

# Product Datasheet

## Tyrosine Hydroxylase Antibody - Azide Free NB300-110

Unit Size: 0.1 ml

Store at -20C. Avoid freeze-thaw cycles.

[www.novusbio.com](http://www.novusbio.com)



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Updated 9/9/2025 v.20.1

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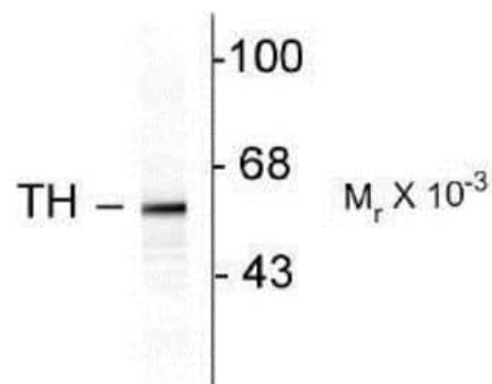


**NB300-110****Tyrosine Hydroxylase Antibody - Azide Free**

<b>Product Information</b>	
<b>Unit Size</b>	0.1 ml
<b>Concentration</b>	Please see the vial label for concentration. If unlisted please contact technical services.
<b>Storage</b>	Store at -20C. Avoid freeze-thaw cycles.
<b>Clonality</b>	Polyclonal
<b>Preservative</b>	No Preservative
<b>Isotype</b>	IgG
<b>Purity</b>	Antigen Affinity-purified
<b>Buffer</b>	10 mM HEPES (pH 7.5), 0.15 M NaCl, 0.1 mg/mL BSA, 50% Glycerol
<b>Target Molecular Weight</b>	60 kDa
<b>Product Description</b>	
<b>Description</b>	Novus Biologicals Sheep Tyrosine Hydroxylase Antibody - Azide Free (NB300-110) is a polyclonal antibody validated for use in IHC, WB and ICC/IF. Anti-Tyrosine Hydroxylase Antibody: Cited in 100 publications. All Novus Biologicals antibodies are covered by our 100% guarantee.
<b>Host</b>	Sheep
<b>Gene ID</b>	7054
<b>Gene Symbol</b>	TH
<b>Species</b>	Human, Mouse, Rat, Amphibian, Avian, Mammal, Rabbit, Reptile
<b>Reactivity Notes</b>	The antibody recognizes all mammalian and at least some non-mammalian forms of the enzyme in Western blot and in IHC/IF. Amphibian reactivity reported in scientific literature (PMID: 28867550).
<b>Marker</b>	Neuronal Marker
<b>Specificity/Sensitivity</b>	Specific for the ~60 kDa tyrosine hydroxylase protein.
<b>Immunogen</b>	SDS-denatured, native rat tyrosine hydroxylase purified from pheochromocytoma.
<b>Product Application Details</b>	
<b>Applications</b>	Western Blot, Immunohistochemistry-Paraffin, Immunocytochemistry/Immunofluorescence, Immunohistochemistry, Immunohistochemistry-Frozen, Immunohistochemistry Free-Floating, Single Cell Western
<b>Recommended Dilutions</b>	Western Blot 1:1000, Immunohistochemistry 1:10 - 1:500, Immunocytochemistry/Immunofluorescence, Immunohistochemistry-Paraffin, Immunohistochemistry-Frozen 1:1000, Immunohistochemistry Free-Floating, Single Cell Western
<b>Application Notes</b>	Immunocytochemistry use reported in literature (PMID 21694758). Immunohistochemistry-Paraffin use reported in literature (PMID 23690557) and customer review. Use in Immunohistochemistry free-floating reported in scientific literature (PMID 26553597).

## Images

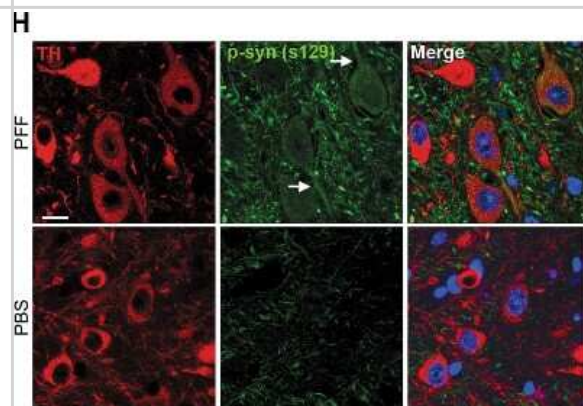
Western Blot: Tyrosine Hydroxylase Antibody [NB300-110] - Analysis of rat caudate lysate showing specific immunolabeling of the ~60 kDa tyrosine hydroxylase protein.



