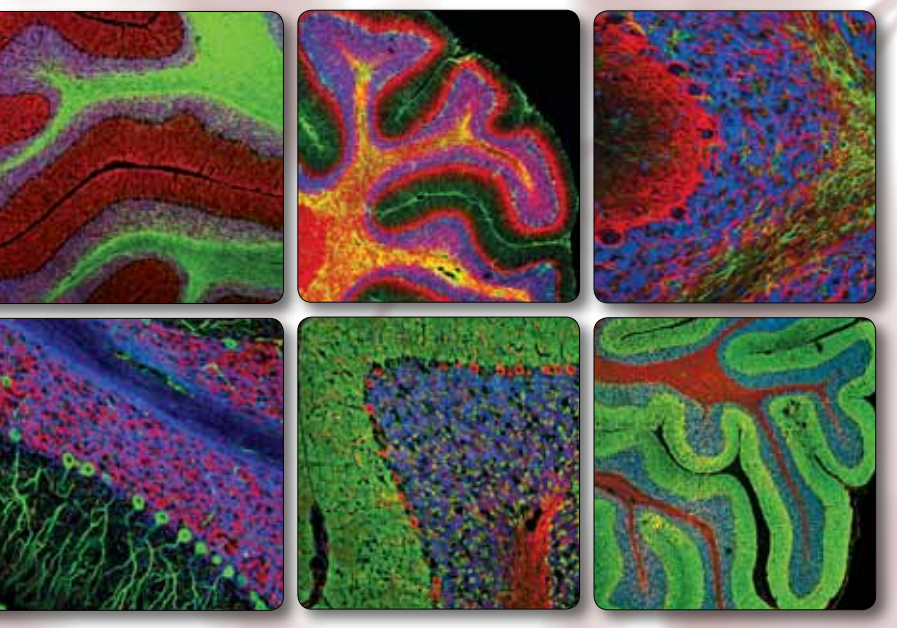
UNPARALLELED PRODUCT QUALITY, VALIDATION, AND TECHNICAL SUPPORT



Antibodies and Kits for the Study of Neuroscience

Cell Signaling TECHNOLOGY®

XP® Monoclonal Antibodies

for Neuroscience

XP® monoclonal antibodies are a line of high quality rabbit monoclonal antibodies exclusively available from Cell Signaling Technology (CST). Any product labeled with XP has been carefully selected based on superior performance in the most relevant applications.

XP monoclonal antibodies are generated using XMT® technology, a proprietary monoclonal method developed at CST. This technology provides access to a broad range of antibody-producing B cells unattainable with traditional monoclonal technologies, allowing more comprehensive screening and the identification of XP monoclonal antibodies with:

eXceptional specificity

As with all CST™ antibodies, the antibody is specific to your target of interest, saving you valuable time and resources.

+ eXceptional sensitivity

The antibody will provide a stronger signal for your target protein in cells and tissues, allowing you to monitor expression of low levels of endogenous proteins, saving you valuable materials.

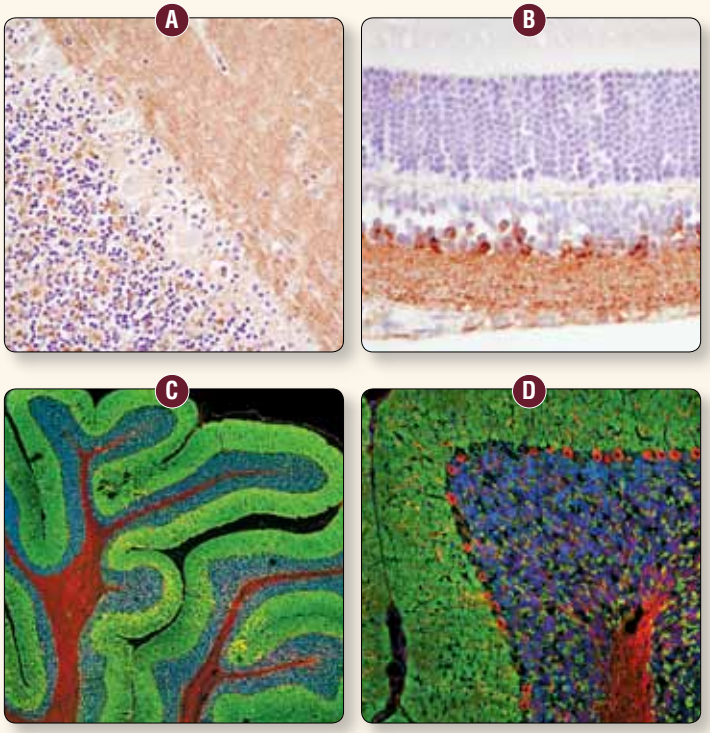
+ eXceptional stability and reproducibility

XMT technology combined with our stringent quality control ensures maximum lot-to-lot consistency and the most reproducible results.

