ProductInformation

MONOCLONAL ANTI-GLUTAMATE RECEPTOR NMDAR1 (NR1), Clone 5-1-G10
Purified Rat Immunoglobulin

Product Number **M-207**

Product Description

Monoclonal Anti-Glutamate Receptor NMDAR1 (NR1) (rat isotype IgG2a kappa) is derived from the 5-1-G10 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a rat immunized with a GST fusion protein of NR1 isoform containing the exon 5 splice variant of the human NR1.[1,2]

Monoclonal Anti-Glutamate Receptor NMDAR1 (NR1) reacts specifically with the N-methyl-D-aspartate R1 (NR1) subunit of the NMDA glutamate receptor in transfected cells, as well as rodent, monkey and human brain tissues by immunoblotting and immunohistochemistry.

Glutamate receptors are the major excitatory neurotransmitter receptors in the mammalian central nervous system (CNS) and play a central role in brain function and in neurodegenerative disease. Glutamate receptors are divided into two major categories: ionotropic receptors, which function as ligand-gated ion channels, and the metabotropic receptors (mGluRs) which are coupled via G-proteins to second messenger systems. The ionotropic receptors are subdivided into three pharmacologically distinct classes: the AMPA receptors, kainate receptors and the N-methyl-D-aspartate (NMDA) receptors.[3,4] The NMDA receptors are implicated in synaptic plasticity, neuronal development, in learning and memory, and in the pathogenesis of acute and chronic neurodegenerative disorders. Excessive stimulation of NMDA receptors, also known as glutamate excitotoxicity, can lead to neuronal cell death and may be a common final pathway in several pathological conditons, including stroke, head injury, epilepsy and in neurodegenerative diseases such as Huntington's disease and Alzheimer's disease.[5-7]

Molecular cloning has revealed a large family of genes encoding highly related NMDA receptor subunits.[8-12] These include the NMDAR1 (also termed NR1 or ζ1), and the NMDAR2A-NMDAR2D subunits (also termed NR2A-NR2D or ε1-ε4 respectively). Alternative splicing can generate at least eight different NR1 isoforms with distinct functional properties.[13] Several lines of evidence indicate that natively expressed NMDA receptors comprise the NR1/ζ1 subunit and at least one member of the NR2 class, forming hetero-pentamer complexes, similar to other receptor ion channels. Gene targeting indicates that the subunits ζ1 and ε2 appear to be essential for NMDA receptor function and survival in newborn mice.[14] The NMDA receptors are highly permeable to Ca^{2+}, Na^{+} and K^{+}, and contain modulatory sites for Mg^{2+}, Zn^{2+}, glycine, protons and polyamines.[4]

Tyrosine phosphorylation regulates the function of NMDA receptors that are necessary for induction of long term potentiation (LTP), a mechanism proposed to underlie learning and memory.[15] Tyrosine phosphorylation of NMDA receptors may be principally mediated by the tyrosine kinase Src. The NMDA receptors interact through their C-terminus with post-synaptic cytoskeletal proteins. These include α-actinin, and PSD-95 proteins that may be involved in the clustering of NMDA receptors at post-synaptic sites, attachment to cytoskeleton, and interaction with downstream signaling proteins, such as nNOS.[16]

Antibodies reacting specifically with NMDA receptor subunits may be used to study their expression and function in a variety of cell types and tissues and to correlate their expression pattern with physiological functions or pathological conditions.

Reagents

Monoclonal Anti-Glutamate Receptor NMDAR1 (NR1) is supplied in 0.1 M Tris-HCl, pH 7.4, containing 54% glycerol.

Protein concentration is approximately 0.1 mg/ml.

Storage/Stability

For continuous use, store at 0 °C to –20 °C. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

Product Profile

Suggested working dilution is 1:100 by immunohistochemistry.

Note: In order to obtain best results and assay sensitivity in different techniques and preparations we recommend determining optimal working dilutions by titration test.

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