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## Product Information

### ANTI-GLUTAMATE RECEPTOR NMDAR1 (NR1) Developed in Rabbit, Affinity Isolated Antibody

Product Number **G 8913**

#### Product Description

Anti-Glutamate Receptor NMDAR1 (NR1) is developed in rabbit using a synthetic peptide K-PRRAIEREEGQLQLCSRHRES that corresponds to the C-terminus of NMDAR1 of rat origin (amino acids 918-938 with N-terminally added lysine) conjugated to KLH as immunogen. This sequence is identical in mouse NR1, human NR1 (short and long forms) and the rat NR1 isoforms NR1b, NR1c and NR1f. Affinity isolated antigen specific antibody is obtained by immunospecific purification using the NMDAR1 peptide.

Anti-Glutamate Receptor NMDAR1 (NR1) reacts specifically with NMDAR1 (116 kDa) derived from rat brain. By immunoblotting, the antibody detects NR1 from a rat brain synaptosomal fraction. Staining of the NMDAR1 band (116kDa) in immunoblotting is specifically inhibited with NMDAR1 peptide (rat, amino acids 918-938 with N-terminally added lysine).

Glutamate receptors are the major excitatory neurotransmitter receptors in the mammalian central nervous system (CNS) and play a central role in brain function and in neurodegenerative disease. Glutamate receptors are divided into two major categories: ionotropic receptors, which function as ligand-gated ion channels, and the metabotropic receptors (mGluRs) which are coupled via G-proteins to second messenger systems. The ionotropic receptors are subdivided into three pharmacologically distinct classes: the AMPA receptors, kainate receptors and the N-methyl-D-aspartate (NMDA) receptors.<sup>1,2</sup> The NMDA receptors are implicated in synaptic plasticity, neuronal development, learning and memory, and the pathogenesis of acute and chronic neurodegenerative disorders. Excessive stimulation of NMDA receptors, also known as glutamate excitotoxicity, can lead to neuronal cell death and may be a common final pathway in several pathological conditions, including

stroke, head injury, epilepsy and in neurodegenerative diseases such as Huntington's disease and Alzheimer's disease.<sup>3-5</sup> Molecular cloning has revealed a large family of genes encoding highly related NMDA receptor subunits.<sup>6-10</sup> These include the NMDAR1 (also termed NR1 or  $\zeta$ 1), and the NMDAR2A-NMDAR2D subunits (also termed NR2A-NR2D or  $\epsilon$ 1- $\epsilon$ 4 respectively). Alternative splicing can generate at least eight different NR1 isoforms with distinct functional properties.<sup>11</sup> Several lines of evidence indicate that natively expressed NMDA receptors comprise the NR1/ $\zeta$ 1 subunit and at least one member of the NR2 class, forming hetero-pentamer complexes, similar to other receptor ion channels. Gene targeting indicates that the subunits  $\zeta$ 1 and  $\epsilon$ 2 appear to be essential for NMDA receptor function and survival in newborn mice.<sup>12</sup> The NMDA receptors are highly permeable to  $\text{Ca}^{2+}$ ,  $\text{Na}^{+}$  and  $\text{K}^{+}$ , and contain modulatory sites for  $\text{Mg}^{2+}$ ,  $\text{Zn}^{2+}$ , glycine, protons and polyamines.<sup>2</sup> Tyrosine phosphorylation regulates the function of NMDA receptors, which are necessary for induction of long term potentiation (LTP), a mechanism proposed to underlie learning and memory.<sup>13</sup> Tyrosine phosphorylation of NMDA receptors may be principally mediated by the tyrosine kinase Src. The NMDA receptors interact through their C-terminus with post-synaptic cytoskeletal proteins. These include  $\alpha$ -actinin, and PSD-95 proteins that may be involved in the clustering of NMDA receptors at post-synaptic sites, attachment to cytoskeleton, and interaction with downstream signaling proteins, such as nNOS.<sup>14</sup> Antibodies reacting specifically with NMDA receptor subunits may be used to study their expression and function in a variety cell types and tissues and to correlate their expression pattern with physiological functions or pathological conditions.

### Reagents

The product is supplied as affinity isolated antibody in 0.01M phosphate buffered saline, pH 7.4, containing 1% BSA and 15 mM sodium azide as a preservative.

Protein concentration is approximately 0.5 mg/ml by  $E_{280}$  prior to the addition of BSA.

### Precautions and Disclaimer

Due to the sodium azide content a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazardous and safe handling practices.

### Storage/Stability

For continuous use, store at 2-8 °C for up to one month. For extended storage freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

### Product Profile

A minimum working dilution of 1:2,000 is determined by immunoblotting using a synaptosomal fraction of rat brain.

Note: In order to obtain best results and assay sensitivity in different techniques and preparations we recommend determining optimal working dilutions by titration test.

### References

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