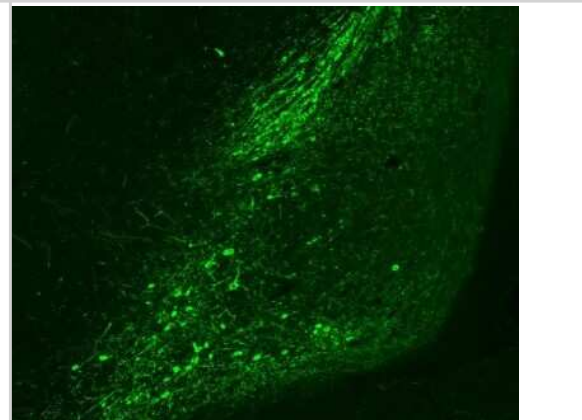
Western Blot: Tyrosine Hydroxylase Antibody [NB300-110] - Mice were injected with PBS (control group) or the dopaminergic neurotoxin MPTP. There is low concentration of TH in the striatum of mouse injected with MPTP. 30 ug total protein per lane. Antibody at 1:3000. Western blot image submitted by a verified customer review.



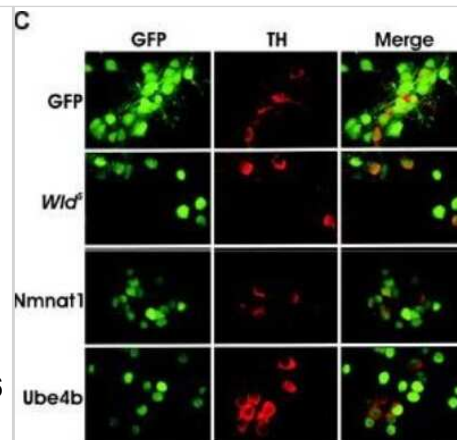
Immunocytochemistry/Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Alpha-Synuclein overexpression or intracerebral seeding impacts the dopaminergic system. Increased levels of ser129-phosphosynuclein in the substantia nigra (arrows) indicate alpha-syn stress in PFF injected animals. Image collected and cropped by CiteAb from the following publication (<http://pubmed.ncbi.nlm.nih.gov/30050065/>) licensed under a CC-BY license.



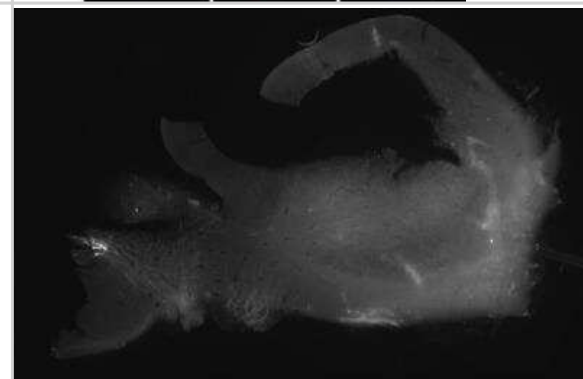
Immunohistochemistry: Tyrosine Hydroxylase Antibody [NB300-110] - Mouse cryo-sections. Antibody at 1:500. Secondary antibody: dk-anti-sp Alexa Fluor488 at 1:500; 1 h. IHC image submitted by a verified customer review.



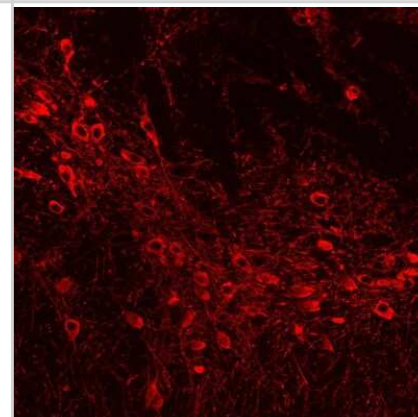
Immunocytochemistry/Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Nmnat by itself does not protect dopaminergic neurons from MPP+ toxicity. Similar transduction efficiencies of the different lentiviruses were confirmed by quantifying the number of TH+ and GFP+ cells following transduction of dopaminergic cultures. Quantification of TH+ cell bodies and (E) TH+ neurites show that only WldS-transduced cultures protected neurites against MPP+. Data are normalized to control cultures and denote the mean +/- SEM of representative determinations made in three separate cultures. \*p < 0.001. Image collected and cropped by CiteAb from the following publication (<https://molecularneurodegeneration.biomedcentral.com/articles/10.1186/1750-1326-7-5>), licensed under a CC-BY license.



