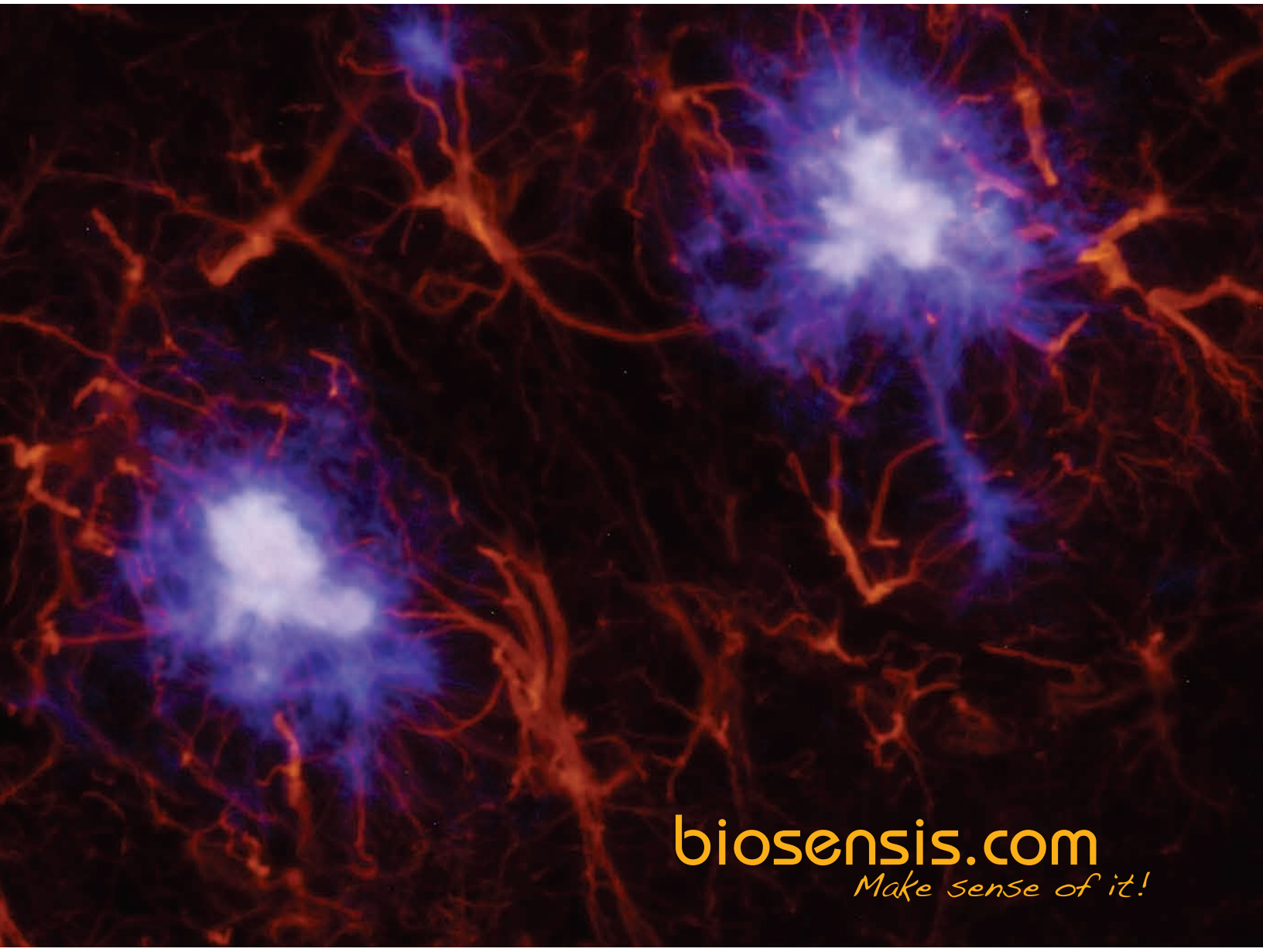
ANTIBODIES, KITS AND REAGENTS FOR NEUROLOGICAL DISEASE Research



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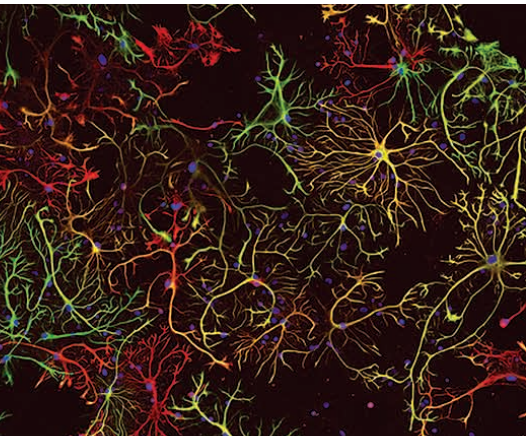

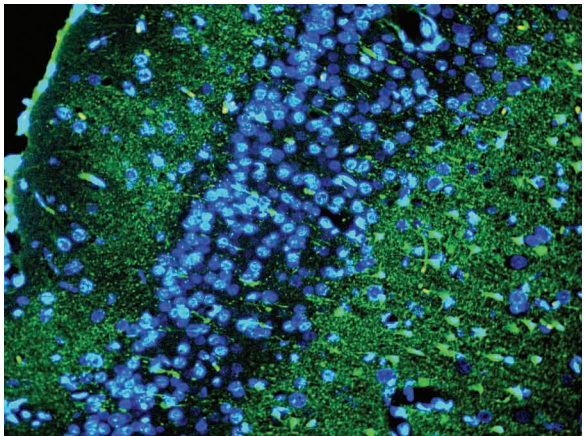

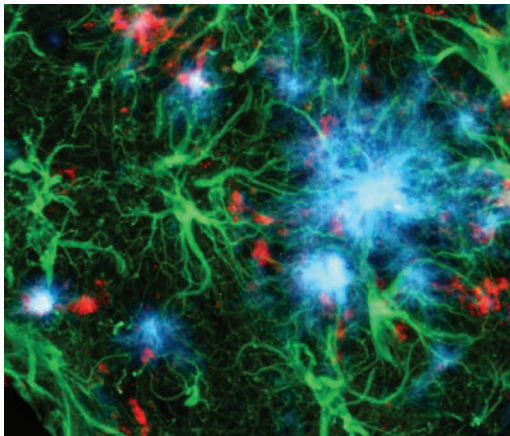

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Make sense of it!

Antibodies, Kits and Reagents for NEUROLOGICAL DISEASE *Research*

Antibodies for Alzheimer's/Parkinson's

3 β Amyloid
4 Autophagy Proteins
6 Neurofilaments
7 Nicastrin and Presenilin
8 Parkin, Siah-1 and DJ-1
9 Synphilin-1
9 α-, β- and γ- Synuclein
11 Tubulin and Tau
12 Ubiquitin and Ubiquitin C Terminal Hydrolase 1

Antibodies for Amyotrophic Lateral Sclerosis

13 Nerve Growth Factor Receptor p75NTR
14 GDNF and VEGF
15 Superoxide Dismutase & Peroxidase Enzymes
15 TDP-43

Antibodies for Pain Research

16 Capsaicin Receptor/TRPV1
16 Additional Neurological Disease Antibodies

ELISA Kits

17 Neurological Disease
20 Additional kits for Neurological Disease
21 Growth Factors

Tracing Reagents

22 Black-Gold® II
23 Fluoro-Jade C®
24 Amylo-Glo®

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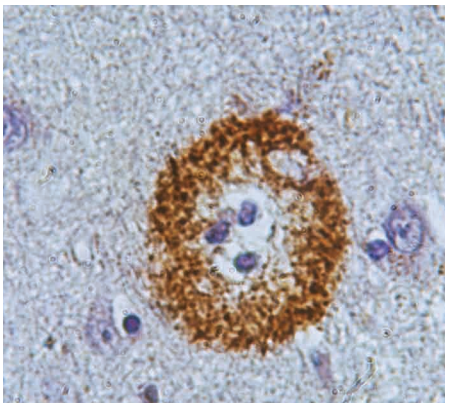
Cover Image 1: Combined GFAP Immunofluorescent staining (red) of activated astrocytes can be seen surrounding Amylo-Glo labeled plaques (blue) in the CA1 region of the hippocampus; combined UV and green light excitation. Cat# TR-300-AG.

