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ProductInformation

Anti-phospho-AMPA Receptor, GluR1 Subunit (pSer^{845})
produced in rabbit, affinity isolated antibody

Catalog Number **A4477**

Product Description

Anti-phospho-AMPA Receptor, GluR1 Subunit (pSer^{845}) is produced in rabbit using as immunogen a synthetic phosphorylated peptide corresponding to a region near serine 845 of rat glutamate receptor (100 kDa) subunit GluR1. The GluR1 sequence is conserved among the species. This sequence has partial homology to VGLUT2. The rabbit serum is affinity purified using epitope-specific affinity chromatography. The antibody is preadsorbed to remove any reactivity toward a non-phosphorylated GluR1 peptide or a serine phosphorylated peptide, irrespective of the sequence.

Anti-phospho-AMPA Receptor, GluR1 Subunit (pSer^{845}) recognizes human and rat AMPA Receptor, GluR1 subunit (pSer^{845}). It is used in immunoblotting.

Glutamic acid is the major excitatory neurotransmitter in the mammalian central nervous system (CNS). Malfunctioning of the glutamatergic system may be involved in many brain disorders, including epilepsy, anxiety, depression and schizophrenia. Excessive neuronal excitation mediated by glutamic acid is thought to be a factor in the neuronal death after ischemia, and in neurodegenarative diseases, including Alzheimer's. Glutamate receptors are cell-surface proteins that bind glutamic acid and are activated in a variety of normal neurophysiologic processes. The glutamate receptors are divided into two types: ionotropic glutamate receptors, which directly control ion channels, and metabotropic glutamate receptors, which are coupled to G proteins and act through second messenger systems.

AMPA receptors are cell surface proteins that bind glutamate and directly gate ion channels in cell membranes and exhibit affinity for the agonist AMPA (α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid). They are the most common mediators of excitatory synaptic transmission in the central nervous system. Several subtypes have been cloned.[1]

AMPA receptor phosphorylation is critical for synaptic plasticity, and identical stimulation conditions recruit different signal transduction pathways depending on synaptic history.[2] The GluR1 subunit is phosphorylated on multiple sites that are all located on the C-terminus of the protein. Cyclic AMP-dependent protein kinase specifically phosphorylates Ser^{845} of GluR1 in transfected HEK cells and in neurons in culture. Phosphorylation of this residue results in a 40% potentiation of the peak current through GluR1 homomeric channels. In addition, protein kinase C specifically phosphorylates Ser^{831} of GluR1. In the proposed transmembrane topology models of glutamate receptors, the C-terminus is located in the intracellular region. The modulation of GluR1 by PKA phosphorylation of Ser^{845} suggests that phosphorylation of this residue may underlie the PKA-induced potentiation of AMPA receptors in neurons.[3] Studies in the animal model of depression show that the anti-depressant, fluoxetine, increases phosphorylation of the AMPA receptor subunit GluR1 at Ser^{831} and Ser^{845}.[4]

Reagent

Supplied as a solution in 10 mM HEPES buffer, pH 7.5, containing 150 mM NaCl, 100 µg/ml BSA and 50% glycerol.

Storage/Stability

Store at –20 °C. Due to high viscosity of glycerol, the stock solution needs to be mixed well prior to aliquoting. The antibody is stable for at least 6 months when stored appropriately. 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 dilutions should be discarded if not used within 12 hours.

Product Profile
Immunoblotting: a minimum working dilution of 1:1,000 is determined by using rat brain extracts.

Note: In order to obtain the best results using different techniques and preparations, we recommend determining the optimal working dilutions by titration.

References

1. Gregor, P., et al., Chromosomal localization of glutamate receptor genes: relationship to familial amyotrophic lateral sclerosis and other neurological disorders of mice and humans. *Proc. Nat. Acad. Sci. USA*, **90**, 3053-3057 (1993).
2. Lee, H. K., et al**.,** Regulation of distinct AMPA receptor phosphorylation sites during bidirectional synaptic plasticity. *Nature*, **405**, 955-959 (2000).
3. Roche, K. W., et al., Characterization of multiple phosphorylation sites on the AMPA receptor GluR1 subunit. *Neuron*, **6**, 1179-88 (1996).
4. Svenningsson, P., et al., Involvement of striatal and extrastriatal DARPP-32 in biochemical and behavioral effects of fluoxetine (Prozac). *Proc. Natl. Acad. Sci. USA*, **99**, 3182-3187 (2002).

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