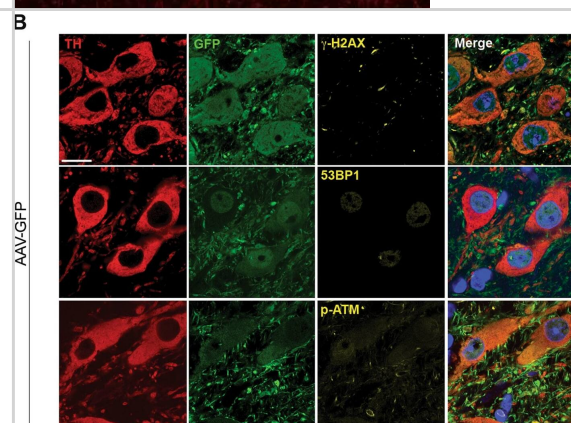
Immunohistochemistry-Paraffin: Tyrosine Hydroxylase Antibody [NB300-110] - Sagittal section of *Pleurodeles waltl* (amphibian) brain. The cell bodies of dopaminergic neurons in ventral tegmental area and dopaminergic fibers in striatum are stained with the TH antibody. IHC image submitted by a verified customer review.



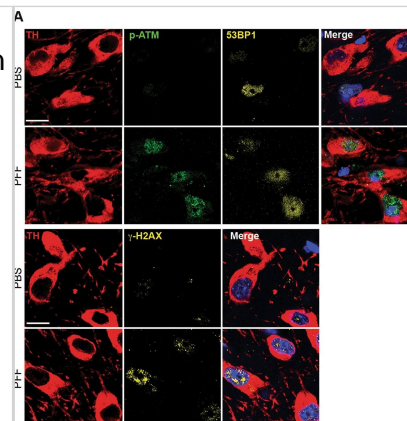
Immunohistochemistry: Tyrosine Hydroxylase Antibody [NB300-110] - Immunohistochemistry analysis of gelatin section of mouse brain (substantia nigra pars compacta) using Tyrosine Hydroxylase antibody. IHC image submitted by a verified customer review.



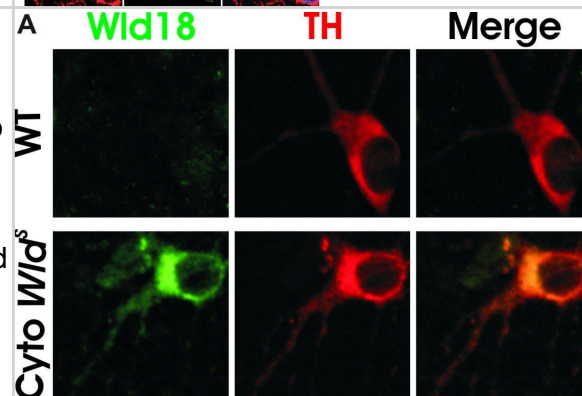
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Activation of the DDR in mice transduced with AAV2/6 h-syn.a h-syn expression increases 53BP1 &  $\gamma$ H2AX foci, & ATM phosphorylation in nigral dopaminergic neurons. b The DDR is not activated by viral delivery of GFP. Scale bar: 50  $\mu$ m. (\*\*p < 0.01; \*\*\*p < 0.001; Student's t test). All bar graphs show mean +/- s.e.m Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/30050065>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



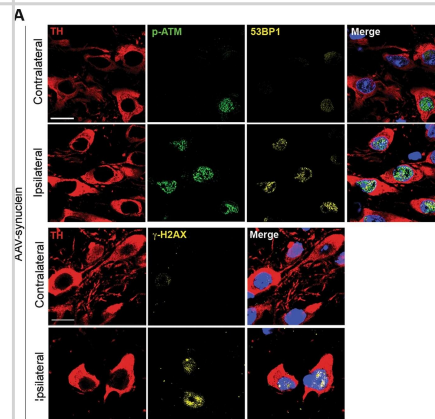
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Activation of the DDR in mice injected with  $\alpha$ -syn PFF in the striatum. Augmented levels 53BP1 &  $\gamma$ H2AX foci, & ATM phosphorylation in dopamine neurons of the substantia nigra. Scale bar: 50  $\mu$ m. (\*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; Student's t test). All bar graphs show mean  $\pm$  s.e.m Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/30050065>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