Cover Image 2: A view of neonatal rat brain cultures stained with Chicken polyclonal antibody to Vimentin Cat# C-1409-50 (red) and with Rabbit polyclonal antibody to GFAP Cat# R-1374-50 (green). These two proteins are found only in non-neuronal cells so you can't see any neurons, except for their nuclei in blue. Maturish astrocytes have only GFAP so appear green or have a mix of both proteins, so appear yellow. Some cells only have the vimentin (immature astrocytes, microglia and fibroblasts) and so appear red.

Cover Image 3: Double exposure using combined blue and ultraviolet epi-fluorescent illumination of the superficial layers of the cingulated rat cortex exposed to kainic acid stained with Fluoro Jade® Cat# TR-100-FJ.

Cover Image 4: This triple exposure allows for the simultaneous localization of Amylo-Glo positive amyloid plaques (blue), GFAP positive hypertrophied astrocytes (green) and activated microglia (red) in the hippocampus of the AD/Tg mouse. Combined UV, blue and green light illumination. Cat# TR-300-AG.

MOAB-2 Cat# M-1586-100 staining of senile plaque in Alzheimer's diseased hippocampus.



MOAB-2 Monoclonal Antibody

MOAB-2 Cat# M-1586-100 is a pan-specific, high-titer monoclonal antibody which is highly specific for Aβ as demonstrated by biochemical and immunohistochemical (IHC) data.

See page 3 for more information.

Just Arrived: New ELISA for Apolipoprotein ApoE/Aβ complexes

See page 17 for more information.

Exclusive to Biosensis!

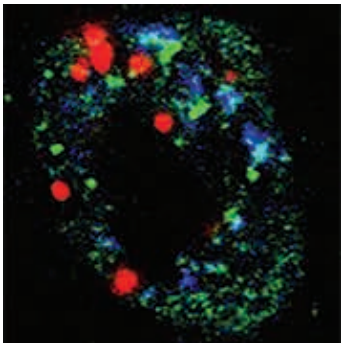
New Aβ Monoclonal Antibody MOAB-2

β Amyloid

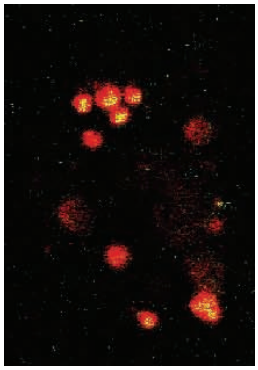
The presence of aggregated amyloid-β peptides (Aβ) is one of the hallmarks of Alzheimer's Disease (AD). However, the form(s) of Aβ-peptides that are associated with this pathology remains unclear. In particular, the neurotoxicity of intraneuronal Aβ accumulation is an area of considerable research and controversy principally because antibodies thought to be specific for Aβ have been shown to actually detect intraneuronal amyloid precursor protein (APP) and not Aβ exclusively.

MOAB-2 is a pan-specific, high-titer antibody to Aβ residues 1-4 as demonstrated by biochemical and immunohistochemical analysis, and is highly specific just to amyloid beta peptide. MOAB-2 does not detect APP or APP-CTFs in cell culture media / lysates or in brain homogenates from transgenic mice.

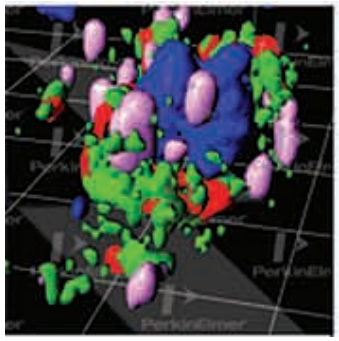
	Target	Purity	Host	Reactivity	Applications	Clone	Code
NEW	**β Amyloid**	Purified	Ms	Hu, Rat	WB, IHC, IH(P), IP, IF, ELISA	MOAB-2	**M-1586-100**
	β Amyloid	IgG	Ms	Hu	IHC	AP-5	**M-1230-100**
	β Amyloid	Whole serum	Rb	Rb	ELISA		**R-959-100**
	APP	Whole serum	Rb	Rat	IHC		**R-070-100**
	APP	Whole serum	Rb	Rat	IHC		**R-071-100**



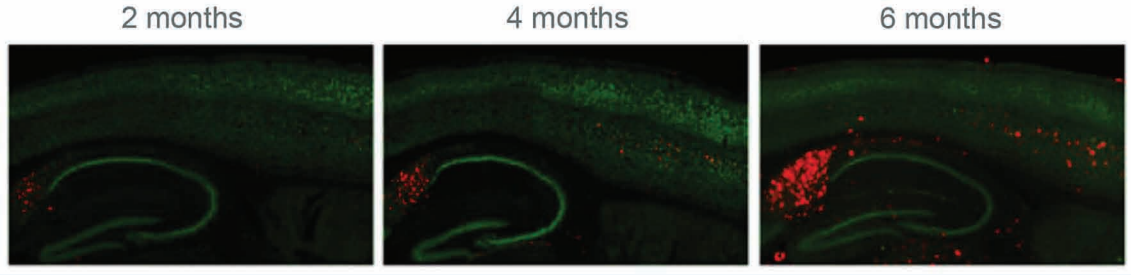
MOAB-2 does not co-localize with intra-neuronal APPc or APP fragments. Red = MOAB-2; Green = N-terminal APP; Blue = C-terminal APP.



MOAB-2 co-localization with intraneuronal Aβ42. Red = MOAB-2; Green = Aβ42 mAb; Yellow = co-localization.



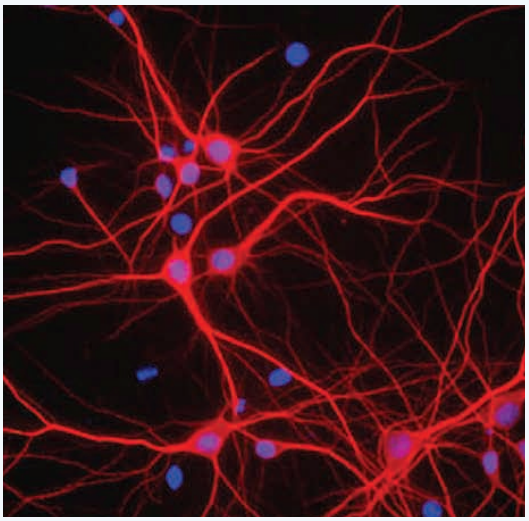
3D reconstruction of intraneuronal Aβ and APP around nucleus. Pink = MOAB-2; Green = N-terminal APP; Red = C-terminal APP; Blue = nucleus (DAPI).

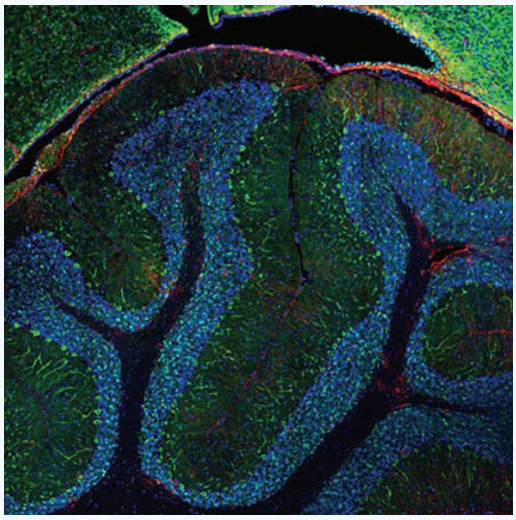


IHC staining of **MOAB-2 Cat# M-1586-100** on 2,4 and 6 month old 5XFAD mouse hippocampal sections showing increasing Aβ staining with MOAB-2 (Red); NeuN staining (Green). Photo courtesy of Dr. Mary Jo LaDu and Dr. Leon Tai from the University of Illinois Chicago, Chicago, IL.

