

**Product No. A-7702**

**Lot 094H4821**

Monoclonal Anti-Aspartate  
Mouse Ascites Fluid  
Clone ASP-1

Monoclonal Anti-Aspartate (mouse IgG2a isotype) is derived from the ASP-1 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from an immunized mouse. L-aspartic acid (GLU) conjugated to KLH was used as the immunogen. The isotype is determined using Sigma ImmunoType<sup>TM</sup> Kit (Sigma Stock No. ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Sigma Stock No. ISO-2). The product is provided as ascites fluid with 0.1% sodium azide (see MSDS)\* as a preservative.

### **Specificity**

Monoclonal Anti-Aspartate reacts specifically with L-aspartate (L-aspartic acid, ASP), a major neurotransmitter in the central nervous system, when conjugated. Weak cross-reaction may be obtained with D-aspartate, L-glutamate, D-glutamate, L-glutamine, L-asparagine,  $\beta$ -alanine, glycine, 5-aminovaleric acid,  $\gamma$ -aminobutyric acid (GABA), glycyl-aspartate, glycyl-glutamate and aspartyl-glutamate at the recommended working dilution using indirect and competitive ELISA.

### **Working Dilution**

Working dilution was determined to be 1:10,000 by indirect ELISA using *in situ* prepared L-aspartate-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.

### **Description**

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 concentration in every part of the brain and play a vital role in almost all brain processes. At least five amino acids have been considered neurotransmitters in the vertebrate brain:  $\gamma$ -amino-butyric acid (GABA), glutamate (GLU), aspartate (ASP), glycine and taurine.<sup>1</sup> Compelling evidence has been presented for GLU and ASP as the quantitatively most important 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, they are present in synaptosomal fractions, sequestered by a specific high-affinity uptake mechanism, and released in a calcium-dependent manner in response to depolarizing stimuli.<sup>2</sup> Glutamate is a substrate in several metabolic pathways, including those leading to the synthesis of glutamine and  $\gamma$ -aminobutyric 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.<sup>1,3</sup> Studies of the role aspartate plays in the CNS have been hampered by lack of specific and sensitive means for localizing aspartate to specific cells and neurons. In addition, since 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 answers. 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.<sup>1</sup> Immunocytochemical localization of aspartate directly has been reported, employing polyclonal antisera that had been extensively purified before use.<sup>2,4,5</sup> The development of high titer and specific monoclonal antibodies which distinguish between aspartate and glutamate, provides an additional tool for identification and study of these neurotransmitters.

## Uses

Monoclonal Anti-Aspartate may be used for the localization of aspartate using indirect ELISA.

## Storage

For continuous use, store at 0-5°C. 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.

\*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.