Revision 3

Store at -20C

#8084

Phospho-AMPA Receptor 1 (GluA1) (Ser845) (D10G5) Rabbit mAb

Cell Signaling TECHNOLOGY®

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

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	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) (Ser845) (D10G5) Rabbit mAb recognizes endogenous levels of AMPA Receptor 1 (GluA1) protein only when phosphorylated at Ser845. While the literature refers to this residue as Ser845, it is Ser863 in the UniProt sequence P42261.

Source / Purification

Monoclonal antibody is produced by immunizing animals with a synthetic phosphopeptide corresponding to residues surrounding Ser845 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).
The activation of PKA regulates the activity of AMPA-type glutamate receptors by phosphorylation of the subunit GluR 1 at Ser845. Furthermore, Ser845 phosphorylation is increased by activation of D1-type dopamine receptors and by inhibition of protein phosphatase 1/protein phosphatase 2A (3,4). 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 (5). 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 (6,7). Assembly of the β2-adrenergic receptor, trimeric Gs protein, adenyl cyclase, PKA, GluR 1, stargazin, and PSD95 signaling complex for localized cAMP signaling is dependent on phosphorylation of GluR 1 at Ser845 (8).

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. Roche, K.W. et al. (1996) *Neuron* 16, 1179-88.
4. Snyder, G.L. et al. (2000) *J Neurosci* 20, 4480-8.
5. Lee, H.K. et al. (2000) *Nature* 405, 955-9.
6. Lee, H.K. et al. (2003) *Cell* 112, 631-43.
7. He, K. et al. (2009) *Proc Natl Acad Sci USA* 106, 20033-8.
8. Joiner, M.L. et al. (2010) *EMBO J* 29, 482-95.

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

W: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: Human **M:** Mouse **R:** Rat

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