

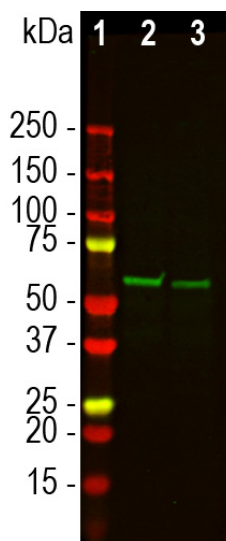
Ordering Information
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HGNC Name: TH
UniProt: P07101
RRID: AB_2923472
Immunogen: Full length human TH expressed in and purified from *E. coli*.
Format: Affinity purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaH₂PO₄
Storage: Stable at 4°C for one year, for longer term store at -20°C
Recommended dilutions:
WB: 1:2,000. IF/ICC 1:2,000

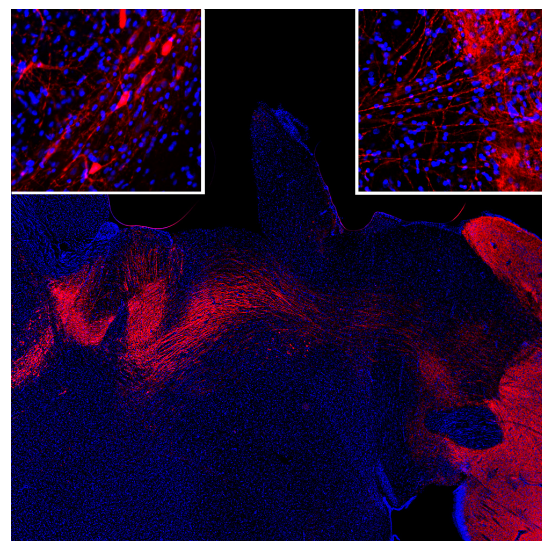
References:

1. Pickel VM, et al. Cellular localization of tyrosine hydroxylase by immunohistochemistry. *J. Histochem. Cytochem.* 23:1-12 (1975).
2. Bjorklund A, Dunnett SB. Dopamine neuron systems in the brain: an update. *Trends Neurosci.* 30:194-202 (2007).
3. German DC, Manaye KF. Midbrain dopaminergic neurons (nuclei A8, A9, and A10): three-dimensional reconstruction in the rat. *J. Comp. Neurol.* 331:297-309 (1993).
4. Daubner SC, Le T, Wang S. Tyrosine hydroxylase and regulation of dopamine synthesis. *Arch. Biochem. Biophys.* 508:1-12 (2011).
5. Haavik J, Toska K. Tyrosine hydroxylase and Parkinson's disease. *Mol. Neurobiol.* 16:285-309 (1988).
6. Torack RM, Morris C. Tyrosine hydroxylase-like (TH) immunoreactivity in Parkinson's disease and Alzheimer's disease. *J. Neural Transm. Park. Dis. Dement. Sect.* 4:165-71 (1992).
7. Benes FM, Todtenkopf MS, Taylor JB. Differential distribution of tyrosine hydroxylase fibers on small and large neurons in layer II of anterior cingulate cortex of schizophrenic brain. *Synapse* 25:80-92 (1997).
8. Lewis DA, Melchitzky DS, Haycock JW. Four isoforms of tyrosine hydroxylase are expressed in human brain. *Neuroscience* 54:477-92 (1993)

Applications	Host	Isotype	Molecular Wt.	Species Cross-Reactivity
WB, IF/ICC	Goat		~58kDa	Hu, Rt, Ms



Western blot analysis of different tissue lysates using goat pAb to tyrosine hydroxylase, GPCA-TH, dilution 1:2,000 in green: [1] protein standard (red), [2] rat brain caudate and putamen and [3] mouse brain caudate and putamen. The strong band at about 60kDa corresponds to TH protein.



Immunofluorescent analysis of rat brain sections stained with goat pAb to tyrosine hydroxylase, GPCA-TH, dilution 1:2,000, 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 above antibodies. GPCA-TH antibody strongly and specifically stains the striatal TH-expressing interneurons. Inset top left shows neuronal cell bodies and top right shows beaded process, while the main image shows an overview of the caudate/putamen and TH positive nerve fibers.

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. epinephrin and norepinephrin respectively). Neurons which use dopamine, adrenalin or noradrenalin, called collectively catecholamines, 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 catecholaminergic 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).

GPCA-TH was made against full length recombinant human TH based on the 524 amino acid sequence in [NP_054987.2](http://www.ncbi.nlm.nih.gov/nuccore/NP_054987.2), expressed in and purified from *E. coli*. The antibody works well on cells in culture and tissue sections. We also supply a mouse monoclonal and rabbit and chicken polyclonal antibodies to this protein, [MCA-4H2](#), [RPCA-TH](#) and [CPCA-TH](#) respectively.

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Abbreviation Key:

mAb—Monoclonal Antibody **pAb**—Polyclonal Antibody **WB**—Western Blot **IF**—Immunofluorescence **ICC**—Immunocytochemistry
IHC—Immunohistochemistry **E**—ELISA **Hu**—Human **Mo**—Monkey **Do**—Dog **Rt**—Rat **Ms**—Mouse **Co**—Cow **Pi**—Pig **Ho**—Horse **Ch**—Chicken
Dr—*D. rerio* **Dm**—*D. melanogaster* **Sm**—*S. mutans* **Ce**—*C. elegans* **Sc**—*S. cerevisiae* **Sa**—*S. aureus* **Ec**—*E. coli*.