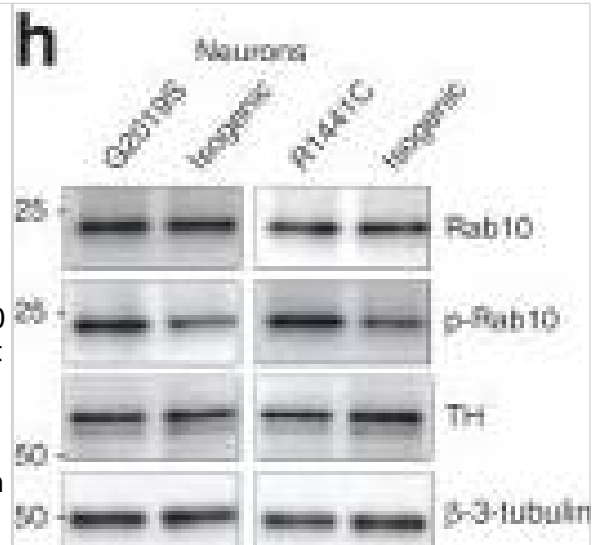
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Cytoplasmic Wlds protects dopaminergic neurons from MPP+ toxicity. (A) Dissociated dopaminergic cultures from both WT & cyto Wlds mice were co-stained with TH & Wlds antibodies to confirm the subcellular localization of Wlds. (B) Cultures were treated with 2  $\mu$ m MPP+ for 48 hours prior to fixing & staining. (C) Quantification of TH+ cell bodies & (D) TH+ neurites shows that cytoplasmic Wlds protected both cell bodies & neurites against MPP+. Data are normalized to control cultures & denote the mean  $\pm$  SEM of representative determinations made in three separate cultures. \* $p < 0.05$ . Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/22315973>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



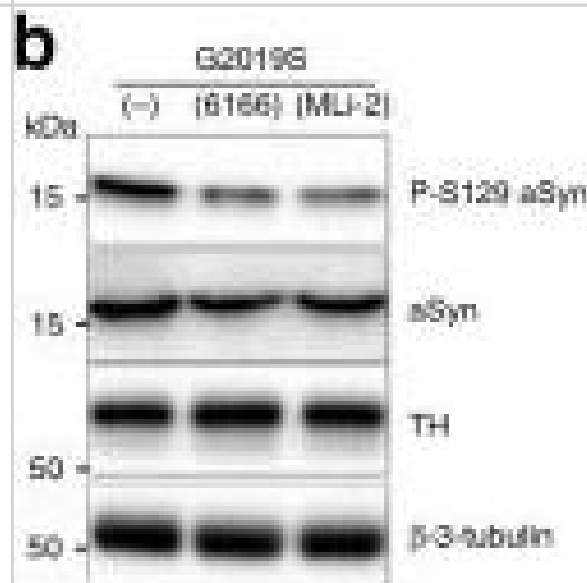
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Activation of the DDR in mice transduced with AAV2/6 h-syn. a h-syn expression increases 53BP1 &  $\gamma$ H2AX foci, & ATM phosphorylation in nigral dopaminergic neurons. b The DDR is not activated by viral delivery of GFP. Scale bar: 50  $\mu$ m. (\*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; Student's t test). All bar graphs show mean  $\pm$  s.e.m Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/30050065>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



