



3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

Product Information

MONOCLONAL ANTI-GLUTAMATE CLONE GLU-4

Mouse Ascites Fluid

Product No. **G 9282**

Product Description

Monoclonal Anti-Glutamate (mouse IgG1 isotype) is derived from the GLU-4 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from an immunized mouse. L-glutamic acid (GLU) conjugated to KLH was used as the immunogen. The isotype is determined using Sigma ImmunoType™ Kit (Product Code ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Product Code ISO-2).

Monoclonal Anti-Glutamate reacts specifically with L-glutamate (L-glutamic acid, GLU), a major neurotransmitter in the central nervous system, when conjugated. Weak cross-reaction may be obtained with conjugated D-glutamate, L-glutamine, L-aspartate, D-aspartate, L-asparagine, β -alanine, glycine, 5-amino valeric acid, γ -amino-butyric acid (GABA) and glycyl-aspartate at the recommended working dilution using indirect and competitive ELISA.

Monoclonal Anti-Glutamate may be used for the localization of glutamate using indirect ELISA or immunohistology.

Several amino acids play a role as excitatory neurotransmitters in normal brain function. They are released from the terminals of one neuron and bind to receptors on the surface of adjacent neurons. Such amino acids exist in high concentrations in every part of the brain and play a vital role in almost all brain processes. At least five amino acids have been considered as neurotransmitters in the vertebrate brain: γ -amino-butyric acid (GABA), glutamate (GLU), aspartate (ASP), glycine and taurine.¹ Compelling evidence has been presented for GLU and ASP as the quantitatively most important excitatory transmitters in the vertebrate central nervous system (CNS). GLU and ASP meet many of the criteria required of a putative excitatory neurotransmitter. They are present in the brain in very high concentrations, present in synaptosomal fractions, sequestered by a specific high-affinity uptake mechanism, and released in a calcium-dependent manner in response to depolarizing stimuli.² Glutamate

is a substrate in several metabolic pathways, including those leading to the synthesis of glutamine and γ -amino-butyric acid (GABA). However, while several important neural pathways are now regarded as "GLU- or ASP-ergic", it seems likely that these amino acids when released in abnormal amounts play an important role in the pathogenesis of certain neurodegenerative diseases (e.g., Huntington's disease, Alzheimer's disease) and of the selective neuronal degenerations involved in epilepsy, ischemia, and hypoglycemia.^{1,3} Studies of the role glutamate plays in the CNS have been hampered by lack of specific and sensitive means for localizing glutamate to cells and neurons. In addition, because both GLU and ASP are sequestered into neurons by the same high-affinity uptake mechanism, analysis relying on uptake of radiolabeled amino acids to differentiate between neurons that may use one amino acid transmitter preferentially over the other does not give definitive results. Molecules such as GLU and ASP are too small to be immunogenic by themselves. They can function as haptens when conjugated to larger carriers and elicit the formation of antibodies that react specifically with the hapten itself.¹ Immunocytochemical localization of glutamate directly has been reported, employing polyclonal antisera that had been extensively purified before use.^{2,4,5} The development of high titer and specific monoclonal antibodies which distinguish between glutamate and aspartate, provides an additional tool for identification and study of these neurotransmitters.

Reagents

The product is provided as ascites fluid with 0.1% sodium azide as a preservative.

Precautions and Disclaimer

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 hazards and safe handling practices.

Product Profile

Minimum working dilution was determined to be 1:10,000 by indirect ELISA using *in situ* prepared L-glutamate-glutaraldehyde-BSA conjugate as coat.

In order to obtain best results, it is recommended that each individual user determine their optimum working dilutions by titration assay.

Storage

For continuous use, store at 2-8 °C for up to one month. For extended storage, solution may be frozen in working aliquots. Repeated freezing and thawing is **not** recommended. If slight turbidity occurs upon prolonged storage, clarify by centrifugation before use.

References

1. Petrusz, P., and Rustioni, A., in: "Techniques in Immunocytochemistry", Bullock, G., and Petrusz, P., (eds.), Vol. 4, pp. 253, Academic Press, London (1989).
2. Madl, J., et al., J. Histochem. Cytochem., **34**, 317 (1986).
3. Taylor, R., Science, **252**, 1380 (1991).
4. Helper, J., et al., J. Histochem. Cytochem., **36**, 13 (1988).
5. Storm-Mathisen, J., et al., Nature, **301**, 517 (1983).

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