= eXceptional Performance™

XMT technology coupled with our extensive antibody validation and stringent quality control delivers XP monoclonal antibodies with eXceptional Performance in the widest range of applications.

Synapsin-1 (D12G5) XP® Rabbit mAb #5297 is an example of an antibody with superior performance in a wide range of tested applications.



Synapsin-1 (D12G5) XP® Rabbit mAb #5297: IHC analysis of paraffin-embedded human cerebellum **(A)** and rat retina **(B)** using #5297. Confocal IF analysis of mouse brain **(C,D)** using #5297 (green) and β3-Tubulin (TU-20) Mouse mAb #4466 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

Visit our website for more experimental details, additional information, and a complete list of available XP monoclonal antibodies.

Antibodies and Kits for the Study of

Neuroscience

Cell Signaling Technology (CST) provides the highest quality activation-state and total protein antibodies for the study of molecular, cellular, and developmental neuroscience, as well as neurodegenerative diseases. CST™ antibodies have been extensively validated in-house using relevant cells and tissues in applications including western blot, immunofluorescence, immunohistochemistry, flow cytometry, and chromatin immunoprecipitation. XP® monoclonal antibodies are exclusively available from CST and demonstrate exceptional performance in the widest range of applications. As always, technical support is provided by the same scientists who produce and validate our products and know them best.

Neurons are the building blocks of extensive neural networks. Neurons transmit signals through electric potentiation, leading to synaptic signaling between neurons by the release and recognition of neurotransmitters. CST offers antibodies directed against neurotransmitter receptors, such as glutamate, GABA, and serotonin. These neurotransmitters cross the synaptic gap between individual neurons, resulting in intercellular signaling and the ability to rapidly communicate nervous system signals throughout the body.

At the molecular level, studies focus on individual chemical and protein participants in neuronal signaling events and brain function, such as Akt and GSK-3 involvment in the production of the characteristic neurofibrillary tangles found in Alzheimer's disease. CST offers antibodies, including a large selection of our exclusive XP® monoclonal antibodies, to many important targets to help investigate the role of Akt, GSK-3α, or GSK-3β in the hyperphosphorylation of Tau that leads to the formation of neurofibrillary tangles.

At the cellular level, neuroscience focuses on neuron growth, death, and morphology, which are primarily monitored by cell imaging and physiology studies, such as the voltage-clamp technique to investigate electrochemical signaling events. CST™ antibodies have been extensively validated in immunofluorescent and immunohistochemical applications, allowing the visualization of neural signaling events in cells, clinically relevant tissues, and disease models.

Developmental neuroscience studies the differentiation of neural stem cells along neural crest, glial, or neuronal lineages, and encompasses the growth and maturation of neurons and neuronal connectivity. CST has an extensive offering of neural lineage markers, including many XP® monoclonal antibodies, available for neural stem cell differentiation studies.

Devastating diseases arise from loss of neuron structure or function and are generally known as neurodegenerative diseases. The most well known neurodegenerative diseases include Alzheimer's, Huntington's, and Parkinson's. Neurodegenerative diseases may affect muscle coordination or cognition, and frequently culminate in dementia. CST offers antibodies against proteins involved in signaling events leading to neurodegeneration, as well as antibody markers to identify disease-state tissue or cell lines.

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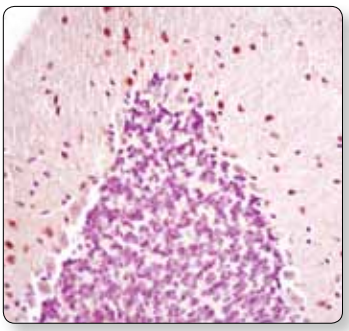
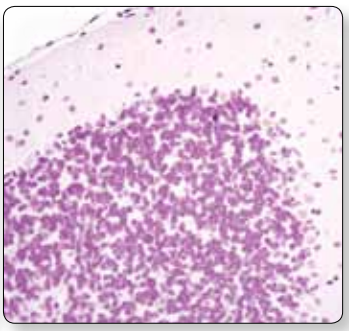
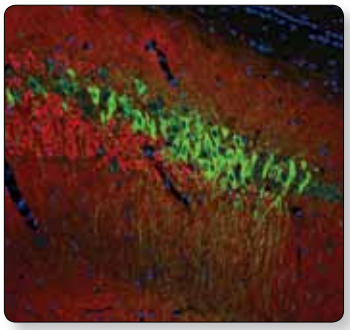
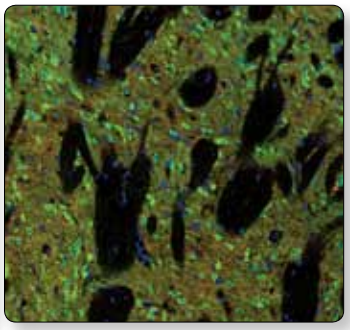
General Neuronal Signaling





nNOS (C7D7) Rabbit mAb #4231: IHC analysis of paraffin-embedded wild-type (left) or nNOS null (right) mouse brain using #4231.