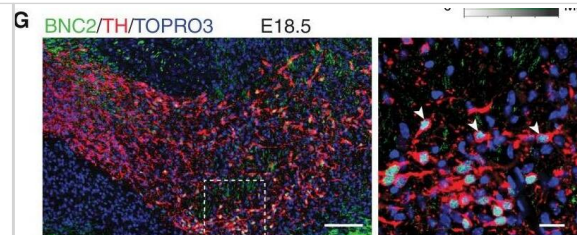
Western Blot: Tyrosine Hydroxylase Antibody [NB300-110] - Rab10 is a mediator of GCase activity by LRRK2 in fibroblasts & DA neurons. Western blot analysis of fibroblasts, from healthy controls or from patients with the LRRK2 G2019S mutation treated with lentivirus encoding Rab8 & Rab10 shRNA, probed for Rab8, Rab10, & GAPDH (loading control) a. Examination of relative lysosomal GCase activity in fibroblasts upon Rab8 & Rab10 knock-down b–e. Western blot analysis of fibroblasts from 3 patients with LRRK2 G2019S & from 3 healthy controls were probed for phospho-Rab10 (p-Rab10), Rab10, and GAPDH (loading control). The data is presented as the average p-Rab10 signal for the 3 G2019S samples relative to the 3 controls f. Western blot analysis of fibroblasts from 3 controls treated with MLI-2 were probed for phospho-Rab10 (p-Rab10), Rab10, GCase, & tubulin (loading control). Data is presented as the ratio of p-Rab10 to total Rab10 for the treated relative to untreated cells g. Representative western blots of lysates from LRRK2 G2019S & R1441C DA neurons relative to the corresponding isogenic controls h or relative to MLI-2 treated neurons i were probed for p-Rab10, Rab10 &  $\beta$ -3-tubulin (loading control). The data are presented as the mean  $\pm$  SEM,  $n = 3$ ; \* $p < 0.05$ , \*\* $p < 0.01$ , using one-way ANOVA followed by Tukey's multiple comparison post hoc test b–e, or paired two-tailed t-test f, g. Source data are provided as a Source Data file. Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/31804465>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



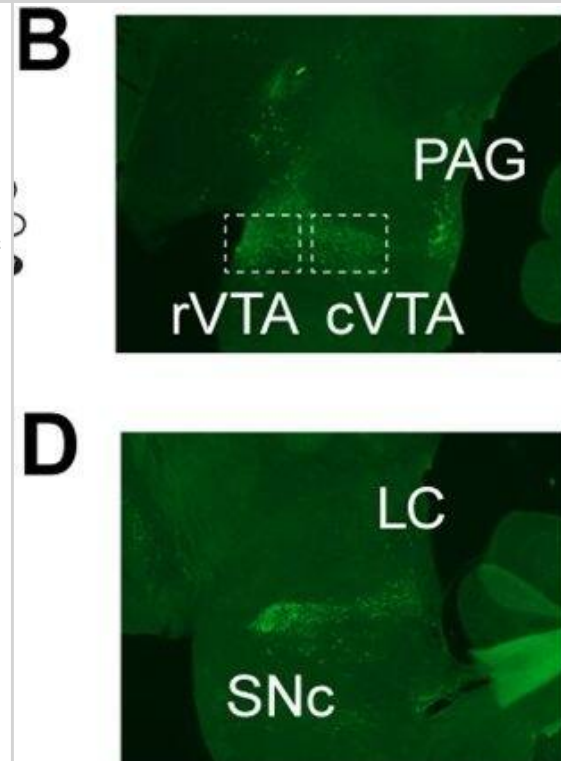
Western Blot: Tyrosine Hydroxylase Antibody [NB300-110] - LRRK2 kinase inhibitors rescue PD-related pathophysiologic phenotypes in LRRK2 & GBA1 mutant neurons. Measurement of insoluble oxidized dopamine by near-IR fluorescence from LRRK2 G2019S.a & R1441C c mutant DA neurons treated with 6166 or MLI-2. Treated cultures were also subjected to western blot analysis of phospho-S129 aSyn (P-S129), total aSyn, & tyrosine hydrolase (TH) with  $\beta$ -3-tubulin used as a loading control b, d. Measurement of relative levels of insoluble oxidized dopamine by near-IR fluorescence from DA neurons containing GBA1 E326K e or N370S h mutations. Treated cultures were also subjected to western blot analysis of P-S129, total aSyn, & TH with  $\beta$ -3-tubulin used as a loading control f, i. Representative images from additional DA neurons containing GBA1 E326K g or N370S j mutations treated with MLI-2 & stained with antibodies targeted to P-S129 &  $\beta$ -3-tubulin, scale bars, 50  $\mu$ m. The data are presented as the mean  $\pm$  SEM,  $n = 3$ ; \* $p < 0.05$ , \*\* $p < 0.01$  relative to untreated, one-way ANOVA followed by Tukey's multiple comparison post hoc test. Source data are provided as a Source Data file. Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/31804465>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