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Antibodies for Alzheimer's/Parkinson's - Autophagy Proteins





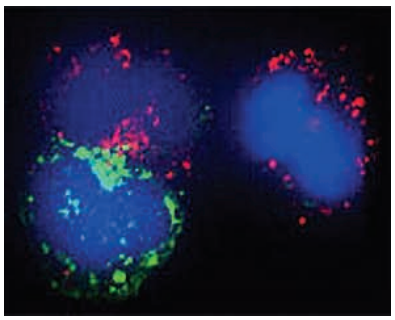
Left image: View of mixed neuron/ glial cultures stained with Chicken polyclonal antibody to Microtubule Associated Protein 2 (MAP2) **Cat# C-1382-50** (red).

Right image: View of a thin section of adult rat cerebellum stained with Chicken polyclonal antibody to Microtubule Associated Protein 2 (MAP2) **Cat# C-1382-50** (green), Rabbit polyclonal to GFAP **Cat# R-1374-50** (red) and DNA (blue). The image shows the molecular layer (outside of lobe) and granular layer; blue since it's full of small neurons and the white matter in the middle.

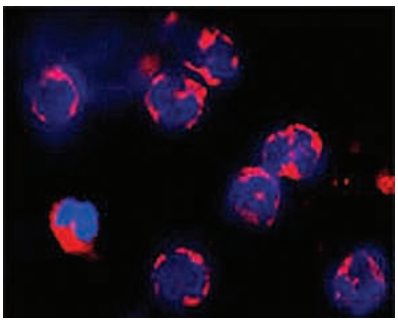
Autophagy

Autophagy is an intracellular process important for the removal of damaged or misfolded proteins or organelles. In addition to the ubiquitin-proteasome system, autophagy is an essential component for protein degradation and maintaining homeostasis in neurons. Inappropriate autophagic activity has been shown to be implicated in a number of neurodegenerative diseases including Alzheimer's and Parkinson's.

Execution of autophagic functions requires an array of interacting proteins that regulate different steps of the autophagy process from induction, target recognition, vesicle traffic, lysosome fusion and degradation in the autophagosome. Beclin-1 plays a central role in autophagy and is required for the induction of autophagosome formation. Microtubule-associated proteins (MAP) such as the γ-aminobutyric acid type A (GABAA) receptor-associated protein GABARAP or MAP light chain 3 (LC3) belong to a family of proteins implicated in intracellular transport that are associated with autophagosome biogenesis. Other autophagy-related (ATG) proteins such as ATG4, ATG5 and ATG16 are also involved in the regulation of autophagy pathways at different maturation stages.



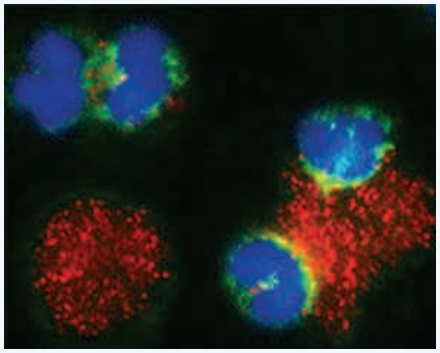
Confocal microscopy on immunofluorescently detected Beclin-1 in cytospin-isolated human cells using Rabbit antibody to Beclin-1: whole serum **Cat#** (**R-141-100**) at a dilution of 1: 200, incubated for 1 hr at room temperature.



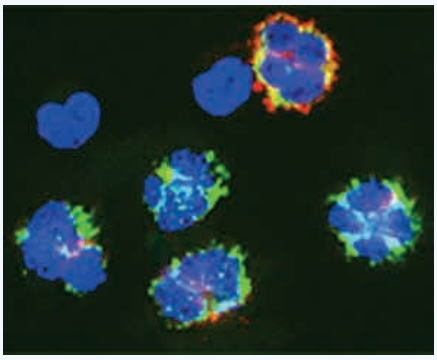
Confocal microscopy on immunofluorescently detected ATG3 in cytospin-isolated human cells using Rabbit antibody to ATG3: whole serum **Cat#** (**R-159-100**) at a dilution of 1: 100, incubated for 1 hr at room temperature.

Antibodies for Alzheimer's/Parkinson's - Autophagy Proteins

Target	Purity	Host	Reactivity	Applications	Clone	Code
ATG3	IgG	Ms	Hu	WB, ELISA	1F7	**M-908-100**
ATG3	Whole serum	Rb	Hu, Rat, Ms	WB, IHC, IF		**R-159-100**
ATG4B	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-157-100**
ATG4C	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-156-100**
ATG5	IgG	Ms	Hu	WB, ELISA	3D2	**M-881-100**
ATG5	IgG	Ms	Hu	WB, ELISA	4B2	**M-882-100**
ATG5	IgG	Rb	Hu	WB, IHC, IF		**R-138-500**
ATG5	Whole serum	Rb	Hu	WB, IHC, IF		**R-111-100**
ATG7	Whole serum	Rb	Hu, Rat	IHC, IF		**R-161-100**
ATG9A	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-160-100**
ATG10	Whole serum	Rb	Hu	IHC, IF		**R-145-100**
ATG12	IgG	Ms	Hu	WB, ELISA	2H8	**M-879-100**
ATG12	IgG	Rb	Hu, Rat	WB, IHC, IF		**R-137-500**
ATG12	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-112-100**
ATG16	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-158-100**
Beclin-1	Whole serum	Rb	Hu	IHC		**R-141-100**
GABARAP	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-142-100**
GABARAP	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-143-100**
MAP1LC3 A	Whole serum	Rb	Hu, Rat	WB, IHC, IC		**R-146-100**
MAP1LC3 B	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-155-100**
MAP1LC3 C	Whole serum	Rb	Hu	WB, IHC, IF		**R-140-100**
MAP2	IgG	Ms	Hu, Rat, Ms	WB, IHC	MP-2	**M-1031-100**
MAP2	IgG	Ms	Hu, Rat, Ms	WB, IHC	5H11	**M-1625-100**
MAP2	Purified	Ch	Hu, Rat, Ms, Bov	IC		**C-1382-50**
Parkin (305-325aa)	Whole serum	Rb	Rat, Gp	WB, IHC, ELISA		**R-113-100**
Parkin (295-311aa)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-114-100**



Confocal microscopy on immunofluorescent detection of MAP1LC3 A in cytospin-isolated human cells using Rabbit antibody to MAP1LC3 A: whole serum **Cat#** (**R-146-100**) at a dilution of 1: 200, incubated for 1 hr at room temperature.



Confocal microscopy on immunofluorescent detection of APG7 in cytospin-isolated human cells using Rabbit antibody to ATG7: whole serum **Cat#** (**R-161-100**) at a dilution of 1: 100, incubated for 1 hr at room temperature.

