Product Data Sheet: Tyrosine Hydroxylase

Cat. No:	MAB-94589
Conjugate:	Unconjugated
Size:	100 ug
Clone:	LNC1
Concentration:	1mg/ml
Host:	Ms
Isotype:	IgG1
Immunogen:	Full length human TH as expressed in and purified from E. coli.
Reactivity:	Hu, Ms, Rt
Applications:	Western Blot: 1:1,000-1:2,000 Immunofluorescence: 1:1,000 Immunocytochemistry: 1:1,000 Immunohistochemistry: 1:1,000
Molecular Weight:	58kDa
Purification:	Aff. Pur.
Background:	Tyrosine hydroxylase (TH) is a vital enzyme responsible for the generation of L-DOPA from the amino acid tyrosine. L-DOPA is the direct precursor of the neurotransmitter dopamine, and dopamine can itself be processed to produce the neurotransmitters adrenalin and noradrenalin (a.k.a. epinephrine and norepinephrin respectively). Neurons which use dopamine, adrenalin or noradrenaline, called collectively chatecholamines, must express TH. TH has a very restricted distribution in the brain but is highly expressed in the cells in which it is found. As a result antibodies to TH are useful for the identification of chatecholaminergic neurons. TH positive neurons in the rat are localized into clusters of cells most of which are in the brain stem, including notably the substantia nigra and locus ceruleus (1,2). The clusters of cells are usually referred to by a classification scheme based on that proposed by Dahlström and Fuxe, which labels cells in groups A1 – A17 and C1 to C3 (2). Subpopulations of neurons are localized in the olfactory bulb, habenula and retina. TH positive cells are also found in a subset of cells in the adrenal medulla, sympathetic ganglia, sensory ganglia and enteric ganglia (2). Numerous TH positive axons can be seen coursing through the striatum and to a much lesser degree the cortex originating from the mid brain A8, A9 and A10 nuclei. TH neurons have a huge impact on brain function and behavior but are relatively infrequent- the rat brain contains about 22,000 TH positive neurons in the A8, A9 and A10 nuclei out of a total of 200 million neurons (3). Parkinson's disease is caused by the loss of TH positive dopaminergic neurons in the substantia nigra, which are also relatively low in number (4), and perturbation of TH neurons has been implicated in Alzheimer's disease and schizophrenia (5-7). There is one mammalian gene which produces one mRNA transcript and one protein in rat but four alternate mRNA transcripts produce four slightly different forms of TH proteins in humans (8). MAB-94589 was made against full length recombinant human TH based on the 524 amino acid sequence in NP_954987.2, expressed in and purified from E. coli. The antibody works well on cells in culture and tissue sections.
Form:	Liquid
Buffer:	Purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN3
Storage:	Store at 4°C for short term, for longer term at -20°C

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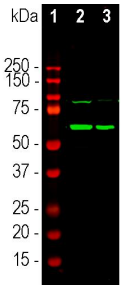
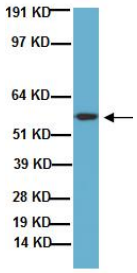
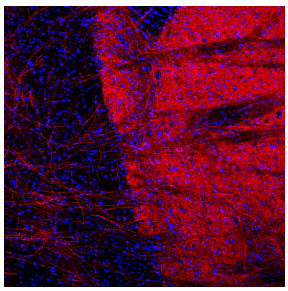
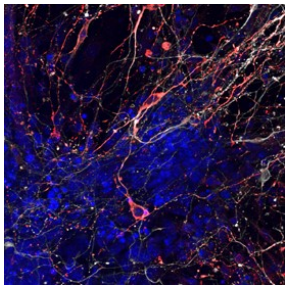




Western blot analysis of tissue and cell lysates using mouse mAb to tyrosine hydroxylase, MAB-94589, dilution 1:5,000 in green: [1] protein standard (red), [2] rat brain caudate/putmen and [3] PC12 cells. The strong band at about 58kDa corresponds to TH protein. The weak band at about 80kDa in the rat brain homogenate is of unknown origin, but does not affect the specific cell and process staining of this antibody.



Western Blot Analysis:
Mouse Brain lysate was resolved by electrophoresis, transferred to PVDF membrane and probed with anti-Tyrosine Hydroxylase 1:1000 dilution Proteins were visualized using a goat anti-mouse secondary antibody conjugated to HRP and a chemiluminescence detection system. Arrow indicates protein Tyrosine Hydroxylase (~59 kDa).



Immunofluorescent analysis of rat brain section stained with mouse mAb to tyrosine hydroxylase, MAB-94589, dilution 1:1,000, in red. The blue is Hoechst staining of nuclear DNA. Following transcardial perfusion of rat with 4% paraformaldehyde, brain was post fixed for 24 hours, cut to 45µM, and free-floating sections were stained with the above antibodies. The MAB-94589 antibody stains TH expressing neuronal processes, which are particularly numerous in the striatum, at the right of the image.

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