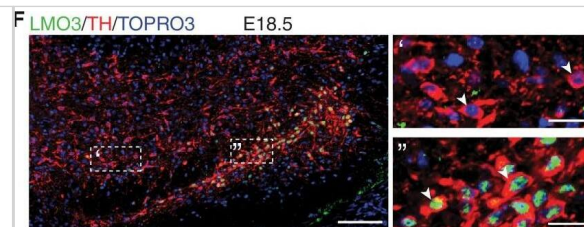
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Comparison of Mouse & Human Dopaminergic Neuronal Development (A) WNT1 compartments marking lateral population of the floor plate in human & mouse tissue (scale bar, 100  $\mu$ m). (B) Bar plot of cell types of the human & mouse dopaminergic lineage, showing the expression of key genes. Bars show average mRNA expression, scaled to the absolute molecule counts indicated on the right axis. Error bars show SEM. (C) Validation of mNBM by in situ hybridization for *Igfbp1* & *Nhlh1* (scale bar, 50  $\mu$ m). (D) Neuroblasts in human & mouse ventral midbrain (scale bar, 100  $\mu$ m; magnification, 20  $\mu$ m). (E) Selected genes showing similar (left) or distinct (right) expression in mouse & human ventral midbrain. Blue, expressed above baseline in mouse (>99.8% posterior probability); green, expressed above baseline in human (>99.8% posterior probability); gray, not expressed above baseline. (F) Validation of LMO3 expression by immunohistochemistry in a subset of TH+ neurons in the E18.5 mouse ventral midbrain (scale bar left, 100  $\mu$ m; right, 20  $\mu$ m). (G) Validation of BNC2 expression by immunohistochemistry in TH+ neurons in the E18.5 mouse ventral midbrain (scale bar left, 100  $\mu$ m; right, 20  $\mu$ m). Image collected & cropped by CiteAb from the following publication (<https://linkinghub.elsevier.com/retrieve/pii/S0092867416313095>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



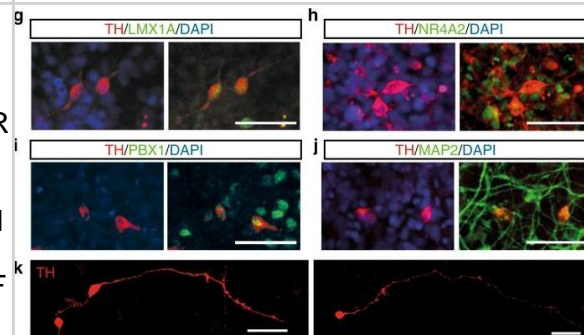
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Developmental song exposure & social context affect cFOS expression in TH neurons of the caudal VTA. Sagittal drawings (A,C) & photomicrographs of tyrosine hydroxylase (TH; green label) expression (B,D) in the ventral tegmental area (VTA) & periaqueductal gray (PAG; panels A,B), & the substantia nigra pars compacta (SNc) & locus coeruleus (LC; panels C,D). (E) Examples of co-localized expression of TH (green) & cFOS (red) in the caudal VTA of a normally-reared bird that heard silence (left panel), UD song (middle panel; UD song) & FD song (FD; right panel). White arrows indicate examples of colocalized expression. (F) Percent of TH neurons co-localized with cFOS in the caudal VTA (cVTA), rostral VTA (rVTA) & SNc. Box-and-whisker plots for normally-reared (yellow colors) & song-naïve (green colors) hearing UD (UD; lighter colors) or female-directed (FD; darker colors) songs. Each box spans the interquartile range, horizontal white lines indicate the median & whiskers show the minima & maxima. Levels of cFOS expression in TH neurons for silence controls are plotted as the mean (gray dashed line)  $\pm$  standard error (gray boxes). \*Indicates a significant difference at  $p < 0.05$  for all comparisons within a brain area. Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/30082796>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



