

NEUROSCIENCE MARKER PANEL



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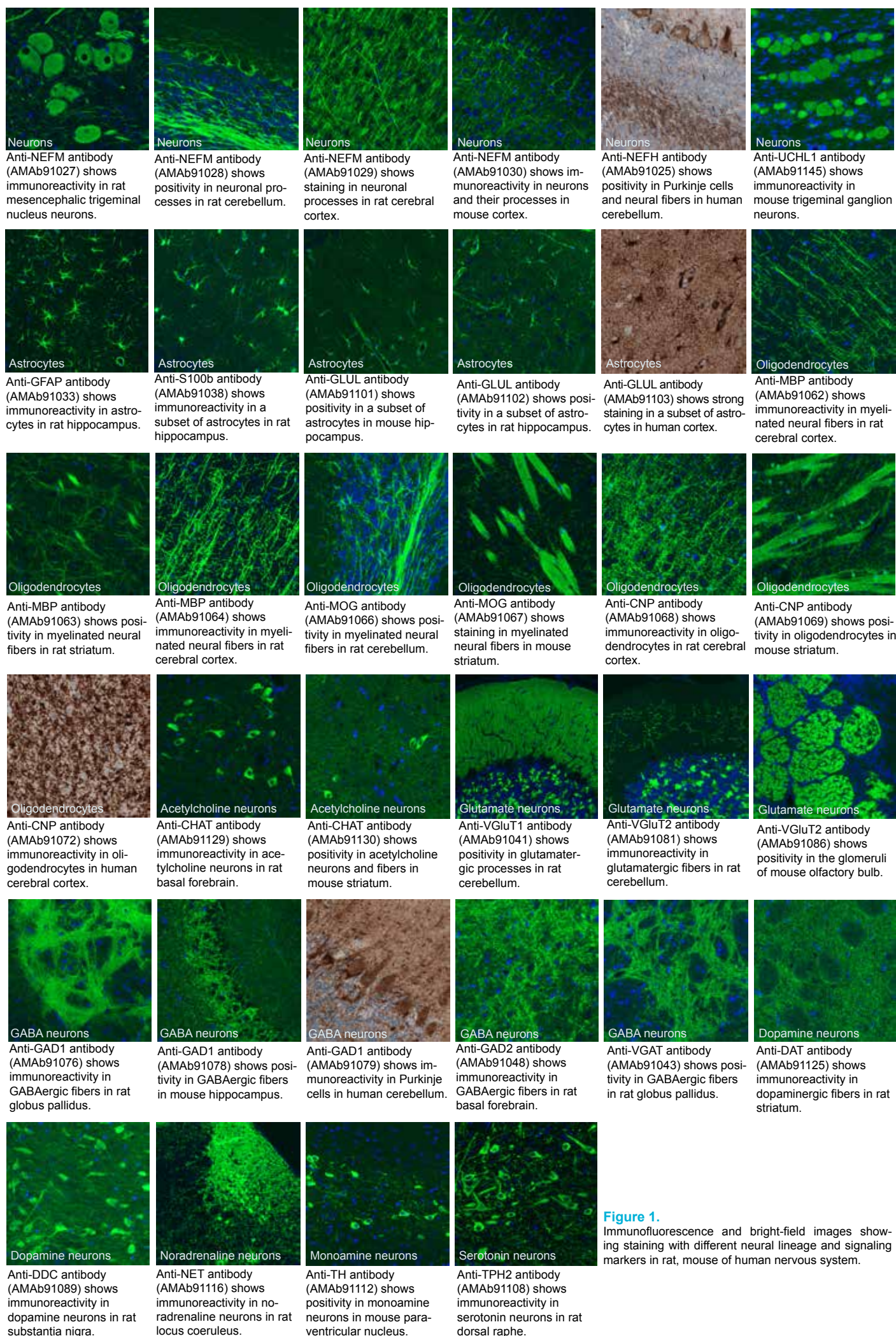


Figure 1. Immunofluorescence and bright-field images showing staining with different neural lineage and signaling markers in rat, mouse or human nervous system.

PrecisA Monoclonals as Neuroscience Markers

The Neuroscience Marker Panel

The nervous system is the system controlling and regulating both involuntary and voluntary processes in the organism, including the higher-order functions, such as perception, cognition, emotions and others.

The principal cells of the nervous system are the neurons, which process and transmit neural signals. In addition, different types of glial cells are present, including astrocytes, oligodendrocytes and Schwann cells that support, nourish and provide electrical isolation to the neural processes. The complexity of the nervous system is further augmented by the fact that different types of neurons utilise different types of chemical substances to transmit the information (chemical neurotransmitters) and that multiple receptor subtypes are present.

