

Anti-Serotonin (5-Hydroxytryptamine, 5-HT)

Developed in Rabbit
Delipidized, Whole Antiserum

Product No. **S5545**

Lot No. 127H4813

Anti-Serotonin (5-Hydroxytryptamine, 5-HT) is developed in rabbit using serotonin creatinine sulfate complex conjugated to BSA as the immunogen. The antiserum has been treated to remove lipoproteins. Rabbit Anti-Serotonin is supplied as a liquid containing 0.1% sodium azide (see MSDS)* as preservative.

Specificity

Anti-Serotonin (5-HT) specifically stains enterochromaffin cells in formalin-fixed, paraffin-embedded sections of normal human appendix and serotonin-containing carcinoid tumors. In the central nervous system (CNS), the antiserum reacts with serotonin-containing fibers in perfusion-fixed, free-floating sections of rat brain. Specific staining is inhibited by preincubation of diluted antiserum with 500 μ M serotonin or 200 μ g/ml serotonin-BSA. No inhibition of staining is observed with L-tryptophan (L-Trp), 5-hydroxytryptophan (5-HTP), N-acetyl-5-hydroxytryptamine (N-acetylserotonin), or dopamine (3-hydroxytyramine, DA) at a concentration of 500 μ M.

Protein Concentration: 63 mg/ml by Biuret.

Working Dilutions

1. A dilution of 1:8,000 was determined by indirect immunohistology using formalin-fixed, paraffin-embedded normal human appendix and serotonin-containing carcinoid tumors.
2. A dilution of 1:5,000 was determined by indirect immunohistology using 4% paraformaldehyde perfusion-fixed, free-floating sections of rat brain. Anti-Serotonin specifically stains 5-HT-containing nerve fibers and varicosities projecting through or lying on the cerebral ventricular ependyma (CVE) in the lateral ventricles. No serotonin-positive fibers are observed in the ventral part of the third ventricle.

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

Description

Serotonin (5-hydroxytryptamine, 5-HT) is a widely distributed neurotransmitter and hormone in the mammalian central nervous system (CNS) and periphery.^{1,2} In the CNS, 5-HT is considered an inhibitory neurotransmitter regulating a wide range of sensory, motor and cortical functions. In the periphery, 5-HT is present in neural and non-neural structures, e.g. platelets, gastrointestinal tract (myenteric plexus, enterochromaffin cells), lungs (neuroepithelial cells), thyroid gland, spleen and in mast cells of certain species such as rat and mouse.^{2,3,4} 5-HT is involved in the regulation of diverse functions including blood pressure, gastrointestinal motility, pain perception, platelet aggregation, lymphocyte cytotoxicity and phagocytosis, appetite and sleep^{2,5} and is implicated in several pathological states including carcinoid tumors, migraine, and hypertension.^{6,7} In the CNS, 5-HT has been implicated in several neuropsychiatric disorders such as anxiety, depression and schizophrenia.⁷ The majority of serotonergic nerve terminals in the CNS originate in neuronal cell bodies of the raphe nuclei (dorsal, median), nucleus raphe obscurus (NRO) and nucleus raphe pallidus (NRP) in the brainstem^{4,8,9,10}, which project to specific areas of the brain and the spinal cord.^{9,10} 5-HT is found to co-exist with substance P (SP) in the brain¹¹ and in nerve terminals in the ventral horn of the spinal cord.^{11,12,13} 5-HT is formed by the decarboxylation of 5-hydroxy-tryptophan (5-HTP), its intermediate, which is formed by hydroxylation of L-tryptophan by tryptophan hydroxylase. In the CNS, the action of 5-HT is terminated by reuptake into the pre-synaptic terminal by specific 5-HT transporters. 5-HT is further degraded by monoamine oxidase (MAO). The multiple physiological effects of 5-HT in the CNS and periphery are mediated by at least four receptor classes, 5-HT₁, 5-HT₂, 5-HT₃ and 5-HT₄, based on their molecular weights, ligand binding properties and coupling to different signal transduction systems.¹⁴ The

5-HT₃ receptor is a ligand- gated ion channel, whereas the 5-HT₁ subfamily (5-HT_{1A-F}) of G-protein coupled receptors have nanomolar affinity for 5-HT and are negatively coupled to adenylate cyclase. Antibodies that react specifically with 5-HT are useful for the study of the mode of action, differential tissue expression and intracellular and subcellular localization of 5-HT in the CNS and peripheral nervous system as well as in neuroendocrine cells in digestive and respiratory systems.

Uses

Anti-Serotonin may be used for the detection of 5-HT by immunohistology in sections of formalin-fixed, paraffin-embedded normal gastrointestinal tract and its carcinoid tumors, and in paraformaldehyde-fixed, frozen or Vibratome tissue sections of CNS and peripheral tissue of various species (e.g. rat, cat, porcine, bovine, monkey and human), and may be used in various immunochemical methods such as ELISA and RIA. The visualization of 5-HT in neuronal cell bodies may require pretreatment of the animals with an axonal transport blocker, e.g. colchicine.

Storage

For continuous use, store at 2-8°C for a maximum of 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.

* 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.

References

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