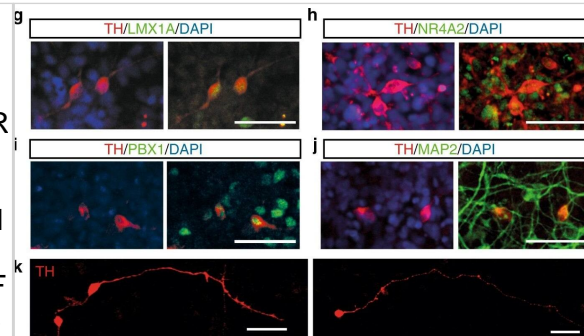
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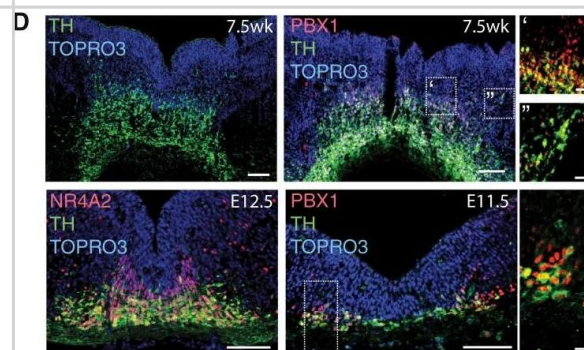
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Conversion of hNES cells into hPRogFPM & their differentiation into midbrain dopaminergic neurons. a Schematic representation of the conversion & differentiation protocols. b, c RT-qPCR analysis at day 8, showing the expression of midbrain-hindbrain TFs, such as OTX2, GBX2, LMX1A, & FOXA2 (b), as well as the dopaminergic neuron markers, NR4A2, TH, SLC18A2, & SLC6A3 (c). d Immunocytochemistry analysis of the presence of OTX2 & TH in control unconverted NES cultures, compared with NES cells converted with SAF + Dkk1 & differentiated until day 8. e, f Percentage of OTX2+ & TH+ cells in the conditions in d.  $P = 0.02673$  (e),  $P = 0.03233$  (f),  $n = 3$ . g-i Expression of the key midbrain TFs, LMX1A, NR4A2, & PBX1, in TH+ cells derived from SAI2-NES cells after conversion & differentiation. j, k TH+ cells express the mature neuronal marker, MAP2 (j), & some acquire mature neuronal morphologies, with long processes & varicosities at day 8 (k). Scale 50  $\mu$ m. Box plots (b, c, e, f): Center line, median; hinges, 25% & 75% quartiles; whiskers, 1.5 interquartile range. Statistics: (b, c) ANOVA, followed by pair-wise t-test with Bonferroni correction for multiple testing. (e, f). Two sample t-test; \* $P \leq 0,05$ ; \*\* $P \leq 0,01$ ; \*\*\* $P \leq 0,001$ .  $N = 3$  (GBX2, FOXA2, TH, SLC6A3),  $n = 4$  (LMX1A, OTX2, NR4A2, SLC18A2) Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/29968757>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



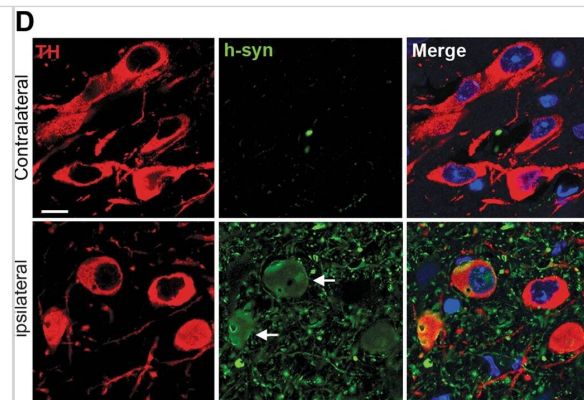
Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Conversion of hNES cells into hPRogFPM & their differentiation into midbrain dopaminergic neurons. a Schematic representation of the conversion & differentiation protocols. b, cRT-qPCR analysis at day 8, showing the expression of midbrain-hindbrain TFs, such as OTX2, GBX2, LMX1A, & FOXA2 (b), as well as the dopaminergic neuron markers, NR4A2, TH, SLC18A22, & SLC6A3 (c). d Immunocytochemistry analysis of the presence of OTX2 & TH in control unconverted NES cultures, compared with NES cells converted with SAF +Dkk1 & differentiated until day 8. e, f Percentage of OTX2+ & TH+ cells in the conditions in d.  $P = 0.02673$  (e),  $P = 0.03233$  (f),  $n = 3$ . g–i Expression of the key midbrain TFs, LMX1A, NR4A2, & PBX1, in TH+ cells derived from SAI2-NES cells after conversion & differentiation. j, k TH+ cells express the mature neuronal marker, MAP2 (j), & some acquire mature neuronal morphologies, with long processes & varicosities at day 8 (k). Scale 50 $\mu$ m. Box plots (b, c, e, f): Center line, median; hinges, 25% & 75% quartiles; whiskers, 1.5 interquartile range. Statistics: (b, c) ANOVA, followed by pair-wise t-test with Bonferroni correction for multiple testing. (e, f). Two sample t-test; \* $P \leq 0,05$ ; \*\* $P \leq 0,01$ ; \*\*\* $P \leq 0,001$ .  $N = 3$  (GBX2, FOXA2, TH, SLC6A3),  $n = 4$  (LMX1A, OTX2, NR4A2, SLC18A2) Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/29968757>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] - Comparison of Mouse & Human Dopaminergic Neuronal Development(A) WNT1 compartments marking lateral population of the floor plate in human & mouse tissue (scale bar, 100  $\mu$ m).(B) Bar plot of cell types of the human & mouse dopaminergic lineage, showing the expression of key genes. Bars show average mRNA expression, scaled to the absolute molecule counts indicated on the right axis. Error bars show SEM.(C) Validation of mNbm by in situ hybridization for Igfbp1 & Nhlh1 (scale bar, 50  $\mu$ m).(D) Neuroblasts in human & mouse ventral midbrain (scale bar, 100  $\mu$ m; magnification, 20  $\mu$ m).(E) Selected genes showing similar (left) or distinct (right) expression in mouse & human ventral midbrain. Blue, expressed above baseline in mouse (>99.8% posterior probability); green, expressed above baseline in human (>99.8% posterior probability); gray, not expressed above baseline.(F) Validation of LMO3 expression by immunohistochemistry in a subset of TH+ neurons in the E18.5 mouse ventral midbrain (scale bar left, 100  $\mu$ m; right, 20  $\mu$ m).(G) Validation of BNC2 expression by immunohistochemistry in TH+ neurons in the E18.5 mouse ventral midbrain (scale bar left, 100  $\mu$ m; right, 20  $\mu$ m). Image collected & cropped by CiteAb from the following publication (<https://linkinghub.elsevier.com/retrieve/pii/S0092867416313095>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