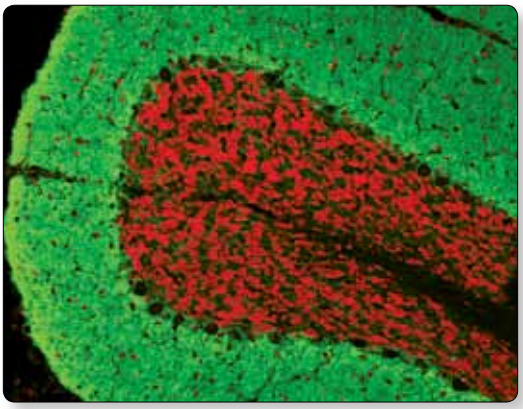
Nonphospho-STEP (Ser221) (D74H3) XP® Rabbit mAb #5659: Confocal IF analysis of rat hippocampus (left) and striatum (right) using #5659 (green) and α/β-Synuclein (Syn205) Mouse mAb #2644 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

	Applications	Reactivity
#4128 Ape1 Antibody	W, IF-F, IF-IC	H, M, R, (Mk)
#5935 BRSK1 (D10F2) Rabbit mAb	W, IP	H, M, R
NEW #5460 BRSK2 (D29B6) Rabbit mAb	W, IP	H, M, R
NEW #8096 CASK (D14E3) Rabbit mAb	W	H, M, R
NEW #8968 CASK (D24B12) Rabbit mAb	W, IP	H, M, R
NEW #9497 CASK (D38F6) Rabbit mAb	W	H, M, R
#2878 CASK Antibody	W	H, M, R
#4728 β2-Chimerin (2E3) Rat mAb	W	H, M, R
NEW #5393 Phospho-DARPP-32 (Thr34) (D29E8) Rabbit mAb	W	H, M, R
#2301 Phospho-DARPP-32 (Thr75) Antibody	W	M, R
#2306 DARPP-32 (19A3) Rabbit mAb	W, IP, IHC-P, IF-F	M, R, (H)
#2302 DARPP-32 Antibody	W	H, M, R
#4605 Phospho-Doublecortin (Ser297) Antibody	W	H, R, (M)
#3453 Phospho-Doublecortin (Ser334) Antibody	W, IP, IF-F	H, M, R
#4604 Doublecortin Antibody	W, IP, IF-F, F	H, M, R, Mk, Dm
#2771 DYRK1A Antibody	W, IP	H, M, (R)
NEW #5672 DYRK1B (D40D1) Rabbit mAb	W, IP	H, M, R, (Mk)
#2703 DYRK1B Antibody	W, IP	H, M, R, Mk
#4611 Dysbindin Antibody	W	H
NEW #5684 EAAT1 (D44E2) XP® Rabbit mAb	W, IP, IF-F	H, M, R
NEW #5685 EAAT1 (D20D5) Rabbit mAb	W, IP	H, M, R
#4166 EAAT1 Antibody	W	H, M, R
#3838 EAAT2 Antibody	W, IF-F	M, R, (H)
#2250 c-Fos (9F6) Rabbit mAb	W, IF-IC, F	H, M, R, (Hm, B, Pg)
#4384 c-Fos Antibody	W	H, M, R
#3975 Gα(o) Antibody	W	H, M, R
#3981 Gα(o) Antibody (IP Preferred)	IP	M, (H, R)
#3904 Gα(z) Antibody	W	H, M, R
#3992 Gα (pan) Antibody	W, IP, IHC-P	H, M, R, Mk, B
#3982 GRK2 Antibody	W, IP	H, M, R, Hm, Mk
NEW #8231 Homer1 Antibody	W	H, M, R
#3486 KCNE1 Antibody	W, IP	H, M, R, Mk
#4541 Phospho-MAP2 (Ser136) Antibody	W, IF-F	H, R, Mk, (M)