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Antibodies for Alzheimer's/Parkinson's - Neurofilaments

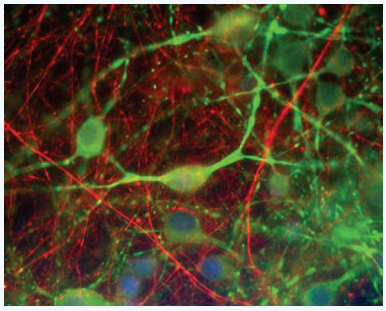
Target	Purity	Host	Reactivity	Applications	Clone	Code
α Internexin	Purified	Ch	Hu, Rat, Ms, Feline	WB, IC		**C-1377-50**
α Internexin	Whole serum	Rb	Hu, Rat, Ms, Feline	WB, IC		**R-1379-50**
α Internexin	Purified	Ms	Hu, Rat, Ms, Feline	WB, IHC, IC	1D2	**M-1378-250**
Neurofilament L	Whole serum	Rb	Hu, Rat, Ms, Feline, Ch	WB, IC		**R-1392-50**
Neurofilament L	Purified	Ch	Hu, Rat, Ms, Feline, Ch	WB, IC		**C-1390-50**
Neurofilament L	Purified	Ms	Hu, Rat, Ms, Feline, Bov, Ch	WB, IHC, IC	DA2	**M-1391-50**
Neurofilament L	IgG	Ms	Hu, Pig	WB, IHC	NF-68	**M-987-100**
Neurofilament M	Purified	Ch	Hu, Rat, Ms, Feline, Ch	WB, IC		**C-1393-50**
Neurofilament M	Whole serum	Rb	Hu, Rat, Ms, Feline, Ch	WB, IC		**R-1395-50**
Neurofilament M	Purified	Ms	Hu, Rat, Ms, Feline, Bov, Ch	WB, IHC, IC	3H11	**M-1394-100**
Neurofilament H	IgG	Ms	Hu, Rat, Ms	WB, IHC	NF-200	**M-988-100**
Neurofilament H	IgG	Ms	Hu	WB, ELISA	2E8	**M-848-100**
Neurofilament H	Whole serum	Rb	Rat	WB, IC		**R-1389-50**
Neurofilament H	Purified	Ch	Hu, Rat, Ms, Feline, Ch	WB, IC, ELISA		**C-1386-50**
Neurofilament H, phospho	Whole serum	Rb	Rat	WB, IC, ELISA		**R-1388-50**
Neurofilament H, phospho	Purified	Ms	Rat, Ch	WB, IC	NAP4	**M-1387-50**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

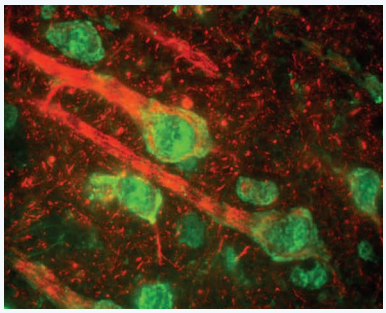
Neurofilaments

Neurofilaments (NF) are the major constituent of the neuronal cytoskeleton. They are composed of a mixture of subunits which principally include the neurofilament triplet proteins NF-L (light), NF-M (medium) and NF-H (heavy). Neurofilaments may also include peripherin, α-internexin, nestin and in some cases vimentin.

A role of neurofilaments in a variety of neurodegenerative diseases has been increasingly appreciated in recent years. The aggregation and hyper-phosphorylation of NFs, for instance, has been associated with the progression of some forms of multiple sclerosis and amyotrophic lateral sclerosis. Neurofilaments are incorporated in the structure of intracellular Lewis bodies which are a histopathological hallmark of Parkinson's Disease.



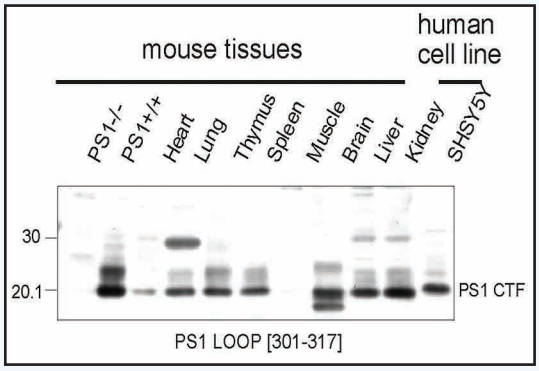
Mixed cultures of rat CNS cells stained with Mouse monoclonal antibody to α Internexin [1D2] **Cat# M-1378-250** (red) and Chicken polyclonal antibody to Microtubule associated protein 2 **Cat# C-1382-50** (green).



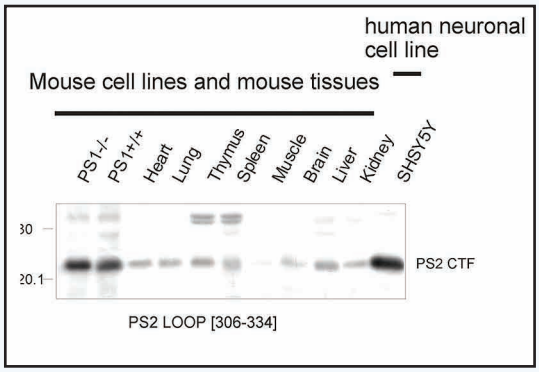
Section of rat cerebral cortex stained with Rabbit polyclonal antibody to Neurofilament Medium **Cat# R-1395-50** (red).

Nicastrin and Presenilin

The production of amyloid-β peptides (Aβ) is a key event in Alzheimer's Disease (AD). The γ-secretase complex enzymatically produces Aβ-peptides by cleaving amyloid precursor protein (APP).
The γ-secretase complex is composed of four membrane proteins including the catalytic subunit presenilin 1 or 2 and nicastrin. Presenilin and nicastrin are both involved in APP processing and Aβ-peptide generation and may thus play a role in the formation of amyloid plaque. Defects in presenilin function are a well-documented cause for early-onset familial and autosomal dominant forms of AD pathology.



Cat# R-1680-500 Western Immunoblotting of mouse and human Presenilin 1 protein in mouse cell line extracts, various mouse tissues and a human cell line. Membrane proteins were prepared and loaded as 20 µg protein per lane. Anti-PS1 loop antibody used at 1:1000.

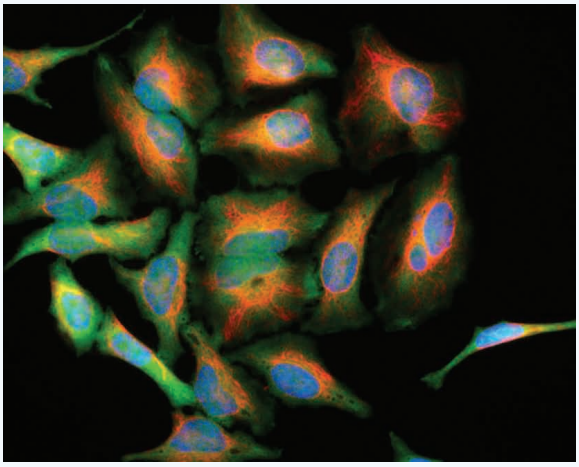


Cat# R-1681-500 Western Immunoblotting of mouse and human Presenilin 2 protein in mouse cell line extracts, various mouse tissues and a human cell line. Membrane proteins were prepared and loaded as 20 µg protein per lane. Anti-PS2 loop antibody used at 1:1000.

