

#75574 Store at -20C

Phospho-AMPA Receptor 1 (GluA1) (Ser831) (A5O2P) Rabbit mAb


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|--------------------------------|---------------------------|-----------------------------------|-------------------------|--------------------------------------|-------------------------------|--------------------------------|
| Applications: WB, IP | Reactivity: H M | Sensitivity: Endogenous | MW (kDa): 100 | Source/Isotype: Rabbit IgG | UniProt ID: #P42261 | Entrez-Gene Id: 2890 |
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Product Usage Information

Application

Western Blotting
Immunoprecipitation

Dilution

1:1000
1:50

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at -20°C. Do not aliquot the antibody.

Specificity / Sensitivity

Phospho-AMPA Receptor 1 (GluA1) (Ser831) (A5O2P) Rabbit mAb recognizes endogenous levels of AMPA Receptor 1 (GluA1) protein only when phosphorylated Ser831. While the literature refers to this residue as Ser831, it is Ser849 in the UniProt sequence P42261.

Species predicted to react based on 100% sequence homology:

Rat

Source / Purification

Monoclonal antibody is produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Ser831 of human AMPA Receptor 1 (GluA1) protein.

Background

AMPA- (α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid), kainate-, and NMDA- (N-methyl-D-aspartate) receptors are the three main families of ionotropic glutamate-gated ion channels. AMPA receptors (AMPARs) are comprised of four subunits (GluR 1-4), which assemble as homo- or hetero-tetramers to mediate the majority of fast excitatory transmissions in the central nervous system. AMPARs are implicated in synapse formation, stabilization, and plasticity (1). In contrast to GluR 2-containing AMPARs, AMPARs that lack GluR 2 are permeable to calcium (2). Post-transcriptional modifications (alternative splicing, nuclear RNA editing) and post-translational modifications (glycosylation, phosphorylation) result in a very large number of permutations, fine-tuning the kinetic properties of AMPARs. Research studies have implicated activity changes in AMPARs in a variety of diseases including Alzheimer's, amyotrophic lateral sclerosis (ALS), stroke, and epilepsy (1). AMPA-type glutamate receptor activity is regulated by phosphorylation, which plays an important role in synaptic plasticity. CaMKII and PKC phosphorylate GluR 1 at Ser831, while PKA phosphorylates GluR 1 at Ser845 (3-5). Furthermore, Ser845 phosphorylation is increased by activation of D1-type dopamine receptors and by inhibition of protein phosphatase 1/protein phosphatase 2A (5,6). Phosphorylation at either Ser831 or Ser845 potentiates AMPA receptor ion channel function: long-term potentiation (LTP) correlates with increased phosphorylation, while long-term depression (LTD) correlates with a dephosphorylation of GluR 1 (6). Phosphomutant mice (Ser831Ala and Ser845Ala) show deficits in LTD and LTP. Either Ser831 or Ser845 alone may support LTP, while only Ser845 is critical for LTD. Furthermore, these mice have memory deficiencies in spatial learning tasks (7,8). GluR 1 receptors are phosphorylated at either Ser831 or Ser845 at ~15-20% under basal conditions and ~50% under stimulated conditions (behavioral or pharmacological) (9).

Background References

1. Palmer, C.L. et al. (2005) *Pharmacol Rev* 57, 253-77.
2. Cull-Candy, S. et al. (2006) *Curr Opin Neurobiol* 16, 288-97.
3. Mammen, A.L. et al. (1997) *J Biol Chem* 272, 32528-33.
4. Barria, A. et al. (1997) *J Biol Chem* 272, 32727-30.
5. Roche, K.W. et al. (1996) *Neuron* 16, 1179-88.
6. Lee, H.K. et al. (2000) *Nature* 405, 955-9.
7. Lee, H.K. et al. (2003) *Cell* 112, 631-43.
8. He, K. et al. (2009) *Proc Natl Acad Sci U S A* 106, 20033-8.
9. Diering, G.H. et al. (2016) *Proc Natl Acad Sci U S A* 113, E4920-7.

Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

Applications Key

WB: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: human **M:** mouse **R:** rat **Hm:** hamster **Mk:** monkey **Vir:** virus **Mi:** mink **C:** chicken **Dm:** D. melanogaster **X:** Xenopus **Z:** zebrafish **B:** bovine **Dg:** dog **Pg:** pig **Sc:** S. cerevisiae **Ce:** C. elegans **Hr:** horse **GP:** Guinea Pig **Rab:** rabbit **All:** all species expected

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