Immunocytochemistry/ Immunofluorescence: Tyrosine Hydroxylase Antibody [NB300-110] -  $\alpha$ -Synuclein overexpression or intracerebral seeding impacts the dopaminergic system. a–c Intranigral injection of AAV2/6 serotype expressing human  $\alpha$ -syn (h-syn) results in increased protein expression paralleled by reduction in tyrosine hydroxylase (TH) levels. (d) h-syn is also expressed in dopaminergic cell bodies (arrows). e Unbiased stereological counts demonstrate a reduction in nigral dopaminergic cell bodies. f, g Intracranial injection of  $\alpha$ -syn pre-formed fibrils (PFF) causes striatal dopaminergic denervation as evidenced by a reduction in TH immunoreactivity. h Increased levels of ser129-phosphosynuclein in the substantia nigra (arrows) indicate  $\alpha$ -syn stress in PFF injected animals. i Unbiased stereological counts showing a decrease in dopaminergic cell bodies in the substantia nigra. Scale bars: 1 mm in a, b 50  $\mu$ m in d. (\*\* $p < 0.01$ ; \*\*\* $p < 0.001$ ; Student's t test). All bar graphs show mean  $\pm$  s.e.m Image collected & cropped by CiteAb from the following publication (<https://pubmed.ncbi.nlm.nih.gov/30050065>), licensed under a CC-BY license. Not internally tested by Novus Biologicals.



## Publications

Li, W;Morarach, K;Liu, Z;Banerjee, S;Chen, Y;Harb, AL;Kosareff, JM;Hall, CR;López-Redondo, F;Jalalvand, E;Mohamed, SH;Mikhailova, A;Linden, DR;Marklund, U; The transcriptomes, connections and development of submucosal neuron classes in the mouse small intestine *Nature neuroscience* 2025-06-01 [PMID: 40442499]

Bullova P, Cui P, Arceo M et al. Postnatal sustentacular cells as chromaffin progenitors and tumor cells of origin in VHL-related paragangliomas *NPJ precision oncology* 2025-10-15 [PMID: 41093965]

García-Revilla J, Boza-Serrano A, Jin Y et al. Galectin-3 shapes toxic alpha-synuclein strains in Parkinson's disease *Acta Neuropathologica* 2023-07-01 [PMID: 37202527]

Lai JI, Porcu A, Romoli B et al. Nicotine-Mediated Recruitment of GABAergic Neurons to a Dopaminergic Phenotype Attenuates Motor Deficits in an Alpha-Synuclein Parkinson's Model *International Journal of Molecular Sciences* 2023-02-20 [PMID: 36835612]

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