Antibody-based immunohistochemistry is widely used in neuroscience research to detect and characterize various cell types in the nervous system, and the need for highly-characterised and specific antibodies is still high.

At Atlas Antibodies we have therefore developed a novel panel of PrecisA Monoclonals antibodies designed to recognize the main anatomical and neurochemical cell types in rodent and human nervous system. We have taken a great care to be able to offer these markers as tools for mapping the structures and cell types in the central and peripheral nervous system:

- Selected target proteins are expressed only by a single cell type
- IHC-validation in rat, mouse and human tissues
- WB-validation in mouse and human tissue lysates for the majority of the markers
- Antibodies are available with different isotypes, allowing for multiplexing experiments
- Information on antigen used for immunisation and epitope information are provided (when available)

The monoclonal antibodies within the panel have been developed under the same stringent conditions as all PrecisA Monoclonals, guaranteeing a secured continuity and stable supply.

Markers for Neural Lineage and Signaling

The Neuroscience Marker panel consists of neural lineage markers for neurons, astrocytes and oligodendrocytes/Schwann cells. The signaling markers target glutamate, GABA, acetylcholine, noradrenaline, dopamine and serotonin systems.

The three different cell types, including neurons, oligodendrocytes and astrocytes, are shown in Figure 2. The antibodies used are Anti-NEFM (AMAb91030), Anti-CNP (AMAb91068) and Anti-GFAP (AMAb91033) respectively, detected with isotype-specific secondary antibodies.

Some of the major brain neurotransmitter systems are shown in Figure 3. The image demonstrates the GABAergic, glutamatergic and acetylcholine systems, here visu-

alized by Anti-GAD1 (AMAb91076), Anti-VGLUT1 (AMAb91041) and Anti-CHAT (AMAb91129) antibodies respectively. Isotype-specific secondary antibodies were used for detection.

High Specificity and Interspecies Reactivity

PrecisA Monoclonals Neuroscience markers show high specificity and selectivity for their target proteins. In Figure 4, there is an example of the Anti-NET (AMAb91116) monoclonal antibody. This antibody recognizes the noradrenaline transporter (NET, SLC6A2) and can be used to detect both noradrenergic cell bodies and processes in rat, mouse and human nervous system. The Anti-NET antibody AMAb91116 is highly-specific and does not show any cross-reactivity with e.g. dopamine transporter (SLC6A3, DAT).

Figure 4 shows specific staining of noradrenergic cell bodies and fibers in rat locus coeruleus (A), noradrenergic fibers in mouse cerebral cortex (B) and noradrenergic cell bodies and fibers in human locus coeruleus (C). The specificity of the AMAb91116 is further demonstrated on images D and E. These images show a coronal section of rat brain at the level of caudate putamen stained with Anti-NET (AMAb91116) and Anti-DAT (AMAb91125). The caudate putamen is virtually devoid of noradrenaline fibers, which are mostly present in cortex. A dense network of thin dopamine fibers (in magenta) is present in striatum, where single noradrenaline fibers can sometimes be observed (in green).

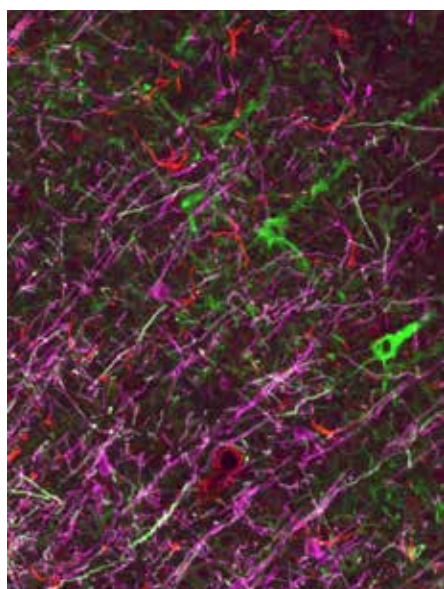


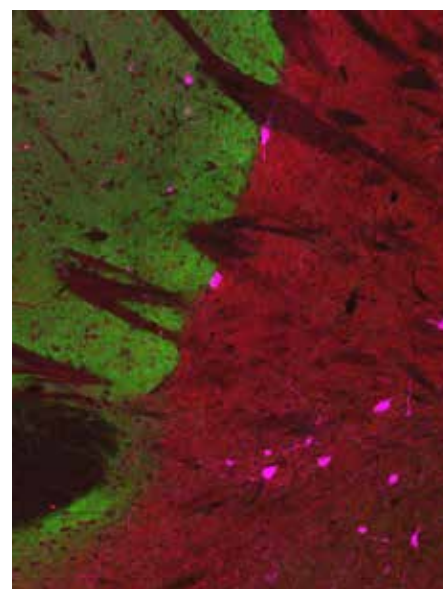
Figure 2.

