

# Product Information



## Na<sub>v</sub>1.7 Sodium Channel Monoclonal Antibody (Clone S68-6)

Item No. 13718

<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 1,751-1,946 of rat Na <sub>v</sub> 1.7
<b>Isotype:</b>	IgG <sub>1</sub>
<b>Host:</b>	Mouse, clone S68-6
<b>Cross Reactivity:</b>	(+)Human, mouse, and rat Na <sub>v</sub> 1.7, (225 kDa)
<b>Stability:</b>	≥1 year at -20°C
<b>Applications:</b>	Western blot (WB), immunoprecipitation (IP), and immunocytochemistry (ICC). 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>

Na<sub>v</sub>1.7 is a voltage-gated sodium channel that plays a critical role in the generation and conduction of action potentials and is thus important for electrical signaling by most excitable cells. Therapeutically, the association of pain insensitivity with the loss of function of a certain sodium channel may have implications. Since Na<sub>v</sub>1.7 is not present in cardiac muscle or neurons in the central nervous system, blockers of Na<sub>v</sub>1.7 will not have direct action on these cells and this can have less side effects than current pain medications. By performing more studies, there is a possibility to develop a new generation of drugs that can reduce the pain intensity in animals.<sup>3-5</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. Dray, A. Neuropathic pain: Emerging treatments. *British Journal of Anaesthesia* **101**(1), 48-58 (2008).
4. Dray, A., Read, S.J. Future targets to control osteoarthritis pain. *Arthritis Research & Therapy* **9**, 212-225 (2007).
5. Samuels, M.E., te Morsche, R.H.M., Lynch, M.E., et al. Compound heterozygosity in sodium channel Na<sub>v</sub>1.7 in a family with hereditary erythralgia. *Mol. Pain* **4**, 21-24 (2008).

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