PhosphoSolutions®
Antibodies that work™

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Anti-GABA$_A$ Receptor, δ-Subunit, N-Terminus

Catalog Number: 868-GDN **Size:** 100 µl

Product Description: Affinity purified rabbit polyclonal antibody

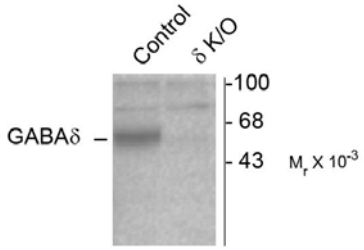
Applications: **WB**: 1:1000
IHC (frozen sections; Korpi et al. 2002): 1:250
IP: 10 µl per 50 µg lysate

Antigen: Fusion protein from the N-terminus of the δ-subunit of rat GABA$_A$ receptor.

Species reactivity: The antibody has been directly tested for reactivity in Western blots with rat and mouse tissue.

Biological Significance: *Gamma*-aminobutyric acid (GABA) is the primary inhibitory neurotransmitter in the central nervous system, causing a hyperpolarization of the membrane through the opening of a Cl^- channel associated with the GABA$_A$ receptor (GABA$_A$-R) subtype. GABA$_A$-Rs are important therapeutic targets for a range of sedative, anxiolytic, and hypnotic agents and are implicated in several diseases including epilepsy, anxiety, depression, and substance abuse. The GABA$_A$-R is a multimeric subunit complex. To date six αs, four βs and four γs, plus alternative splicing variants of some of these subunits, have been identified (Olsen and Tobin, 1990; Whiting et al., 1999; Ogris et al., 2004). Injection in oocytes or mammalian cell lines of cRNA coding for α- and β-subunits results in the expression of functional GABA$_A$-Rs sensitive to GABA. However, co-expression of a γ-subunit is required for benzodiazepine modulation. The various effects of the benzodiazepines in brain may also be mediated via different α-subunits of the receptor (McKernan et al., 2000; Mehta and Ticku, 1998; Ogris et al., 2004; Pöltl et al., 2003). More recently there have been a number of studies demonstrating that the δ-subunit of the receptor may affect subunit assembly (Korpi et al., 2002) and may also confer differential sensitivity to neurosteroids and to ethanol (Wallner et al., 2003; Wohlfarth et al., 2002).

Anti-GABA$_A$ Receptor, δ-Subunit



Western blot of mouse cerebellar lysates from wild type (Control) and δ-knockout (δ-K/O) animals showing specific immunolabeling of the ~52k δ-subunit of the GABA$_A$-R. The labeling was absent from a lysate prepared from δ-knockout animals.

WB = Western Blot **IF** = Immunofluorescence **IHC** = Immunohistochemistry **IP** = Immunoprecipitation
Packaging: 100 µl in 10 mM HEPES (pH 7.5), 150 mM NaCl, 100 µg per ml BSA and 50% glycerol. Adequate amount of material to conduct 10-mini Western Blots.
Storage and Stability. For long term storage –20°C is recommended. Stable at –20°C for at least 1 year.
Shipment: Domestic - Blue Ice; International – Blue Ice or Dry Ice.

Purification Method: Prepared from rabbit serum by affinity purification using a column to which the fusion protein immunogen was coupled.

Antibody Specificity: Specific for the ~52k δ-subunit of the $GABA_A$ receptor.

Quality Control Tests: Western blots performed on each lot.

References:

Korpi ER, Mihalek RM, Sinkkonen ST, Hauer B, Hevers W, Homanics GE, Sieghart W, Luddens H (2002) Altered receptor subtypes in the forebrain of $GABA_A$ receptor δ-subunit-deficient mice: recruitment of γ_2-subunits. Neurosci 109:733-743.

McKernan RM, et al. (2000) Sedative but not anxiolytic properties of benzodiazepines are mediated by the $GABA_A$ receptor α_1-subtype. Nature Neurosci 3:587-592.

Mehta AK, Ticku MK (1998) Prevalence of the $GABA_A$ receptor assemblies containing α_1-subunit in the rat cerebellum and cerebral cortex as determined by immunoprecipitation: Lack of modulation by chronic ethanol administration. Mol Brain Res 67:194-199.

Ogris W, Pöltl A, Hauer B, Ernst M, Oberto A, Wulff P, Höger H, Wisden W, Sieghart W (2004) Affinity of various benzodiazepine site ligands in mice with a point mutation in the $GABA_A$ receptor γ_2-subunit. Biochem Pharmacol 68:1621-1629.

Olsen RW, Tobin AJ (1990) Molecular biology of $GABA_A$ receptors. FASEB 4:1469-1480.

Pöltl A, Hauer B, Fuchs K, Tretter V, Sieghart W (2003) Subunit composition and quantitative importance of $GABA_A$ receptor subtypes in the cerebellum of mouse and rat. J Neurochem 87:1444-1455.

Wallner M, Hanchar HJ, Olsen RW (2003) From The Cover: Ethanol enhances $\alpha_4\beta_3\delta$ and $\alpha_6\beta_3\delta$ γ-aminobutyric acid type A receptors at low concentrations known to affect humans. Proc Natl Acad Sci (USA) 100:15218-15223.

Whiting PJ, Bonnert TP, McKernan RM, Farrar S, Le Bourdellès B, Heavens RP, Smith DW, Hewson L, Rigby MR, Sirinathsinghji DJS, Thompson SA, Wafford KA (1999) Molecular and functional diversity of the expanding $GABA_A$ receptor gene family. Ann NY Acad Sci 868:645-653.

Wohlfarth KM, Bianchi MT, Macdonald RL (2002) Enhanced Neurosteroid Potentiation of Ternary $GABA_A$ Receptors Containing the δ-Subunit. J Neurosci 22:1541-1549.

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