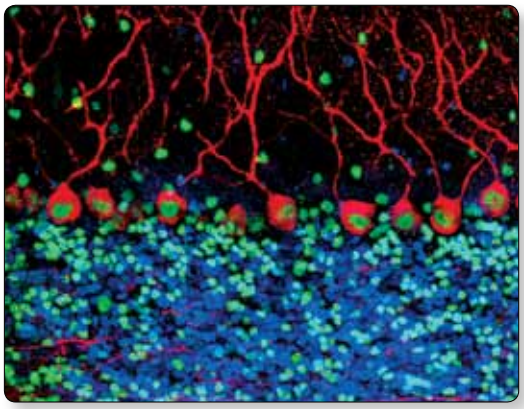
	Applications	Reactivity
#4544 Phospho-MAP2 (Thr1620/1623) Antibody	W	H, R, (M)
#4542 MAP2 Antibody	W, IF-F, IF-IC	H, M, R, Mk
#9163 Phospho-Merlin (Ser518) Antibody	W, IP	H, M, R, Mk
NEW #6995 Merlin (D1D8) Rabbit mAb	W, IP	H, M, R
#5310 mGluR1 Antibody	W, IP	H, M, R
#4235 NG2 Antibody	W	H, R, (M)
NEW #8351 NKCC1 (D13A9) Rabbit mAb	W, IP, IF-IC	H, (B, Pg)
#4828 NKCC1 Antibody	W, IP	H
#3382 NHERF1 (A140) Antibody	W	H
#3394 NHERF1 (A310) Antibody	W, IF-IC	H
#4456 Nna1 Antibody	W, IP	H, M, R
#4236 nNOS (C12H1) Rabbit mAb	W, IP, IHC-P	H, M, R
#4231 nNOS (C7D7) Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
#4234 nNOS Antibody	W	H, M, R
#3451 Phospho-μ-Opioid Receptor (Ser375) Antibody	W, IP, IF-F	M, (H)
NEW #5657 RAIG1 Antibody	W, IF-IC	H
#3321 Phospho-Ras-GRF1 (Ser916) Antibody	W	M, R
#3322 Ras-GRF1 Antibody	W	M
#3733 SAP102 (G670) Antibody	W	H, M, R
NEW #5659 Nonphospho-STEP (Ser221) (D74H3) XP® Rabbit mAb	W, IP, IF-F	H, M, R
#4817 STEP Antibody	W, IP	M, R, (H)
#4396 STEP (23E5) Mouse mAb	W, IP, IF-F	M, R
NEW #7495 TFAM Antibody	W, IP	H
NEW #9798 Thy1 Antibody	W, IP	H, M, R
#3370 Phospho-Tyrosine Hydroxylase (Ser31) Antibody	W, IP	R, (M)
#2791 Phospho-Tyrosine Hydroxylase (Ser40) Antibody	W, IF-IC	R, (H, M)
#2792 Tyrosine Hydroxylase Antibody	W, IF-IC	H, M, R
#3897 Human Brain-Derived Neurotrophic Factor (BDNF)		
#5221 Human β-Nerve Growth Factor (hβ-NGF)		
#5218 Human Neuregulin-1 (hNRG-1)		
#5237 Human Neurotrophin-3 (hNT-3)		
#5592 Human Neurotrophin-4 (hNT-4)		
#3828 Forskolin		

Unparalleled Product Quality, Validation, and Technical Support

APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA



EAAT1 (D44E2) XP® Rabbit mAb #5684: Confocal IF analysis of rat cerebellum using #5684 (green). Red = Propidium Iodide/ RNase #4087 (fluorescent DNA dye).



Phospho-μ-Opioid Receptor (Ser375) Antibody #3451: Confocal IF analysis of normal mouse cerebellum using #3451 (red) and CREB (86B10) Mouse mAb #9104 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

Application References:

DYRK1A Antibody #2771: Litovchick, L. et al. (2011) *Genes Dev.* 25, 801–813. (W)

DYRK1B Antibody #2703: Litovchick, L. et al. (2011) *Genes Dev.* 25, 801–813. (W)

Phospho-μ-Opioid Receptor (Ser375) Antibody #3451: Ozsoy, H.Z. et al. (2005) *Mol. Pharmacol.* 68, 447–458. (W) / Scholz, S. et al. (2004) *EMBO J.* 23, 3282–3289. (W) / Zheng, H. et al. (2011) *J. Biol. Chem.* 286, 12724–12733. (W)

