

Neural markers guide

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progress faster



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Neuroscience

Neuroscience remains at the forefront of scientific exploration and discovery, with current research striving to understand the molecular, cellular and functional processes of the nervous system and their role in development, aging, and disease.

Amyotrophic Lateral Sclerosis
肌萎縮側索硬化症



Alzheimer's disease
阿茲海默症



Multiple sclerosis
多發性硬化症



Traumatic brain injury
創傷性腦損傷



Parkinson's disease
帕金森氏症



Huntington's disease
亨丁頓舞蹈症



Cell type	Markers
Neuroepithelial cells	Nestin, SOX2, Notch1, HES1, HES3, E-cadherin, occludin.
Radial glia	Vimentin, nestin, PAX6, HES1, HES5, GFAP, GLAST, BLBP, TN-C, N-cadherin, SOX2.
Intermediate progenitors	TBR2, MASH1/Ascl1.
Immature neurons	Doublecortin, beta III tubulin, NeuroD1, TBR1, stathmin1.
Oligodendrocyte precursor cells	PDGF receptor alpha, NG2.
Mature oligodendrocytes	Olig1, olig2, olig3, MBP, OSP, MOG, SOX10.
Schwann cells	MPZ, NCAM, GAP43, S100, P75NTR.
Astrocytes	GFAP, EAAT1/GLAST, EAAT2/GLT-1, glutamine synthetase, S100 beta, ALDH1L1.
Microglia	TMEM119, CD11b, CD45, Iba1, CX3CR1, F4/80, CD68, CD40.
Mature neurons	NeuN, MAP2, 160 kDa neurofilament medium, 200kDa neurofilament heavy, synaptophysin, PSD95.
Glutamatergic neurons	VGLUT1, VGLUT2, NMDAR1, NMDAR2B, glutaminase, glutamine synthetase.
GABAergic neurons	GABA transporter 1, GABABreceptors 1 and2, GAD65, GAD67.
Dopaminergic neurons	Tyrosine hydroxylase, dopamine transporter, FOXA2, GIRK2, Nurr1, LMX1B
Serotonergic neurons	Tryptophan hydroxylase, serotonin transporter, Pet1.
Cholinergic neurons	Cholineacetyltransferase, vesicular acetylcholine transporter, acetylcholinesterase

The markers shown in the guide are suggestions based on commonly used markers in published literature. There is often overlap in markers between different cell types, therefore we advise combining multiple markers and observing ultrastructural features where possible.



Neural markers

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Neuroepithelial cells

Nestin	ab105389
SOX2	ab92494
Notch1	ab52627
HES1 and HES3	ab108937
E-cadherin and Occludin	ab40772
SOX10	ab155279

Radial glia

Vimentin and Nestin	ab92547
PAX6	ab195045
HES1 and HES5	ab194111
Astrocytic markers: GFAP, GLAST, and BLBP	ab279649
Adhesion and extracellular matrix molecules: TN-C and N-Cadherin	ab76011
SOX2	ab93689

Immature neurons and intermediate progenitors

Intermediate progenitors TBR2

TBR2	ab216870
MASHT1 (Ascl1)	ab211327

Immature neurons

Doublecortin	ab207175
Beta III tubulin	ab52623
NeuroD1	ab213725
TBR1	ab183032
Stathmin 1	ab52630

Oligodendrocytes and oligodendrocyte precursor cells

Oligodendrocyte precursor cells

PDGFR	ab216870
alpha NG2	ab211327

Oligodendrocytes

Olig2	ab207175
Oligodendrocyte specific protein (OSP) and myelin oligodendrocyte glycoprotein (MOG)	ab52623
Myelin basic protein (MBP)	ab183032
SOX10	ab52630

Schwann cells and Schwann cell precursors

Myelin protein zero (MPZ) NCAM1	ab183868
GAP43	ab75813
SI00B	ab75810
Dhh	ab552642
	ab270453

Astrocytes

GFAP	ab68428
EAAT1 (GLAST)	ab181036
EAAT2 (GLT-1)	ab205248
Glutamine synthetase	ab176562
SI00B	ab52642
ALDH1L1	ab177463

Microglia

CD11b and CD45	ab1211
Iba1	ab178846
F4/80	ab16911
CD68	ab283654
CD40	ab224639

Mature neurons

NeuN	ab177487
MAP2	ab183830
160 kDa Neurofilament medium	ab254348
200 kDa Neurofilament heavy	ab207176
Synaptophysin	ab32127
PSD95	ab238135

Glutamatergic neurons

vGluT1	ab227805
vGluT2	ab216463
NMDAR1	ab109182
NMDAR2B	ab254356
Glutaminase	ab156876
Glutamine synthetase	ab176562

GABAergic neurons

GABA transporter 1 (GAT1)	ab259971
GABAB receptor 1 and 2	ab238130
GAD65	ab239372
GAD67	ab213508

Dopaminergic neurons

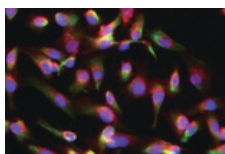
Tyrosine hydroxylase (TH)	ab75875
Dopamine transporter (DAT)	ab184451
FOXA2	ab108422
GIRK2	ab259909
Nurr1	ab41917
LMX1B	ab259926

Serotonergic neurons

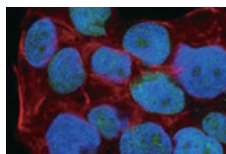
Tryptophan hydroxylase (TPH)	ab52954
Serotonin transporter	ab254358
Pet1	ab221724

Cholinergic neurons

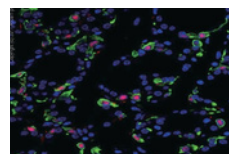
Choline acetyltransferase (ChAT)	ab178850
Vesicular acetylcholine transporter (VACHT) Acetylcholinesterase	ab183591



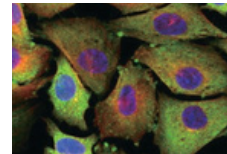
Neural progenitor cells derived from human iPSCs stained red with anti-Nestin (ab105389).



