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ProductInformation

Monoclonal Anti-DOPA Decarboxylase (DDC)
Clone DDC-109
Mouse Ascites Fluid

Product Number **D 0180**

Product Description

Monoclonal Anti-DOPA Decarboxylase (DDC) (mouse IgG2b isotype) is derived from the DDC-109 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from an immunized mouse. A synthetic human DDC N-terminal peptide corresponding to amino acids 24-39 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-DOPA Decarboxylase (DDC) reacts specifically with DDC (approx. 50 kDa) in immunoblotting assays. It may also be used in immunoprecipitation, immunocytochemistry and ELISA applications. Cross reactivity has been observed with human, monkey, bovine, sheep, rabbit, dog, guinea pig, and rat. In immunocytochemical labeling of brain tissue, the product stains the monoaminergic cells and proximal dendrites, but not cortical fibers.

Serotonin (5-HT, 5-hydroxytryptamine) is one of the best known biogenic amine neurotransmitters in the central nervous system (CNS).[1-4] It is selectively contained in neurons with cell bodies mainly located in the raphe area and with terminals diffusely distributed throughout the CNS. Serotoninergic cell bodies that send fibers mainly to the spinal cord are distributed in posterior raphe nuclei (nucleus raphe obscurus, pallidus, and magnus), whereas those with projections invading forebrain areas (i.e., striatum, hippocampus, hypothalamus, septum, amygdala, and cerebral cortex) belong to anterior raphe nuclei (nucleus raphe dorsalis, centralis superior, and linearis rostralis).

Outside the CNS, 5-HT is also present in the pineal gland, where it is mainly the precursor of melatonin. Serotoninergic neurons have been identified in the peripheral nervous system, notably in the plexus innervating the gut. These neurons seem to have metabolic properties very similar to those observed in central serotoninergic neurons. Two enzymatic steps are necessary for the synthesis of 5-HT from its natural precursor, tryptophan, an essential amino acid in mammals. After being taken up in serotoninergic neurons by a high-affinity carrier, tryptophan is first converted into 5-hydroxytryptophan (5-HTP) by tryptophan hydroxylase. The 5-HTP is then decarboxylated into 5-HT by aromatic L-amino acid decarboxylase, also known as DOPA decarboxylase (DDC, EC 4.1.1.28), which requires pyridoxal phosphate for its activity. This is the enzyme that also decarboxylates L-DOPA to form dopamine in both dopaminergic and noradrenergic neurons. DDC is found in a range of organs in addition to brain, for example, in the kidney and liver. The enzyme has been isolated and purified and is a 85-90 kDa molecular weight protein (approx. 50 kDa in denatured-reduced SDS-PAGE). Antibodies that react specifically with the enzyme enable the identification of both noradrenergic, dopaminergic, and serotoninergic systems, since DDC is present and active in all three types of neurons.

Reagents

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

Precautions and Disclaimer

Due to the sodium azide content a material safety 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

Store at 2-8 °C.

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

Monoclonal Anti-DOPA Decarboxylase (DDC) may be used for the localization of DDC using various immunochemical assays including ELISA, immunoblot, immunoprecipitation, and immunocytochemistry.

A working dilution of at least 1:1,000 was determined by immunoblotting using bovine brain extract.

In order to obtain best results, it is recommended that each user determine the optimal working dilution for individual applications by titration assay.

References

1. *Progress in Tryptophan and Serotonin Research* 1986, Bender, D., et al., (eds.), (Walter de Guyter, Berlin, 1987).
2. Hamon, M., et al., in: *Handbook of Neurochemistry*, Vol. 6 (*Receptors in the Nervous System*), Lajtha, A. (ed.), Chapter 6 (Plenum Press, New York, 1984).
3. *From Neuron to Brain: A Cellular and Molecular Approach to the Function of the Nervous System*, Nocholls, J., et al., (eds.), Chapter 9 (Sinauer Associates, Sunderland, Massachusetts, 1992).
4. Zhu, M. Y., and Juorio, A. V., Gen. Pharmacol., **26**, 681 (1995).

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