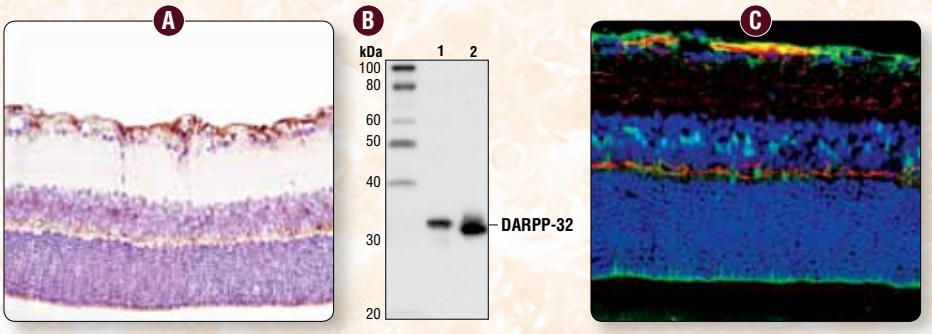
Phospho-Ras-GRF1 (Ser916) Antibody #3321: Yang, H. B. et al. (2003) *J. Biol. Chem.* 278, 13278-13285. (W, IF-IC) / Schmitt, J.M. et al. (2005) *J. Neurosci.* 25, 1281–1290. (W) / Norum, J.H. et al. (2005) *FEBS J.* 272, 2304–2316. (W) / Andressen, K.W. et al. (2006) *Mol. Pharmacol.* 69, 207–215. (W)

Ras-GRF1 Antibody #3322: Schmitt, J.M. et al. (2005) *J. Neurosci.* 25, 1281–1290. (W)

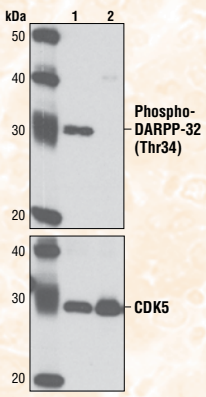
Phospho-Tyrosine Hydroxylase (Ser40) Antibody #2791: Gozal, E. et al. (2005) *J. Appl. Physiol.* 99, 642–649. (W) / Hui, A.S. et al. (2003) *Hypertension* 42, 1130–1136. (W)

DARPP-32

DARPP-32 (dopamine and cyclic AMP-regulated phosphoprotein, relative molecular mass 32,000) is a cytosolic protein highly enriched in medium-sized spiny neurons of the neostriatum. It is a bifunctional signaling molecule that controls serine/threonine kinase and serine/threonine phosphatase activity. Dopamine stimulates phosphorylation of DARPP-32 through D1 receptors and activation of PKA. PKA phosphorylation of DARPP-32 at Thr34 converts it into an inhibitor of protein phosphatase 1. DARPP-32 is converted into an inhibitor of PKA when phosphorylated at Thr75 by cyclin-dependent kinase 5 (CDK5). Mice containing a targeted deletion of the DARPP-32 gene exhibit an altered biochemical, electrophysiological, and behavioral phenotype.



DARPP-32 (19A3) Rabbit mAb #2306: IHC analysis of paraffin-embedded rat retina **(A)** using #2306. WB analysis of extracts from rat brain (lane 1) and mouse brain (lane 2) **(B)** using #2306. Confocal IF analysis of rat retina **(C)** using #2306 (green) and Neurofilament-H (RMdO 20) Mouse mAb #2836 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



Phospho-DARPP-32 (Thr34) (D29E8) Rabbit mAb #5393: WB analysis of extracts from wild-type (lane 1) and DARPP-32 (-/-) (lane 2) mouse striatum, using #5393 (upper) and CDK5 Antibody #2506 (lower). (Wild-type mouse striatum and DARPP-32 (-/-) mouse striatum were kindly provided by Dr. Paul Greengard and Helen Bateup, Rockefeller University, New York, NY.)

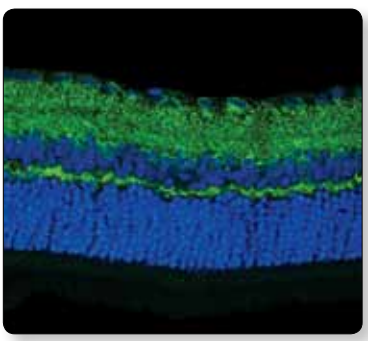
Application References:

Phospho-DARPP-32 (Thr75) Antibody #2301: Belkhiri, A. et al. (2005) *Cancer Res.* 65, 6583–6592. (W)

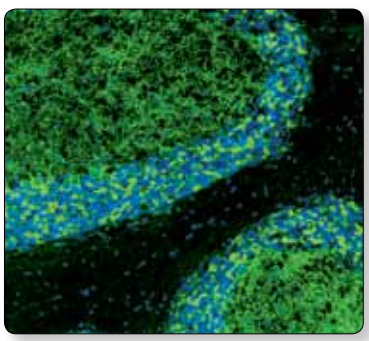
DARPP-32 Antibody #2302: Partida, G. J. et al. (2004) *J. Comp. Neurol.* 480, 251–263. (W) / Atkins, C.M. et al. (2005) *J. Neurosci.* 25, 5604–5610. (W) / Gu, L. et al. (2009) *PLoS One* 4, e6220. (W)