Multiplexed IHC-IF staining of a coronal section of rat brain visualizing neurons in green, oligodendrocytes in magenta and astrocytes in red. Anti-NEFM antibody of isotype IgG2b (AMAb91030) is used to show neurons and their processes, oligodendrocytes are detected by Anti-CNP antibody of isotype IgG2a (AMAb91068) and astrocytes by Anti-GFAP antibody of isotype IgG1 (AMAb91033).



Figure 3.

Multiplexed IHC-IF staining of mouse caudate putamen/globus pallidus section showing the GABAergic system in red, glutamatergic system in green and acetylcholine system in magenta. Anti-GAD1 antibody of isotype IgG2a (AMAb91076) is used as marker for the GABAergic system, Anti-VGLUT1 antibody of isotype IgG2b (AMAb91041) for the glutamatergic system and Anti-CHAT antibody of isotype IgG1 (AMAb91129) is used to visualize the acetylcholine system.



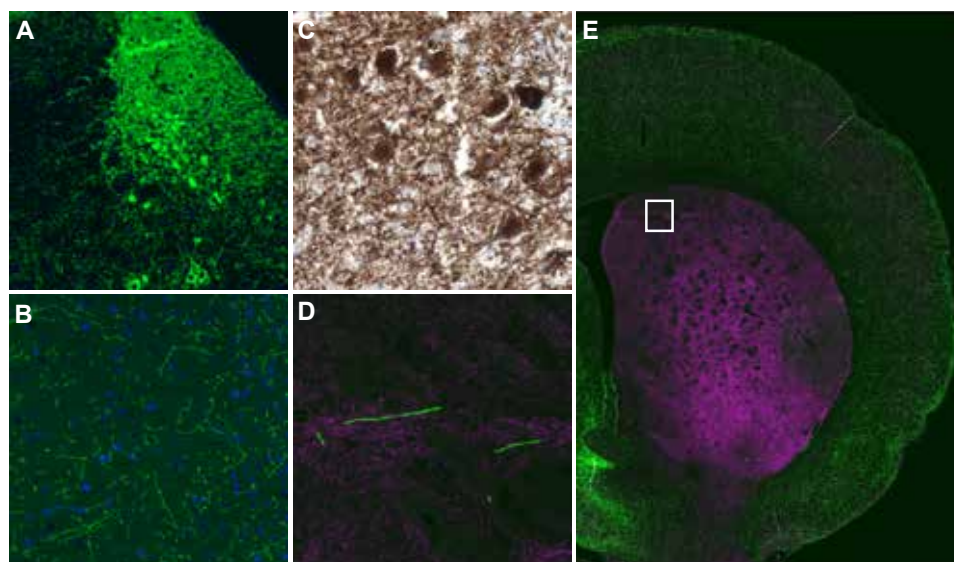


Figure 4.

IHC-IF (A, B, D, E) and bright-field IHC (C) staining demonstrating specificity and selectivity of Anti-NET antibody (AMAb91116) in rat (A, D, E), mouse (B) and human (C) brain. Staining with Anti-NET (AMAb91116) is shown in green (A, B, D, E) and in brown (C). DAT immunoreactivity is visualized in magenta using Anti-DAT antibody (AMAb91125).

Table 1.

Summary of the Precisa Monoclonals Neuroscience Markers.

