Anti-Phospho-Ser^{831} GluR1 Antibody

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Catalog #: p1160-831 **Size:** 150 µl

Cite this Antibody: PhosphoSolutions Cat# p1160-831, RRID:AB_2492127

Host	Applications	Species Tested	Species Reactivity*	Molecular Weight
Rabbit	WB 1:1000	H, M, R	C, Ch	~100 kDa

Product Description: Affinity purified rabbit polyclonal antibody.

Biological Significance: The ion channels activated by glutamate are typically divided into two classes. Those that are sensitive to N-methyl-D-aspartate (NMDA) are designated NMDA receptors (NMDAR) while those activated by α-amino-3-hydroxy-5-methyl-4-isoxalone propionic acid (AMPA) are known as AMPA receptors (AMPAR). The AMPAR are comprised of four distinct glutamate receptor subunits designated (GluR1-4) and they play key roles in virtually all excitatory neurotransmission in the brain (Keinänen et al., 1990; Hollmann and Heinemann, 1994). The GluR1 subunit is widely expressed throughout the nervous system. GluR1 is potentiated by phosphorylation at Ser^{831} which has been shown to be mediated by either PKC or CaM kinase II (McGlade-McCulloh et al., 1993; Mammen et al., 1999; Roche et al., 1996). In addition, phosphorylation of this site has been linked to synaptic plasticity as well as learning and memory (Soderling and Derkach, 2000).

Antigen: Phosphopeptide corresponding to amino acid residues surrounding the phospho-Ser^{831} of rat GluR1.

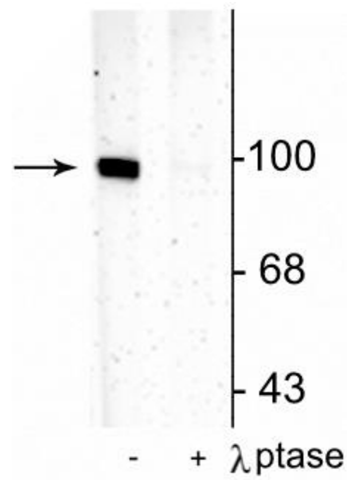
Antibody Specificity: Specific for endogenous levels of the ~100 kDa GluR1 protein phosphorylated at Ser^{831}. Immunolabeling is completely eliminated by treatment with λ-Ptase.

Purification Method: Prepared from pooled rabbit serum by affinity purification via sequential chromatography on phospho and non-phosphopeptide affinity columns.

Quality Control Tests: Western blots performed on each lot.

Packaging: 150 µl in 10 mM HEPES (pH 7.5), 150 mM NaCl, 100 µg BSA per ml and 50% glycerol.

Storage and Stability: Shipped on blue ice. Storage at -20°C is recommended, as aliquots may be taken without freeze/thawing due to presence of 50% glycerol. Stable for at least 1 year at -20°C.



Western blot of rat hippocampal lysate showing specific immunolabeling of the ~100 kDa GluR1 protein phosphorylated at Ser^{831} in the first lane (-). Phosphospecificity is shown in the second lane (+) where immunolabeling is completely eliminated by blot treatment with *lambda* phosphatase (λ-Ptase, 1200 units for 30 min).

Application Key: **WB** = Western Blot **IF** = Immunofluorescence **IHC** = Immunohistochemistry **IP** = Immunoprecipitation
Species Reactivity Key: **All**-All Species **A**-Avian **Amp**-Amphibian **Ar**-*Arabidopsis* **B**-Bovine **C**-Canine **Ch**-Chicken **D**-*Drosophila* **GP**-Guinea Pig **H**-Human **Ha**-Hamster **M**-Mouse **NHP**- Non-human primate **P**-Pig **R**-Rat **S**-Sheep **X**-*Xenopus* **Z**-Zebrafish
*Species assumed based on 100% homology with sequence used as antigen **For Research Use Only**

Product Specific References:

Mao, L.M., He, N., Jin, D.Z. and Wang, J.Q., 2018. Regulation of Phosphorylation of AMPA Glutamate Receptors by Muscarinic M4 Receptors in the Striatum In vivo. *Neuroscience*, *375*, pp.84-93.

Xue, B., Mao, L.M., Jin, D.Z. and Wang, J.Q., 2017. Pharmacological modulation of AMPA receptor phosphorylation by dopamine and muscarinic receptor agents in the rat medial prefrontal cortex. *European journal of pharmacology*. 2017 Dec 11;820:45-52.

Lameth, J., Gervais, A., Colin, C., Lévêque, P., Jay, T.M., Edeline, J.M. and Mallat, M., 2017. Acute Neuroinflammation Promotes Cell Responses to 1800 MHz GSM Electromagnetic Fields in the Rat Cerebral Cortex. *Neurotoxicity Research*, pp.1-16.

Xue, B., Chen, E. C., He, N., Jin, D. Z., Mao, L. M., & Wang, J. Q. (2016). Integrated regulation of AMPA glutamate receptor phosphorylation in the striatum by dopamine and acetylcholine. *Neuropharmacology*.

O'Leary, H., Bernard, P. B., Castano, A. M., & Benke, T. A. (2016). Enhanced long term potentiation and decreased AMPA receptor desensitization in the acute period following a single kainate induced early life seizure. *Neurobiology of disease*, 87, 134-144.