Synaptic Signaling

			Applications	Reactivity
	#4968	Pan-Actin Antibody	W, IHC-P	H, M, R, Mk, Z, (Dm, X, B, Pg)
	#4970	β-Actin (13E5) Rabbit mAb	W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, B, Pg, (C, Dg)
	#4967	β-Actin Antibody	W	H, M, R, Hm, Mk, Mi, Dm, Z, B, (C, X, Dg, Pg)
	#3700	β-Actin (8H10D10) Mouse mAb	W, IHC-P, IF-IC, F	H, M, R, Hm, Mk
NEW	#8084	Phospho-AMPA Receptor (GluR 1) (Ser845) (D10G5) Rabbit mAb	W, IP	H, M, R
	#3921	Phospho-AMPA Receptor (GluR 2) (Tyr869/Tyr873/Tyr876) Antibody	W	R, (H, M)
	#4027	Phospho-AMPA Receptor (GluR 2) (Tyr876) Antibody	W	R, (H, M)
	#2460	AMPA Receptor (GluR 2/3/4) Antibody	W	H, M, R
	#5117	AMPA Receptor (GluR 3) (D25G9) Rabbit mAb	W	H, M, R
	#4676	AMPA Receptor (GluR 3) (D47E3) Rabbit mAb	W, IP	H, M, R
	#3437	AMPA Receptor (GluR 3) Antibody	W, IP	H, M, R
NEW	#8070	AMPA Receptor (GluR 4) (D41A11) XP® Rabbit mAb	W, IP, IF-F	H, M, R
NEW	#8010	AMPA Receptor (GluR 4) (D19G9) Rabbit mAb	W, IP	H, M, R
	#3824	AMPA Receptor (GluR 4) (Ala60) Antibody	W	M, R, (H)
	#3825	AMPA Receptor (GluR 4) (Arg860) Antibody	W, IP	H, M, R
NEW	#3858	APPL1 (D83H4) XP® Rabbit mAb	W, IP, IF-IC	H, M, R, Mk
	#3276	APPL1 Antibody	W	H, M, R
	#3128	ARP2 Antibody	W	H, M, R, Hm, Mk, Dm
	#4738	ARP3 Antibody	W	H, Mk
NEW	#6897	Bassoon (D63B6) Rabbit mAb	W, IF-F	M, R, (H)
NEW	#8096	CASK (D14E3) Rabbit mAb	W	H, M, R
NEW	#8968	CASK (D24B12) Rabbit mAb	W, IP	H, M, R
NEW	#9497	CASK (D38F6) Rabbit mAb	W	H, M, R
	#2878	CASK Antibody	W	H, M, R
	#3251	Phospho-Caveolin-1 (Tyr14) Antibody	W	H, M, R, Mk, (Dg)
	#3267	Caveolin-1 (D46G3) XP® Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, B, Dg
	#3238	Caveolin-1 Antibody	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Hm, Z, B, Pg
	#2506	CDK5 Antibody	W, IP	H, M, R
	#4569	Phospho-Cortactin (Tyr421) Antibody	W, IP	H, M, R, Hm, Mk, B
	#3503	Cortactin (H222) Antibody	W, IP, IF-IC	H, Mk, B
	#3502	Cortactin Antibody	W, IHC-P	H, M, R, Mk
	#3455	Phospho-DRP1 (Ser616) Antibody	W, IP, IF-IC, F	H, (M, R, Mk)
	#4867	Phospho-DRP1 (Ser637) Antibody	W, IP	R, (H, M, Mk)
	#2342	Dynamin I/II Antibody	W, IP	H, M, R
	#4565	Dynamin-I (3G4B6) Mouse mAb	W, IP	H, M, R, Mk
	#3288	EEA1 (C45B10) Rabbit mAb	W, IP, IF-IC	H, M, R
	#2411	EEA1 Antibody	W, IP, IF-IC	H, M, R, Mk
	#3253	Flotillin-1 Antibody	W	H, M, R, Mk
	#3436	Flotillin-2 (C42A3) Rabbit mAb	W, IP, IF-IC	H, M, R, Mk
	#3244	Flotillin-2 (L294) Antibody	W	H, M, R, Mk
	#3835	GABA(B)R1 Antibody	W, IP	H, M, R
	#4819	GABA(B)R2 (C44A4) Rabbit mAb	W	H, M, R
	#3839	GABA(B)R2 Antibody	W, IP	H, M, R
	#5305	GAD1 Antibody	W	H, M, R



AMPA Receptor (GluR 4) (D41A11) XP® Rabbit mAb #8070: Confocal IF analysis of rat retina using #8070 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



GAD2 (D5G2) XP® Rabbit mAb #5843: Confocal IF analysis of mouse brain using #5843 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

