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Product Information

Anti-Muscarinic Acetylcholine Receptor (M_2)
produced in rabbit, affinity isolated antibody

Catalog Number **M9558**

Product Description

Anti-Muscarinic Acetylcholine Receptor (M_2) is produced in rabbit using as immunogen a highly purified GST fusion protein of a part of the i3 intracellular loop of human M_2 muscarinic acetylcholine receptor (mAChR) corresponding to amino acid residues 227-356[1,2]. The antibody is affinity isolated using GST fusion protein-agarose.

Anti-Muscarinic Acetylcholine Receptor (M_2) recognizes human, mouse and rat M_2 muscarinic acetylcholine receptor by immunoblotting. The antibody may also be used for immunohistochemistry,[3] and immunoprecipitation.[3,4]

Acetylcholine actions are mediated by two classes of receptor, nicotinic or muscarinic receptors. Five subtypes (M_1-M_5) of muscarinic receptors have been identified.[5] Muscarinic receptors are members of the G protein-coupled receptor family. M_1, M_3 and M_5 activate phospholipases A2, C or D, or tyrosine kinase and M_2 and M_4 attenuate adenylate cyclase or augment phospholipase A2.[5] Muscarinic receptors are expressed throughout the CNS with M_2 receptors enriched in the cerebellum, pons/medulla and thalamus/hypothalamus whereas M_1 receptors are enriched in hippocampus, striatum and olfactory tubule.[6,7] Peripherally, M_2 receptors represent over 90% of the muscarinic receptors in heart[6] and both m1 and m2 are expressed in airways.[8]

Muscarinic receptors have various presynaptic and postsynaptic effects that are important in both information processing and plastic changes in CNS function. One major role of M_2 receptors is as autoreceptors and heteroreceptors to control neurotransmitter release.[9] Muscarinic receptors may be important in changes associated with learning and memory. Evidence implicates M_1 receptors in mossy fiber LTP[10] and M_2 receptors mediate muscarinic LTP.[11] Another functional area where both M_1 and M_2 are implicated, but probably play different roles, is in cholinergic modulation of visual input.[12]

Alterations in muscarinic receptors or function have been implicated in some neurological disorders including Down's Syndrome, Alzheimer's and Parkinson's disease.[5] M_1 receptors may contribute to the development of ischemic brain damage.[13] Interestingly, alterations in both M_1 and M_2 receptors may be implicated in different forms of cortical dementia with M_1 implicated in DLBD (diffuse Lewy body disease) and M_2 in Alzheimer's.[114]

Peripherally, alterations in M_2 function may be implicated in viral lung infections[15] and asthma.[16] The presence of anti-M_2-muscarinic receptor autoantibodies may lead to alterations in M_2 function and thus to heart dysfunction.[17,18]

Although much has been learned about the structure and function of these muscarinic receptors, much remains to be determined about their precise cellular localization and *in vivo* physiological roles, their possible roles in disease states and their roles in mediating therapeutic drug effects.

Reagent

Supplied as a lyophilized powder from phosphate buffered saline, pH 7.4, containing 1% bovine serum albumin, 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 Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions

Reconstitute the lyophilized vial with 0.05 or 0.2 mL deionized water, depending on the package size purchased. 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 °C. for up to two weeks. 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
Immunoblotting: the recommended working dilution is 1:200 (1.5 µg/mL) using rat brain membranes, Anti-Rabbit IgG-Peroxidase conjugate and detection by ECL.

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. Bonner, T.I., et al., *Science*, **237,** 527 (1987).
2. Peralta, E.G., et al., *EMBO J*., **6**, 3923 (1987).
3. Levey, A.I., et al., *J. Neurosci*., **11**, 3218 (1991).
4. Levey, A.I., et al., *FEBS Lett*., **275**, 65 (1990).
5. Felder, C.C., *FASEB J*., **9**, 619 (1995).
6. Li, M. et al., Mol. Pharm., **40**, 28 (1991).
7. Wall, S.J. et al., *Mol. Pharm*., **39**, 643 (1991).
8. Barnes, P.J., *Agents Actions Suppl*., **43**, 243 (1993).
9. Levey, A.I. et al., *J. Neurosci*., **15**, 4077 (1995).
10. Kaneko, S. et al., *Behav. Brain Res*., **83**, 45 (1997).
11. Segal, M. and Auerbach, J.M., *Life Sci*., **60**, 1085 (1997).
12. Tigges, M. et al., *J. Comp. Neurol*., **388**, 130 (1997).
13. Jiang, Z.W. et al., *Brain Res*., **852**, 37 (2000).
14. Shiozaki, K. et al., *J. Neurol. Neurosurg. Psychiatry*, **67**, 209 (1999).
15. Jacoby, D.B. and Fryer, A.D., *Clin. Exp. Allergy*, **29**, 59 (1999).
16. Fryer, A.D. et al., *Life Sci*., **64**, 449 (1999).
17. Retondaro, F.C. et al., *FASEB J*., **13**, 2015 (1999).
18. Matsui, S. et al., *J. Card. Fail*., **5**, 246 (1999).

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