	Target	Purity	Host	Reactivity	Applications	Code
NEW	**Nicastrin, C-term**	IgG	Rb	Hu, Rat, Ms, Gp	WB, IP	**R-1684-500**
NEW	**Nicastrin, Central**	IgG	Rb	Hu, Rat, Ms, Gp	WB, IP	**R-1685-500**
NEW	**Nicastrin, N-term**	IgG	Rb	Hu, Rat, Ms, Gp	WB, IP	**R-1686-500**
	Presenilin 1	Purified	Ch	Hu, Rat, Ms	WB, ELISA	**C-1534-500**
NEW	**Presenilin 1, N-term**	IgG	Rb	Hu, Rat, Ms, Gp	WB, IF	**R-1605-500**
NEW	**Presenilin 1 loop**	IgG	Rb	Hu, Rat, Ms, Gp	WB	**R-1680-500**
	Presenilin 2	Purified	Ch	Hu, Rat, Ms	WB, ELISA	**C-1535-500**
	Presenilin 2	Affinity purified	Rb	Hu, Rat	WB, IHC	**R-1479-100**
NEW	**Presenilin 2 loop**	IgG	Rb	Hu, Rat, Ms, Gp	WB, IP	**R-1681-500**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Antibodies for Alzheimer's/Parkinson's - Parkin, Siah-1 and DJ-1



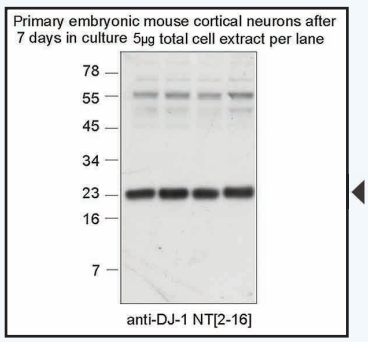
HeLa cells stained with Mouse monoclonal antibody to DJ-1 **Cat# M-1573-100** (green), and Chicken polyclonal antibody to Vimentin **Cat# C-1409-50** (red) and DNA (blue). **Cat# M-1573-100** antibody reveals strong cytoplasmic staining for DJ-1.

Parkin, Siah-1 and DJ-1

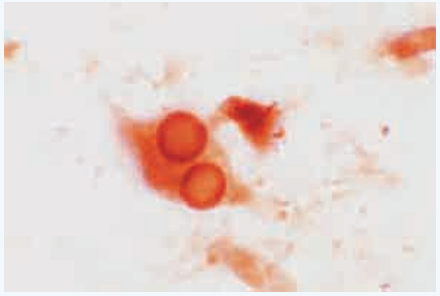
Parkinson's Disease (PD) is characterized by the death of dopaminergic neurons in the substantia nigra. Oxidative stress is one of the mechanisms thought to be responsible for neurodegeneration. DJ-1 is a redox-sensitive multi-functional protein involved in transcriptional regulation, anti-oxidative stress activity and mitochondrial regulation. Siah-1, a member of the seven in absentia homolog (SIAH) family and parkin are E3 ubiquitin ligases catalyzing the covalent attachment of ubiquitin moieties onto substrate proteins. The normal functions of these ligases involve ubiquitination and removal of misfolded or damaged proteins and degradation of dysfunctional depolarized mitochondria. Besides their suggested individual neuroprotective roles, Parkin has been shown to modulate DJ-1 transcription and protein levels. Mutations in the parkin and DJ-1 genes as well as malfunction of both proteins have been associated with PD pathogenesis.

	Target	Purity	Host	Reactivity	Applications	Clone	Code
	DJ-1	IgG	Ms	Hu, Ms, Bov	WB, IHC, IF	PARK7	**M-1573-100**
NEW	**DJ-1, N-term**	IgG	Rb	Hu, Ms	WB, IHC		**R-1682-500**
	Parkin (305-325aa)	Whole serum	Rb	Rat, Gp	WB, IHC, ELISA		**R-113-100**
	Parkin (295-311aa)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-114-100**
	Siah-1	IgG	Ms	Hu	WB, IHC, IF, ELISA	2F2	**M-867-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)



Cat# R-1682-500 Western blotting for DJ-1 in extracts of primary cultured neurons. Samples resolved on 10% Tris-tricine gels and transferred to nitrocellulose membrane for blotting.



Immunohistochemical staining of synphilin-1 positive Lewy bodies in dorsal raphe nucleus in a case of Parkinson's disease using rabbit polyclonal antibody to human synphilin-1, **Cat# R-116-100**.

Synphilin-1

Synphilin-1 has been identified as a protein interacting with α-synuclein in neurons. It plays an important role in the formation of protein aggregates and cytotoxicity in Parkinson's Disease (PD). This neuropathology is characterized by the loss of dopaminergic neurons and cytoplasmic inclusions (Lewy bodies) that contain α-synuclein and ubiquitylated synphilin-1. Synphilin-1 is a substrate protein of the ubiquitin ligases parkin and Siah-1. Ubiquitylation of synphilin-1 by Siah-1 is essential for its aggregation into inclusions. Moreover, it has been shown that mutations in parkin disrupt the ubiquitylation of synphilin-1 and the formation of the ubiquitin-positive inclusions.

Target	Purity	Host	Reactivity	Applications	Code
Synphilin-1α	Whole serum	Rb	Hu, Rat	IHC	**R-116-100**
Synphilin-1 (911-919aa)	Whole serum	Rb	Hu, Rat	IHC, WB	**R-117-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Synuclein

The family of synuclein proteins is comprised of α-, β- and γ-synuclein. These small proteins are widely expressed throughout the central nervous system and are especially abundant in neurons. The protein α-synuclein is the best-characterized family member and exists as soluble and membrane-bound monomer that can form filamentous aggregates. Abnormal α-synuclein aggregation has been associated with several neurodegenerative diseases commonly denoted as synucleinopathies. The protein α-synuclein is a major component of amyloid plaques that are observed in brains of patients with Alzheimer's Disease (AD) and Lewy bodies found in Parkinson's Disease (PD).

While α-synuclein aggregates appear to be neurotoxic, β-synuclein is suggested to be neuroprotective due to its ability to reduce α-synuclein aggregation. Nevertheless, recent data shows that mutated β-synuclein might also form fibrillar aggregates and induce neurotoxicity. In contrast, γ-synuclein appears to have a low aggregation and non-toxic propensity, despite its abundant expression in the substantia nigra, a brain region most seriously affected by neurodegeneration in PD.

Antibodies for Alzheimer's/Parkinson's - Synuclein (Continued)

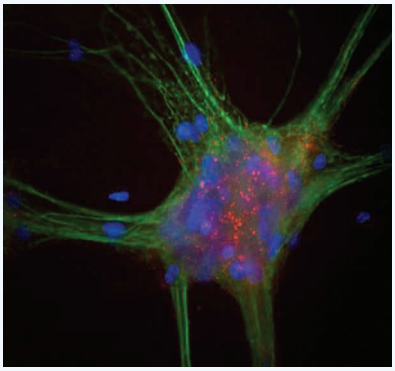
Antibodies

	Target	Purity	Host	Reactivity	Applications	Clone	Code
	α Synuclein	Purified	Ms	Hu, Rat, Ms	WB, IC	3H9	**M-1402-100**
	α Synuclein (129-140aa)	Whole serum	Rb	Hu, Rat, Ms	WB, IHC		**R-075-100**
	α Synuclein (116-131aa)	Whole serum	Sh	Hu, Rat, Ms	IHC		**S-024-100**
	α Synuclein (116-131aa)	Affinity purified	Sh	Hu, Rat, Ms	WB, IHC, ELISA		**S-075-50**
	α Synuclein (108-120aa)	Affinity purified	Sh	Hu, Rat	IHC		**S-078-50**
	β Synuclein (108-125aa)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-056-100**
NEW	**β Synuclein** (C-term)	IgG	Rb	Hu, Ms	WB, IHC		**R-1683-500**
	β Synuclein (108-125aa)	Whole serum	Sh	Hu, Rat	IHC		**S-041-100**
	β Synuclein (108-125aa)	Affinity purified	Sh	Hu, Rat	IHC		**S-077-100**
	γ Synuclein (114-127aa)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-058-100**
	γ Synuclein (114-127aa)	Affinity purified	Sh	Hu, Rat	WB, IHC		**S-069-20**
	Synuclein (pan specific)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-060-100**
	Synuclein (pan specific)	Affinity purified	Sh	Hu, Rat	WB, IHC		**S-044-100**