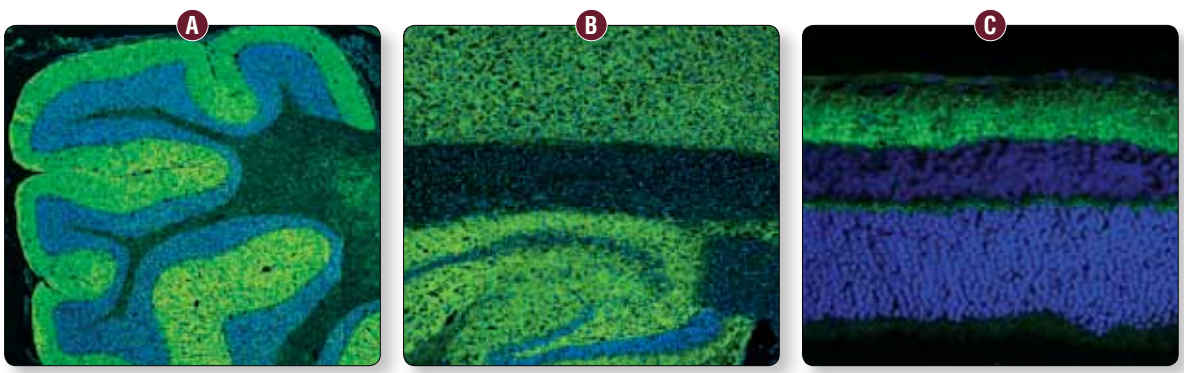
Application References:

Phospho-NMDAR1 (Ser890) Antibody #3381: Jarabek, B.R. et al. (2004) *Brain* 127, 505–516. (W)

Phospho-NMDAR1 (Ser897) Antibody #3385: Jarabek, B.R. et al. (2004) *Brain* 127, 505–516. (W)

Synapsin Antibody #2312: Levy, M. et al. (2003) *J. Biol. Chem.* 278, 17727–17734. (W)

Phospho-Synapsin (Ser9) Antibody #2311: Inan, M. et al. (2006) *J. Neurosci.* 26, 4338–4349. (W) / Bonanomi, D. et al. (2005) *J. Neurosci.* 25, 7299–7308. (W)



Bassoon (D63B6) Rabbit mAb #6897: Confocal IF analysis of rat cerebellum **(A)**, hippocampus **(B)**, and retina **(C)** using #6897 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

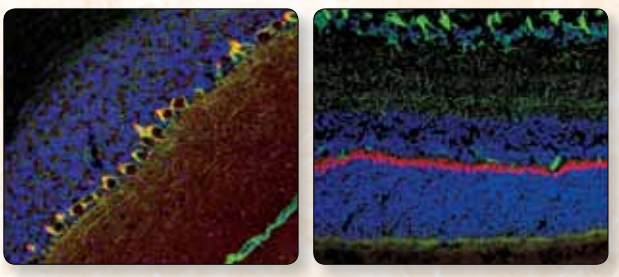
APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

			Applications	Reactivity
NEW	#5843	GAD2 (D5G2) XP® Rabbit mAb	W, IP, IF-F	H, M, R
	#3988	GAD2 Antibody	W, IF-F	M, R, (H)
	#3243	LAMP1 (C54H11) Rabbit mAb	W	H, M, Mk
	#3381	Phospho-NMDAR1 (Ser890) Antibody	W, IF-F	H, M, R
	#3384	Phospho-NMDAR1 (Ser896) Antibody	W	H, M, R
	#3385	Phospho-NMDAR1 (Ser897) Antibody	W	H, (M, R)
	#5704	NMDAR1 (D65B7) Rabbit mAb	W, IP	H, M, R
	#4206	Phospho-NMDAR2A (Tyr1246) Antibody	W, IP	R, (H, M)
	#4205	NMDAR2A Antibody	W	M, R, (H)
	#4209	Phospho-NMDAR2B (Tyr1070) Antibody	W	R, (H, M)
NEW	#5355	Phospho-NMDAR2B (Ser1284) Antibody	W, IP	M, R, (H)
	#4208	Phospho-NMDAR2B (Tyr1472) Antibody	W, IP	R, (H, M)
	#4212	NMDAR2B (D15B3) Rabbit mAb	W, IP	H, M, R
	#4207	NMDAR2B Antibody	W	H, M, R
	#5580	NMDAR2B (N59/36.1) Mouse mAb	W, IP	M, R
	#3924	NSF (D31C7) XP® Rabbit mAb	W, IP, IF-F	H, M, R, Mk
	#2145	NSF Antibody	W, IP, IF-F	H, M, R, Hm, Mk
	#3246	Profilin-1 (C56B8) Rabbit mAb	W	H, M, R, Hm, Mk, Dg
	#3237	Profilin-1 Antibody	W, IF-IC, F	H, M, R, B
	#2930	Phospho-PSD93 (Tyr340) Antibody	W, IP	R
	#3919	Phospho-PSD95 (Tyr236/Tyr240) Antibody	W	R, (H, M)
	#3450	PSD95 (D27E11) XP® Rabbit mAb	W, IF-F	H, M, R
	#3409	PSD95 (D74D3) XP® Rabbit mAb	W, IHC-P	H, M, R
	#2507	PSD95 Antibody	W, IP, IF-F	H, M, R
	#3930	Rab3A Antibody	W	H, M, R
	#2167	Rab4 Antibody	W	H, M, R, Hm, Mk
	#3547	Rab5 (C8B1) Rabbit mAb	W, IF-IC	H, M, R, Mk
	#2143	Rab5 Antibody	W, IF-IC	H, M, R, Hm, Mk