Marker for	Product Name	Product Number	Validated Applications	Epitope	Sequence identity mouse/rat	Isotype
Neurons	Anti-NEFM (NF160)	AMAb91027	IHC*, WB*	SDHLEEDIHRLKERF	98/98%	IgG1 K
Neurons	Anti-NEFM (NF160)	AMAb91028	IHC*, WB*	LKERFEEEEARLRDDT	98/98%	IgG1 K
Neurons	Anti-NEFM (NF160)	AMAb91029	IHC*, WB*	SDHLEEDIHRLKERF	98/98%	IgG2a K
Neurons	Anti-NEFM (NF160)	AMAb91030	IHC*, WB*	SDHLEEDIHRLKERF	98/98%	IgG2b K
Neurons	Anti-NEFH (NF200)	AMAb91025	IHC, WB	ECRIGFGPIPFSLPE	88/94%	IgG1 K
Neurons	Anti-UCHL1 (PGP9.5)	AMAb91145	IHC*, WB*	AVANNQDKLG	97/97%	IgG1
Astrocytes	Anti-GFAP	AMAb91033	IHC*, WB*	PVQTFNSNLQIRETSL	98/100%	IgG1 K
Astrocytes	Anti-S100B	AMAb91038	IHC*, WB	N.D.	99/98%	IgG1 K
Astrocytes	Anti-GLUL	AMAb91101	IHC*, WB*	LCEVFKYNRR	95/92%	IgG1
Astrocytes	Anti-GLUL	AMAb91102	IHC*, WB*	AMFRDPFRKD	95/92%	IgG1
Astrocytes	Anti-GLUL	AMAb91103	IHC*, WB*	YLVPAAMFRDPFRKD	95/92%	IgG2a K
Schwann cells, oligodendrocytes	Anti-MBP	AMAb91062	IHC*, WB*	RTPPPSQGKG	97/97%	IgG2a K
Schwann cells, oligodendrocytes	Anti-MBP	AMAb91063	IHC*, WB*	N.D.	97/97%	IgG1
Schwann cells, oligodendrocytes	Anti-MBP	AMAb91064	IHC*, WB*	RTPPPSQGKG	97/97%	IgG1
Oligodendrocytes	Anti-MOG	AMAb91066	IHC*, WB	FSRVVHLRYNGKDQD	91/89%	IgG1
Oligodendrocytes	Anti-MOG	AMAb91067	IHC*, WB	GMEVGWYRPP	91/89%	IgG1
Oligodendrocytes	Anti-CNP	AMAb91068	IHC*, WB*	PGVLHCTTKFCDYGK	76/77%	IgG2a K
Oligodendrocytes	Anti-CNP	AMAb91069	IHC*, WB*	N.D.	76/77%	IgG1
Oligodendrocytes	Anti-CNP	AMAb91072	IHC*, WB*	LSEQQLQLWPSDVK	76/77%	IgG2b K
Acetylcholine neurons	Anti-CHAT	AMAb91130	IHC*	GLFSSYRLPGHTQDT	96/96%	IgG2b
Acetylcholine neurons	Anti-CHAT	AMAb91129	IHC*	GLFSSYRLPGHTQDT	96/96%	IgG1
Glutamate neurons	Anti-SLC17A7 (VGLUT1)	AMAb91041	IHC*, WB	EERKYIEDAI	94/94%	IgG2b K
Glutamate neurons	Anti-SLC17A6 (VGLUT2)	AMAb91081	IHC*	EETGDITQNYINYGT	85/85%	IgG1
Glutamate neurons	Anti-SLC17A6 (VGLUT2)	AMAb91086	IHC*	NGGWPSGWEK	85/85%	IgG1
GABA neurons	Anti-SLC32A1 (VGAT)	AMAb91043	IHC*	N.D.	95/93%	IgG1 λ
GABA neurons	Anti-GAD1 (GAD67)	AMAb91076	IHC*, WB	TETDFSNLFA	94/94%	IgG2a K
GABA neurons	Anti-GAD1 (GAD67)	AMAb91078	IHC*, WB	TETDFSNLFA	94/94%	IgG1
GABA neurons	Anti-GAD1 (GAD67)	AMAb91079	IHC*, WB*	TETDFSNLFA	94/94%	IgG2b K
GABA neurons	Anti-GAD2 (GAD65)	AMAb91048	IHC*, WB*	AACACDQKPC	84/88%	IgG1 K
Dopamine neurons	Anti-SLC6A3 (DAT)	AMAb91125	IHC*	ELPWIHCNNSWNSPN	85/85%	IgG1
Dopamine neurons	Anti-DDC	AMAb91089	IHC*, WB	MDWLGMLEL	90/88%	IgG1
Noradrenaline neurons	Anti-SLC6A2 (NET)	AMAb91116	IHC*	HTKYSKYKFTPAEF	N.D.	IgG1
Dopamine and noradrenaline	Anti-TH	AMAb91112	IHC*	N.D.	88/88%	IgG1
Serotonin neurons	Anti-TPH2	AMAb91108	IHC*	N.D.	100/100%	IgG1

Cover image:

Multiplexed IHC-IF staining of a sagittal mouse brain section showing the GABAergic system in red, glutamatergic system in green and acetylcholine system in magenta. The Anti-GAD1 antibody AMAb91076 is used to visualize the GABAergic system, Anti-VGLUT1 antibody AMAb9104 for the glutamatergic system and Anti-CHAT antibody AMAb91129 is for the acetylcholine system with a help of isotype-specific secondary antibodies.

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