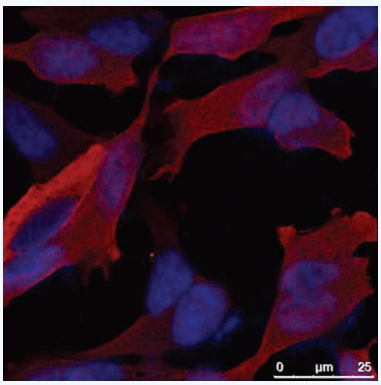
Peptides

Protein	Source	Code
Parkin control peptide (305-323aa) **for R-113-100**	Synthetic peptide	**PE-1253-100**
α-synuclein control peptide (116-131aa) **for S-024-100 & S-075-50**	Synthetic peptide	**PE-1606-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

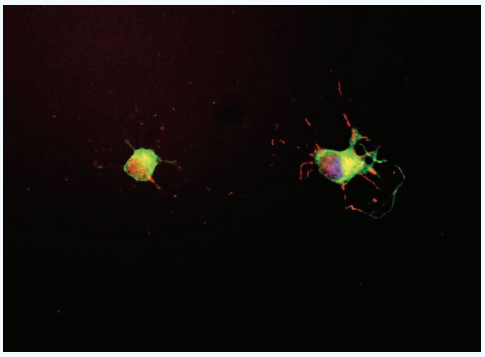


Mixed neuron-glial cultures stained with Mouse monoclonal antibody to α Synuclein [3H9] **Cat# M-1402-100** (red) and Chicken polyclonal antibody to MAP2 **Cat# C-1382-50** (green). The α Synuclein antibody stains vesicular structures of the perikarya and processes of the neurons in this image.



Immunofluorescence staining of α synuclein in cultured cells using Sheep antibody to α synuclein, **Cat# S-078-50** and fluorescent-labelled secondary antibody. Image courtesy of Dr Wei-Ping Gai, Flinders University of South Australia.

Antibodies for Alzheimer's/Parkinson's - Tubulin and Tau



E18 hippocampal neurons were grown for seven days. The neurons were fixed and immunostained with **Cat# M-1703-100** (red channel). The cells were also stained in green with **Cat# C-1377-50**, our chicken antibody to alpha Internexin and DNA (blue). **Cat# M-1703-100** stains the neuronal perikarya and process strongly, and does not stain non neuronal cells in these cultures. The alpha internexin antibody stains intermediate or 10nm filament bundles in the cytoplasm of these cells.

	Target	Purity	Host	Reactivity	Applications	Clone	Code
	Tau	IgG	Ms	Hu, Rat, Ms	WB, IHC	TAU-93	**M-960-100**
NEW	**Tau**	Purified	Ms	Hu, Rat, Ms	WB, ICC		**M-1703-100**
	Tau (rHuTau)	Whole serum	Rb	Hu, Pig	WB, ELISA		**R-184-100**
	Tau (240-450aa)	IgG	Rb	Hu, Rat, Ms	WB, IHC		**R-177-250**
	α Tubulin	IgG	Ms	Hu, Rat	WB, IHC	Tub-1	**M-1192-100**
	β Tubulin	IgG	Ms	Hu, Rat	WB, IHC	Tub-2	**M-1191-100**
	γ Tubulin	IgG	Ms	Hu, Rat	WB	IMD-20	**M-1193-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Tubulin and Tau

The tubulin family includes five distinct tubulins: α-, β-, γ-, δ- and ε-tubulin. Microtubules consist principally of α- and β-tubulin and are involved in maintaining the cytoskeleton network as well as several basic cellular functions such as intracellular transport and cell movement. γ-tubulin is required to nucleate polymerization of tubulin subunits to form microtubule polymers.

Tau is a microtubule-associated protein expressed in neurons promoting microtubule assembly and stability. In Alzheimer's Disease, the neuronal cytoskeleton in the brain is progressively disrupted and replaced by neurofibrillary tangles mainly composed of hyperphosphorylated forms of Tau. Defects in microtubule-associated protein Tau are a cause of frontotemporal dementia and parkinsonism as well as a number of other neurodegenerative diseases.

Antibodies for Alzheimer's/Parkinson's - Ubiquitin and Ubiquitin C Terminal Hydrolase 1

Ubiquitin

Ubiquitin is a protein that has a central role in regulating protein degradation. It is a protein modifier that can be covalently attached to target lysines either as a monomer or as a polymer. Attachment of ubiquitin polymers to proteins leads to degradation of the protein by the 26S proteasome. Ubiquitin C terminal hydrolase 1 is a thiol protease that recognizes and hydrolyzes a peptide bond at the C-terminal glycine of ubiquitin thereby regulating ubiquitin detachment and recycling. The neuronal ubiquitin/proteasomal pathway is required for normal synaptic and cognitive function and malfunction has been implicated in the pathogenesis of Alzheimer's and other diseases.

Target	Purity	Host	Reactivity	Applications	Clone	Code
SUMO-1	Whole serum	Rb	Hu, Rat	WB, IHC		**R-115-100**
SUMO-1	Whole serum	Sh	Hu, Rat	WB, IHC		**S-064-100**
Ubiquitin	Purified	Ms	Hu, Bov, Ch	WB, IH(P)	Ubi-1	**M-1404-100**
Ubiquitin	Whole serum	Rb	Hu	WB, IHC		**R-1405-50**
Ubiquitin	IgG	Rb	Hu, Rat, Baboon	WB, IHC		**R-182-250**
Ubiquitin C Terminal Hydrolase L1/PGP 9.5	Purified	Ch	Hu, Rat, Ms, Bov	WB, IC		**C-1406-50**
Ubiquitin C Terminal Hydrolase L1/PGP 9.5	Whole serum	Rb	Hu, Rat, Ms, Bov	WB, IC		**R-1408-50**
Ubiquitin C Terminal Hydrolase L1/PGP 9.5	Purified	Ms	Hu, Rat, Bov	WB, IC, IHC	BH7	**M-1407-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

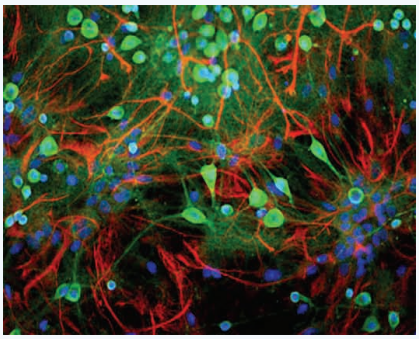


Image shows rat mixed neuron/glial cultures stained with Chicken polyclonal antibody to Ubiquitin C Terminal Hydrolase 1 **Cat# C-1406-50** (green) and Rabbit polyclonal antibody to Glial Fibrillary Acidic Protein **Cat# R-1374-50** (red). Blue is a DNA stain.

