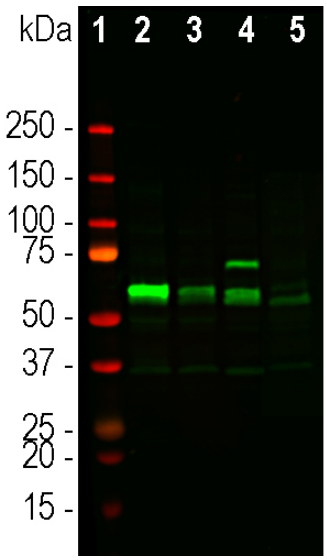
Tyrosine Hydroxylase Chicken Polyclonal Antibody

CPCA-TH

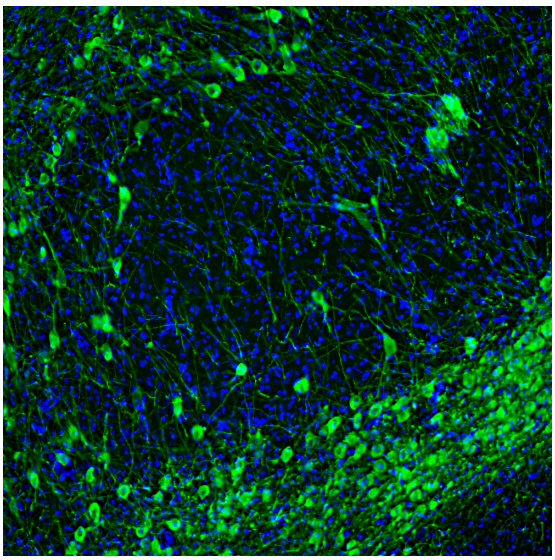
Ordering Information
Web *www.encorbio.com*
Email *admin@encorbio.com*
Phone *352-372-7022*
Fax *352-372-7066*

HGNC Name: *TH*
UniProt: *P07101*
RRID: *AB_2737416*
Immunogen: *Full length human TH as expressed in and purified from E. coli.*
Format: *Affinity purified antibody at 1mg/mL in 50% PBS, 50% glycerol plus 5mM NaN_3*
Storage: *Stable at 4°C for at least one year.*
Recommended dilutions:
WB: 1:50,000. IF/ICC and IHC: 1:10,000

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



Western blot analysis of different tissue lysates using chicken pAb to tyrosine hydroxylase, CPCA-TH, dilution 1:50,000 in green: [1] protein standard (red), [2] rat brain caudate/putmen region, [3] rat brain midbrain, [4] whole mouse brain and brain stem excluding cerebellum, and [5] segment of cow midbrain. The strong band at about 58kDa corresponds to the TH protein.



Immunofluorescent analysis of rat brain section stained with chicken pAb to tyrosine hydroxylase, CPCA-TH, dilution 1:5,000, in green. The blue is Hoechst staining of nuclear DNA. CPCA-TH antibody stains the dopaminergic TH-positive neurons and their processes of the substantia nigra.

Background: Tyrosine hydroxylase (TH) is a vital enzyme responsible for the generation of l-3,4-dihydroxyphenylalanine (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 either dopamine, adrenalin or noradrenaline, called collectively chatecholamines, must therefore 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). CPCA-TH 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 has an extremely high titre and can be used to study TH positive cells in culture and in sectioned material. The antibody has also been used to efficiently isolate TH positive PBMCs by FACS (9). We also supply a mouse monoclonal and a rabbit polyclonal antibodies to this protein, MCA-4H2 and RPCA-TH.

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. . 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) 9. Gopinath A, et al. J Immunol Methods doi:10.1016/j.jim.2019.112686 476:112686 (2020).

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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.