b
<b>Isotype:</b>	IgG <sub>1</sub>
<b>Host:</b>	Mouse, clone S16B-8
<b>Cross Reactivity:</b>	(+) Human (weak), mouse, and rat K <sub>v</sub> 3.1b, (110 kDa)
<b>Stability:</b>	≥1 year at -20°C
<b>Applications:</b>	Western blot (WB) and immunohistochemistry (IHC). The recommended starting dilution for WB is 1-10 µg/ml and IHC/ICC is 0.1-1.0 µg/ml (HRP detection), and 1-10 µg/ml (IF).

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 and 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 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>

Potassium voltage-gated channel, Shaw-related subfamily, member 1, also known as KCNC1 or K<sub>v</sub>3.1, is a human gene. The Shaker gene family of *Drosophila* encodes components of voltage-gated potassium channels and is comprised of four subfamilies. Based in sequence similarity, this gene is similar to one of these subfamilies, namely the Shaw subfamily.<sup>3</sup> The protein encoded by this gene belongs to the delayed rectifier class of channel proteins and is an integral membrane protein that mediates the voltage-dependent potassium ion permeability of excitable membranes. K<sub>v</sub>3.1b has been extensively tested in the auditory regions of mammals, and the decline of K<sub>v</sub>3.1b expression appears to correlate with the functional decline in the medial olivocochlear efferent system.<sup>4</sup> Other research shows potential for K<sub>v</sub>3.1b channels to be oxygen sensors.<sup>5</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. Xu, M., Cao, R., Xiao, R., *et al.* The axon-dendrite targeting of K<sub>v</sub>3 (Shaw) channels is determined by a targeting motif that associates with the T1 domain and ankyrin G. *J. Neuroscience* **27(51)**, 14158-14170 (2007).
4. Zettel, M.L., Zhu, X., O'Neill, W. E., Frisina, R. D. Age-related decline in K<sub>v</sub>3.1b expression in the mouse auditory brainstem correlates with functional deficits in the medial olivocochlear efferent system. *JARO* **8**, 280-293 (2007).
5. Osipenko, O. N., Tate, R. J., Gurney, A. M. Potential role for K<sub>v</sub>3.1b channels as oxygen sensors. *Cir. Res.* **86**, 534-540 (2000).

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