Antibodies for Amyotrophic Lateral Sclerosis - Nerve Growth Factor Receptor p75NTR

Antibodies

Target	Purity	Host	Reactivity	Applications	Clone	Code
p75NTR - ATTO	IgG	Ms	Hu, Cat, Dog, Pig, Rb, Sh	IHC, IF, FACS	ME20.4	**M-027-50-AT**
p75NTR - FITC	IgG	Ms	Hu, Cat, Dog, Pig, Rb, Sh	IHC, IF, FACS	ME20.4	**M-017-50-FT**
p75NTR	IgG	Ms	Hu, Cat, Dog, Pig, Rb, Sh	IHC, IF, FACS	ME20.4	**M-011-100**
p75NTR - ATTO	IgG	Ms	Rat	IHC, FACS	MC192	**M-026-50-AT**
p75NTR - FITC	IgG	Ms	Rat	IHC, IF, FACS	MC192	**M-016-50-FT**
p75NTR	IgG	Ms	Rat	WB, IHC, ELISA	MC192	**M-006-100**
p75NTR - ATTO	IgG	Ms	Hu, Ms, Rat	WB, IHC, IF, FACS	MLR2	**M-028-50-AT**
p75NTR - FITC	IgG	Ms	Hu, Ms, Rat	WB, IHC, IF, FACS	MLR2	**M-018-50-FT**
p75NTR	IgG	Ms	Hu, Ms, Rat, Gp	WB, IHC, IF, IP, FACS	MLR2	**M-009-100**
p75NTR	Whole serum	Rb	Rat	IHC, IF		**R-089-100**

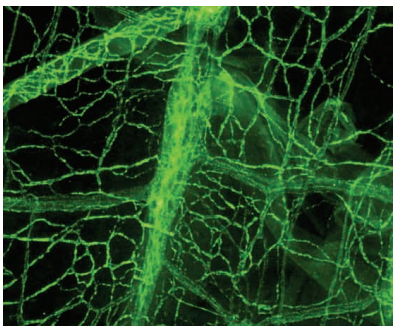
Proteins

	Protein	Source	Code
NEW	**Mouse p75 NGFR-Fc Chimera**	CHO	**PE-1704-25**
	Human p75 NGFR-Fc Chimera (209aa)	HEK293	**PE-1237-15**
	Human p75 NGFR-Fc Chimera (209aa)	HEK293	**PE-1237-25**
	Human p75 NGFR-Fc Chimera (222aa)	HEK293	**PE-1238-25**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Nerve Growth Factor Receptor (p75NTR)

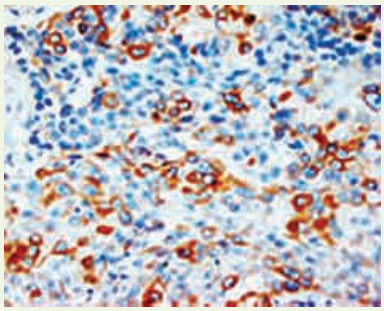
The nerve growth factor (NGF) receptor, also known as p75 neurotrophin receptor (p75NTR), is a low affinity NGF receptor. The other members of the neurotrophin family, including brain-derived neurotrophic factor (BDNF), neurotrophin (NT)-3 and NT-4/5 bind to p75NTR with equal affinity. This receptor also binds pro-neurotrophins. p75NTR mediates signalling of neurotrophins for neuronal survival, apoptosis, neurite outgrowth and synaptic plasticity. Altered neurotrophin levels and p75NTR expression are implicated in degeneration of spinal motor neurons in human and mouse models of amyotrophic lateral sclerosis.



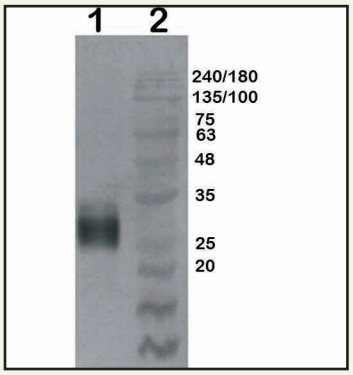
Immunofluoresent staining of adult rat mesenteric nerves following in vivo intraperitoneal administration of labeled MLR2.

NEW: NGFR/p75ECD *Rapid*™ ELISA Kits! **See page 19 for more information.**

Antibodies for Amyotrophic Lateral Sclerosis - GDNF and VEGF



Immunohistochemical staining of paraffin-embedded human esophagus squamous carcinoma sections using VEGF antibody **Cat# (R-1074-100)** at a concentration of 1.0-2.0 µg/ml. Secondary detection using biotinylated goat anti-rabbit IgG (10.0 µg/ml).



Western-Blot detection of human GFRα-4, using Chicken polyclonal antibody to human GFRα-4 **Cat# C-1662-100**. GFRα-4 was expressed by CHO cell culture. 100 ng of purified protein was loaded per lane. Line 1. hGFRα-4. Primary antibody dilution 1:5000 was used. Line 2. Prestained protein ladder (Naxo 8003).

GDNF and VEGF

Glial-derived neurotrophic factor (GDNF) and vascular endothelial growth factor (VEGF) are trophic factors that support the survival of motor neurons. Thus, these factors are implicated in amyotrophic lateral sclerosis (ALS) pathogenesis.

GDNF levels in the cerebrospinal fluid and GDNF mRNA in muscle are increased in ALS patients compared to controls. This implies an important role of GDNF in ALS. Indeed, delivery and over-expression of GDNF and VEGF are neuroprotective and extends life span in animal models suggesting that gene transfer with these trophic factors may be an option for applications in humans.

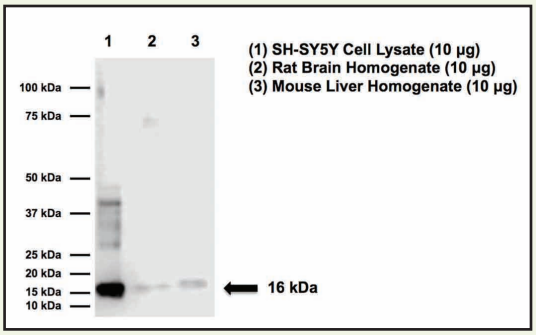
	Target	Purity	Host	Reactivity	Applications	Clone	Code
	GDNF (101-118/199-211)	Purified	Ch	Hu, Rat, Ms	WB, IHC, ELISA		**C-1518-500**
	GDNF (rHuGDNF)	Whole serum	Rb	Hu, Rat, Ms	WB		**R-080-100**
	GDNF (rHuGDNF)	Affinity purified	Sh	Hu, Rat, Ms	WB, IHC		**S-021-50**
	GDNF (rHuGDNF)	Whole serum	Sh	Hu, Rat, Ms	WB		**S-022-100**
	GDNF	Purified	Ms				***Coming soon***
NEW	**GFR α-1**	Affinity purified	Ch	Hu	WB, ICC		**C-1659-100**
NEW	**GFR α-2**	Affinity purified	Ch	Hu	WB, ICC		**C-1660-100**
	GFR α-2	Whole serum	Rb	Rat	WB, IHC		**R-067-100**
	GFR α-3	Whole serum	Rb	Rat	WB, IHC		**R-068-100**
NEW	**GFR α-3**	Purified	Ch	Hu	WB, IF		**C-1661-100**
NEW	**GFR α-4**	Affinity purified	Ch	Hu	WB, IHC		**C-1662-100**
NEW	**Neurturin/NTN** (rHuNTN)	IgG	Ms	Hu	WB	1B11	**M-1670-100**
	Neurturin/NTN (rHuNTN)	Whole serum	Rb	Hu, Rat, Ms	IHC		**R-1561-100**
NEW	**Neurturin/NTN** (rHuNTN)	IgG	Rb	Hu	WB		**R-1669-100**
	Neurturin/NTN (rHuNTN)	Whole serum	Sh	Hu, Rat, Ms	WB, IHC, ELISA		**S-010-100**
	VEGF Receptor 2	IgG	Ms	Hu	WB, IHC	FLK-6	**M-1183-100**
	VEGF A (60-70aa)	Affinity purified	Rb	Hu, Rat, Ms, Rb	WB, IHC		**R-1074-100**
	VEGF D (101-115aa)	Affinity purified	Rb	Hu	WB		**R-1369-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

Antibodies for Amyotrophic Lateral Sclerosis - Superoxide Dismutase & Peroxidase Enzymes / TDP-43

SOD & Peroxidase Enzymes

Radical Scavengers: Superoxide dismutase, glutathione peroxidase and peroxiredoxin are enzymes that play an important role in the regulation of the cellular redox environment. A dysregulated balance of free radicals such as superoxide and hydrogen peroxide can cause oxidative stress which underlies a variety of neurodegenerative diseases. Defects in SOD1, for instance, are the cause of amyotrophic lateral sclerosis type 1 which is a neurodegenerative disorder affecting upper and lower motor neurons and resulting in fatal paralysis.