Bean, L.A., Kumar, A., Rani, A., Guidi, M., Rosario, A.M., Cruz, P.E., Golde, T.E. and Foster, T.C., 2015. Re-opening the critical window for estrogen therapy. *Journal of Neuroscience*, 35(49), pp.16077-16093.

Pasek, J. G., Wang, X., & Colbran, R. J. (2015). Differential CaMKII regulation by voltage-gated calcium channels in the striatum. *Molecular and Cellular Neuroscience*, 68, 234-243.

Mao, L. M., Xue, B., Jin, D. Z., & Wang, J. Q. (2015). Dynamic increases in AMPA receptor phosphorylation in the rat hippocampus in response to amphetamine. *Journal of neurochemistry*. Jun;133(6):795-805.

Mao, L. M., Hastings, J. M., Fibuch, E. E., & Wang, J. Q. (2014). Propofol selectively alters GluA1 AMPA receptor phosphorylation in the hippocampus but not prefrontal cortex in young and aged mice. *European journal of pharmacology*, 738, 237-244.

Bernard, P.B., Castano, A.M., Bayer, K.U. and Benke, T.A., 2014. Necessary, but not sufficient: insights into the mechanisms of mGluR mediated long-term depression from a rat model of early life seizures. *Neuropharmacology*, 84, pp.1-12.

Xue, B., Edwards, M. C., Mao, L. M., Guo, M. L., Jin, D. Z., Fibuch, E. E., & Wang, J. Q. (2014). Rapid and sustained GluA1 S845 phosphorylation in synaptic and extrasynaptic locations in the rat forebrain following amphetamine administration. *Neurochemistry international*, 64, 48-54.

Barcomb, K., Coultrap, S. J., & Bayer, K. U. (2013). Enzymatic activity of CaMKII is not required for its interaction with the glutamate receptor subunit GluN2B. *Molecular pharmacology*, *84*(6), 834-843.

Jalan-Sakrikar, N., Bartlett, R.K., Baucum, A.J. and Colbran, R.J., 2012. Substrate-selective and calcium-independent activation of CaMKII by α-actinin. *Journal of Biological Chemistry*, 287(19), pp.15275-15283.

Yuxia Jiao, Nidhi Jalan-Sakrikar, A. J. Robison, Anthony J. Baucum, II, Martha A. Bass, and Roger J. Colbran (2011) Characterization of a Central Ca^{2+}/Calmodulin-dependent Protein Kinase IIα/β Binding Domain in Densin That Selectively Modulates Glutamate Receptor Subunit Phosphorylation. *J. Biol. Chem.* 286: 24806 - 24818.

Robert M. Sears, Rong-Jian Liu, Nandakumar S. Narayanan, Ruth Sharf, Mark F. Yeckel, Mark Laubach, George K. Aghajanian, and Ralph J. DiLeone (2010) Regulation of Nucleus Accumbens Activity by the Hypothalamic Neuropeptide Melanin-Concentrating Hormone *J. Neurosci*., 30: 8263 - 8273.

Steven J. Coultrap, Isabelle Buard, Jaqueline R. Kulbe, Mark L. Dell'Acqua, and K. Ulrich Bayer (2010) CaMKII Autonomy Is Substrate-dependent and Further Stimulated by Ca^{2+}/Calmodulin. *J. Biol. Chem*., 285: 17930 – 1793.

Kurtis D. Davies, Susan M. Goebel-Goody, Steven J. Coultrap, and Michael D. Browning (2008) Long Term Synaptic Depression That Is Associated with GluR1 Dephosphorylation but Not α-Amino-3-hydroxy-5-methyl-4-isoxazolepropionic Acid (AMPA) Receptor Internalization *J. Biol. Chem*., 283: 33138 - 33146.

Sergio Leal-Ortiz, Clarissa L. Waites, Ryan Terry-Lorenzo, Pedro Zamorano, Eckart D. Gundelfinger, and Craig C. Garner (2008) Piccolo modulation of Synapsin1a dynamics regulates synaptic vesicle exocytosis**.** *J. Cell Biol*., 181: 831 - 846.

Hu, H., Real, E., Takamiya, K., Kang, M.G., Ledoux, J., Huganir, R.L. and Malinow, R., 2007. Emotion enhances learning via norepinephrine regulation of AMPA-receptor trafficking. *Cell*, 131(1), pp.160-173.

General References:

Soderling TR, Derkach VA (2000) Postsynaptic protein phosphorylation and LTP. Trends Neurosci 23:75-80.
Mammen AL, Kameyama K, Roche KW, Huganir RL (1999) Phosphorylation of the a-amino-3-hydroxy-5-methylisoxazole-4-propionic acid receptor GluR1 subunit by calcium/calmodulin-dependent kinase II. *J Biol Chem* 272:32528-32533.

Roche KW, O'Brien RJ, Mammen AL, Bernhardt J, Huganir RL (1996) Characterization of multiple phosphorylation sites on the AMPA receptor GluR1 subunit. *Neuron* 16:1179-1188.

Hollmann M, Heinemann S (1994) Cloned glutamate receptors. Annu Rev Neurosci 17:31-108.
McGlade-McCulloh E, Yamamoto H, Tan S-E, Brickey DA, Soderling TR (1993) Phosphorylation and regulation of glutamate receptors by calcium/calmodulin-dependent protein kinase II. *Nature (London)* 362:640-642.

Keinänen K, Wisden W, Sommer B, Werner P, Herb A, Verdoorn TA, Sakmann B, Seeburg PH (1990) A family of AMPA-selective glutamate receptors. *Science* 249:556-560.