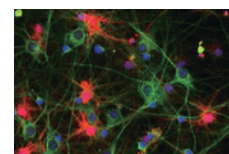
Human embryonic carcinoma epithelial cells stained green with anti-SOX2 (ab93689).



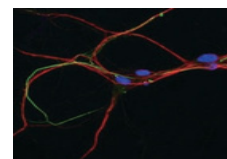
Mouse thyroid tissue stained red with anti-MASH1 (ab211327).



Human neuroblastoma cell line stained green with anti-Myelin basic protein (ab209328).



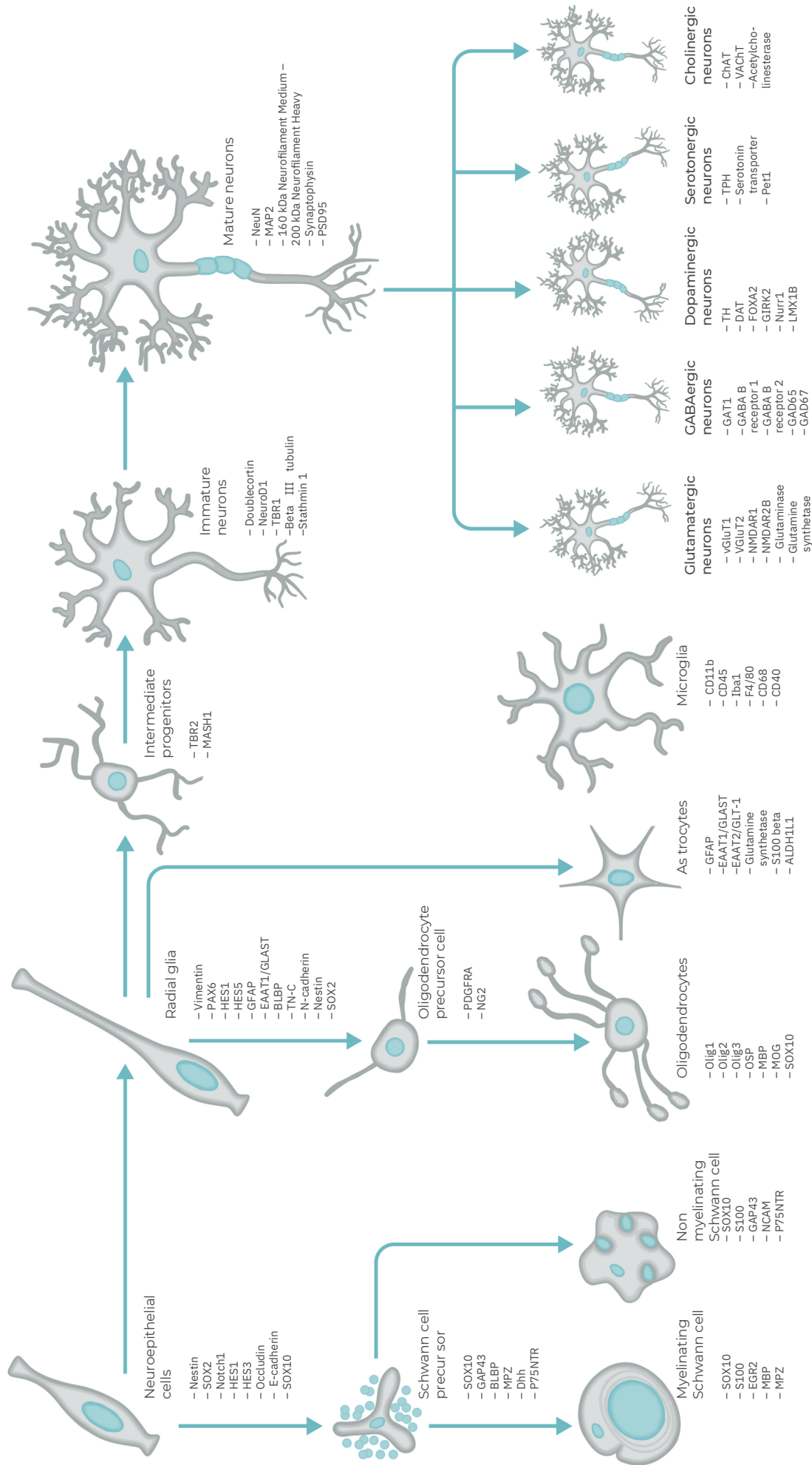
E18 rat hippocampal glia stained in red with anti-SI00 beta (ab52642).



Mouse primary neuros stained green using anti-160 kDa neurofilament medium (ab254348).



Neural lineage markers at a glance



Find out more

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