Cat# R-1708-100 detects SOD1 protein (16 kDa) in SH-SY5Y cell lysates and in rodent samples. Proteins were separated by SDS-PAGE (reduced) and western blotting performed with anti-SOD1 primary (1:1000) and anti-rabbit-HRP conjugate (1:10000) as secondary antibodies. The chemiluminiscent signals were recorded on an image scanner (6 minute scan).

	Target	Purity	Host	Reactivity	Applications	Clone	Code
	GPx-1 (175-194aa)	Whole serum	Rb	Hu, Rat	WB, IHC, ELISA		**R-1588-100**
	GPx-1 (175-194aa)	Whole serum	Sh	Hu, Rat	WB, IHC		**S-072-100**
	GPx-3 (135-154aa)	Whole serum	Rb	Hu, Rat	IHC		**R-171-100**
	GPx-4 (78-93aa)	Whole serum	Rb	Hu, Rat	WB, IHC		**R-1589-100**
	Peroxiredoxin-1	Whole serum	Rb	Hu, Rat	WB, IHC, ELISA		**R-1590-100**
	Peroxiredoxin-2	Whole serum	Rb	Hu, Rat	WB, IHC, ELISA		**R-1591-100**
	Peroxiredoxin-4	Whole serum	Rb	Hu, Rat	WB, IHC, ELISA		**R-1593-100**
	Peroxiredoxin-5	Whole serum	Rb	Hu, Rat	WB, IHC, IF		**R-1595-100**
	Peroxiredoxin-6	Whole serum	Rb	Hu, Rat, Ms	WB, IHC, ELISA		**R-169-100**
	Peroxiredoxin-6	Whole serum	Sh	Hu, Rat, Ms	WB, IHC, ELISA		**S-073-100**
NEW	**SOD1** (rHuSOD1)	IgG	Rb	Hu, Rat, Ms, Pig, Ch	WB		**R-1708-100**
	SOD1 (rHuSOD1)	IgG	Ms	Hu	WB, ELISA	10D5	**M-1604-100**
	SOD1 (Hu 24-36aa)	Whole serum	Rb	Hu	WB		**R-125-100**
	SOD1 (Ms 24-36aa)	Whole serum	Rb	Rat, Ms	WB		**R-126-100**
	SOD1 (121-139aa)	Whole serum	Rb	Hu	WB, IHC		**R-168-100**
	SOD2 (25-43aa)	Whole serum	Rb	Hu, Rat, Ms	WB, IF		**R-1596-100**
	SOD3 (18-37aa)	Whole serum	Rb	Hu	WB, IHC		**R-170-100**

TDP-43

Transactive response DNA-binding protein 43 (TDP43) is a nuclear protein regulating gene transcription and splicing. Mutations in TDP-43 are linked to inherited forms of amyotrophic lateral sclerosis (ALS). Mutated TDP-43 redistributes to the cytoplasm in affected motor neurons and forms neurotoxic aggregates which are the histopathological hallmark of sporadic ALS.

Target	Purity	Host	Reactivity	Applications	Code
TDP-43	Purified	Ms	Hu, Rat, Mouse	WB, IC	**M-1403-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)

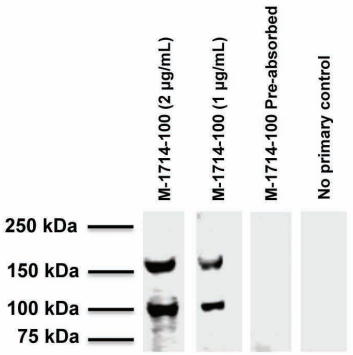
Antibodies for Pain Research - Capsaicin Receptor/TRPV1

	Target	Purity	Host	Reactivity	Applications	Clone	Code
NEW	**Capsaicin Receptor** (819-838aa)	IgG	Ms	Rat, Ms	WB, IF	BS397	**M-1714-100**
	Capsaicin Receptor (531-541aa)	Whole serum	Rb	Rat, Ms	IHC		**R-053-100**
	Capsaicin Receptor (608-621aa)	Whole serum	Rb	Hu, Rat	IHC		**R-076-100**
	Capsaicin Receptor (195-207aa)	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC		**R-1364-100**

Capsaicin Receptor/TRPV1

The transient receptor potential cation channel subfamily V member 1 (TRPV1), also known as the capsaicin receptor, is a non-selective ligand-gated cation channel that responds to mechanical, thermal and chemical stimuli. The stimulus-induced opening of TRPV1 results in calcium influx, the generation of an action potential and subsequently transmission of pain signals by nociceptive neurons.

Sensitization of TRPV1 underlies the development of inflammatory pain and is linked to the actions of nerve growth factor on its high-affinity tyrosine receptor kinase (Trk) A. Due to its involvement in chronic pain, TRPV1 is a potential candidate for pain relieving drugs.



Western blot of TrpV1 in mouse brain homogenate (25 µg/lane). **Cat# M-1714-100** detects bands at 60-100 kDa and 180-200 kDa corresponding to capsaicin receptor monomer and dimer.

Data generated using the LI-COR® C-DiGit® Blot Scanner

Additional Neurological Disease Antibodies

	Target	Purity	Host	Reactivity	Applications	Clone	Code
	Ancient ubiquitous protein 1	Whole serum	Sh	Hu, Rat, Bov, Sh	WB, IHC		**S-035-100**
NEW	**Phospho-α-CaMKII, Thr^{253}**	Whole serum	Rb	Hu, Ms	WB		**R-1706-100**
	Caspase 6	Affinity purified	Rb	Hu	WB, IHC		**R-1705-100**
	Coronin 1a	Whole serum	Rb	Hu, Rat, Ms, Feline	WB, IHC, IC		**R-1335-50**
	Cullin-4B	Affinity purified	Rb	Hu, Rat, Zebrafish	WB, IHC		**R-1141-100**
	ENC-1	IgG	Ms	Hu	WB, ELISA	3B1	**M-876-100**
	EP300	IgG	Ms	Hu	WB, IHC, ELISA	1D2	**M-833-50**
NEW	**GAPDH**	Purified	Rb	Hu, Rat, Ms, Bov	WB, IC		**R-1701-100**
NEW	**Heat Shock Protein 27**	Purified	Ch	Hu, Rat, Ms, Bov	WB, IC		**C-1700-100**
	Heat Shock Protein 40	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC		**R-1064-100**
NEW	**HMGB1**	Purified	Ms	Hu, Rat, Ms, Bov	WB, IC		**M-1702-100**
NEW	**Lamin A/C**	Purified	Rb	Hu, Rat, Ms, Bov	WB, IC		**R-1697-100**
NEW	**Lamin A/C**	Purified	Ch	Hu, Rat, Ms, Bov	WB, IC		**C-1698-100**
	MIF	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC		**R-1072-100**
	Neuropilin-1	IgG	Ms	Hu	WB, ELISA	1B3	**M-878-100**
	Placenta growth factor	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC		**R-1076-100**
	Sequestosome 1	Whole serum	Rb	Rat, Ms, Bov	IHC		**R-162-100**
	SKP2	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC		**R-1102-100**
	TNFAIP1	Affinity purified	Rb	Hu, Rat, Ms	WB, IHC, IC		**R-1347-100**
NEW	**Vimentin**	Purified	Rb	Hu, Rat, Ms, Bov	WB, IC		**R-1699-100**

Key: Mouse (Ms); Guinea pig (Gp); Human (Hu); Rabbit (Rb); Sheep (Sh); Chicken (Ch); Bovine (Bov); Goat (Gt); Immunohistochemistry (IHC); Immunofluorescence (IF); Immunopanning (IPan); Western Blot (WB); Immunohistochemistry/paraffin embedded IH(P); Immunoprecipitation (IP); Immunocytochemistry (IC); Blocking (BLK)