

Product Information

Anti-Potassium Channel K_v4.2 (Shal1, RK5, Kcnd2)

Produced In Rabbit, Affinity Isolated Antibody

P0233

Product Description

Anti-Potassium Channel K_v4.2 is produced in rabbit using a synthetic peptide corresponding to amino acids 454-469 of rat potassium channel K_v4.2 (with additional N-terminal cysteine) as immunogen.^{1,2} The epitope is identical in human and highly homologous in mouse. The antibody is affinity isolated using peptide-agarose.

Anti-Potassium Channel K_v4.2 recognizes a full-length K_v4.2 protein in rat by immunoblotting. Chloride channels have several functions including:

- Regulating cell volume
- Membrane potential stabilization
- Signal transduction
- Transepithelial transport.

The CLC chloride channel family, which includes voltage-gated chloride channels, represents one of the structural families of chloride channels. Mammals have at least nine different members.³ CLC-2 channels exhibit differential brain distribution and are implicated in regulating and maintaining the chloride gradient in cells that exhibit primarily inhibitory GABA_A responses.⁴ CLC-3 channels are important in cardiac function and their volume sensitivity may be due to PKC/PKA modulated phosphorylation.⁵

Voltage-gated sodium channels (VGSC) are present in most excitable cells. In neuronal tissue, they are responsible for generating and propagating action potentials. Brain VGSC are heteromers of $\alpha\beta_1\beta_2$ subunits. Of these, the α subunit forms the channel pore. Twelve α subunit gene have been identified.⁶ VGSC have been implicated in numerous neurological and cardiac disorders. Further, VGSC are important in mediating many therapeutic drug effects, including the actions of anesthetics, antiarrhythmics and antiepileptics.^{7,8}

Potassium channels contribute to maintaining cell volume, membrane potential, neuronal excitability and the secretion of transmitters, salt, and hormones. Two families of potassium channels have been identified. One family includes the inwardly rectifying potassium channels whereas, the other family includes: voltage sensing (K_V); big conductance, calcium activated (BK_{CA}); and small conductance, calcium activated (SK) potassium channels. In neuronal tissue, BK and SK channels modulate the action potential duration, the speed of repolarization and the after hyperpolarization.^{9,10} These channels are implicated both in therapeutic drug effects and also in disease.⁹⁻¹¹ K_V channels have been implicated in activity dependent, plastic changes in neuronal tissue.^{12,13} HERG (human ether-a-go-go-related gene) is similar to the delayed rectifier channel and is important in cardiac function and may also play a role in certain cardiac arrhythmias.¹⁵

Many subunits that form the ion channels have been cloned and expressed. With the combination of molecular biology and electrophysiology, although much has been learned about the structure and function of the ion channels, much remains to be determined about the *in vivo* physiological roles of the ion channel subtypes and in their roles in mediating therapeutic drug effects.

Monovalent ion channels are being associated with a growing number of diseases.^{8,15} Thus, further research is required to determine the physiological function and role of Cl, K and Na channel subtypes as well as the ion channels themselves in the hopes of discovering new treatments for these pathologies.

Reagent

Supplied as a Lyophilized powder from phosphate buffered saline, pH 7.4, containing 1% BSA, and 0.05% sodium azide.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the safety data sheet for information regarding hazards and safe handling practices. Please refer to the Certificate of Analysis for the lot-specific concentration after reconstitution.

Preparation Instructions

Reconstitute the lyophilized vial with 0.05 mL or 0.2 mL deionized water. Antibody dilutions should be made in buffer containing 1-3% bovine serum albumin.

Storage/Stability

Prior to reconstitution, store at -20°C . After reconstitution, the stock antibody solution may be stored at $2-8^{\circ}\text{C}$. for up to one week. For extended storage, freeze in working aliquots. Repeated freezing and thawing, or storage in "frost-free" 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

Western Blotting

The recommended working dilution is 1:200.

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. Baldwin, T.J., et al., *Neuron*, 7, 471 (1991).
2. Roberds, S.L., and Tamkun, M.M., *Proc. Natl. Acad. Sci. USA*, 88, 1798 (1991).
3. Jentsch, T.J. et al., *J. Physiol.*, 482, 19S, (1995).
4. Staley, K. et al., *Neuron*, 17, 543, (1996).
5. Nagasaki M. et al., *J. Physiol.*, 523, 705 (2000).
6. Jeong, S.Y. et al., *Biochem. Biophys. Res. Commun.*, 267, 262 (2000).
7. Catterall, W.A., *Adv. Neurol.*, 79, 441 (1999).
8. Vincent, G.M. et al., *Cardiol. Rev.*, 7, 44 (1999).
9. Scholtz, A. et al., *J. Physiol.*, 513, 55 (1998).
10. Dreixler, J.C. et al., *Anesth. Analg.*, 90, 727 (2000).
11. Bond, C.T. et al., *Ann. N.Y. Acad. Sci.*, 868, 370 (1999).
12. Grosse, G. et al., *J. Neurosci.*, 20, 1869 (2000).
13. McFarlane, S., and Pollock, N.S., *J. Neurosci.*, 20, 1020 (2000).
14. Teschemacher, A.G. et al., *Br. J. Pharmacol.*, 128, 479 (1999).
15. Lehmann-Horn, F. and Jurkat-Rott, K., *Physiol. Rev.*, 79, 1317 (1999).

Notice

We provide information and advice to our customers on application technologies and regulatory matters to the best of our knowledge and ability, but without obligation or liability. Existing laws and regulations are to be observed in all cases by our customers. This also applies in respect to any rights of third parties. Our information and advice do not relieve our customers of their own responsibility for checking the suitability of our products for the envisaged purpose.

The information in this document is subject to change without notice and should not be construed as a commitment by the manufacturing or selling entity, or an affiliate. We assume no responsibility for any errors that may appear in this document.

Technical Assistance

Visit the tech service page at SigmaAldrich.com/techservice.

Terms and Conditions of Sale

Warranty, use restrictions, and other conditions of sale may be found at SigmaAldrich.com/terms.

Contact Information

For the location of the office nearest you, go to SigmaAldrich.com/offices.

The life science business of Merck KGaA, Darmstadt, Germany
operates as MilliporeSigma in the U.S. and Canada.

MilliporeSigma, and Sigma-Aldrich are trademarks of Merck KGaA, Darmstadt, Germany or its affiliates. All other trademarks are the property of their respective owners. Detailed information on trademarks is available via publicly accessible resources.

© 2012–2025 Merck KGaA, Darmstadt, Germany and/or its affiliates. All Rights Reserved.

23195330pis Rev04/25

**Millipore
Sigma**