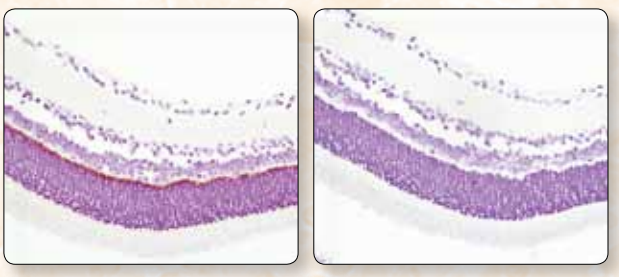
			Applications	Reactivity
	#3733	SAP102 (G670) Antibody	W	H, M, R
NEW	#9879	Serotonin Receptor 1A/5-HTR1A Antibody	W, IP	H
NEW	#8442	SLC1A4 Antibody	W	H, M
	#5308	SNAP25 (D7B4) Rabbit mAb	W, IP	H, M, R
	#5309	SNAP25 (D9A12) Rabbit mAb	W, IP	H, M, R
	#4117	SNAP25 (A195) Antibody	W	M, R, (H)
	#3926	SNAP25 (D110) Antibody	W	M, R, (H)
	#3757	SNIP/p140Cap Antibody	W	H, M, R, (Mk)
	#2503	Stargazin Antibody	W	H, M, R
	#2311	Phospho-Synapsin (Ser9) Antibody	W	H, M, R
	#5297	Synapsin-1 (D12G5) XP® Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
NEW	#6710	Synapsin-1 (D13C1) Rabbit mAb	W, IP	H, M, R
	#2312	Synapsin Antibody	W	M, R, (H)
	#5461	Synaptophysin (D35E4) XP® Rabbit mAb	W, IP, IF-F	H, M, R
	#5467	Synaptophysin (D40C4) Rabbit mAb	W, IP	H, M, R
	#4329	Synaptophysin Antibody	W	H, M, R
NEW	#5539	SynGAP (D20C7) Rabbit mAb	W, IP	M, R, (H)
NEW	#5540	SynGAP (D78B11) Rabbit mAb	W, IP	M, R, (H)
	#3200	SynGAP Antibody	W	M, R, (H)
	#2869	Syntaxin 6 (C34B2) Rabbit mAb	W, IP, IF-IC	H, M, R, Mk
	#2417	Syntaxin 6 Antibody	W, IP	H, M, R, Mk
	#4179	α-Synuclein (D37A6) XP® Rabbit mAb	W, IP, IHC-P, IF-F	M, R
	#2642	α-Synuclein Antibody	W, IP	H, M, R, Mk
	#2628	α-Synuclein Antibody (IF Preferred)	W, IF-F	H, M, R
	#2647	α-Synuclein (Syn204) Mouse mAb	W, IHC-P, IF-P	H
	#2644	α/β-Synuclein (Syn205) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
	#3347	SYT1 Antibody	W, IF-IC, F	H, M, R, Mk
	#4848	N-WASP (30D10) Rabbit mAb	W, IP	H, M, R, Hm, Mk, B

PSD95

Postsynaptic Density Protein 95 (PSD95) is a member of the membrane-associated guanylate kinase (MAGUK) family of proteins. These family members consist of an amino-terminal variable segment followed by three PDZ domains, an SH3 domain, and an inactive guanylate kinase (GK) domain. PSD95 is a scaffolding protein involved in the assembly and function of the postsynaptic density complex. PSD95 participates in synaptic targeting of AMPA receptors through an indirect manner involving stargazin and related transmembrane AMPA receptor regulatory proteins (TARPs). PSD95 is implicated in experience-dependent plasticity and plays an indispensable role in learning. Mutations in PSD95 are associated with autism.



PSD95 (D27E11) XP® Rabbit mAb #3450: Confocal IF analysis of rat cerebellum (left) and retina (right) using #3450 (red) and Neurofilament-L (DA2) Mouse mAb #2835 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



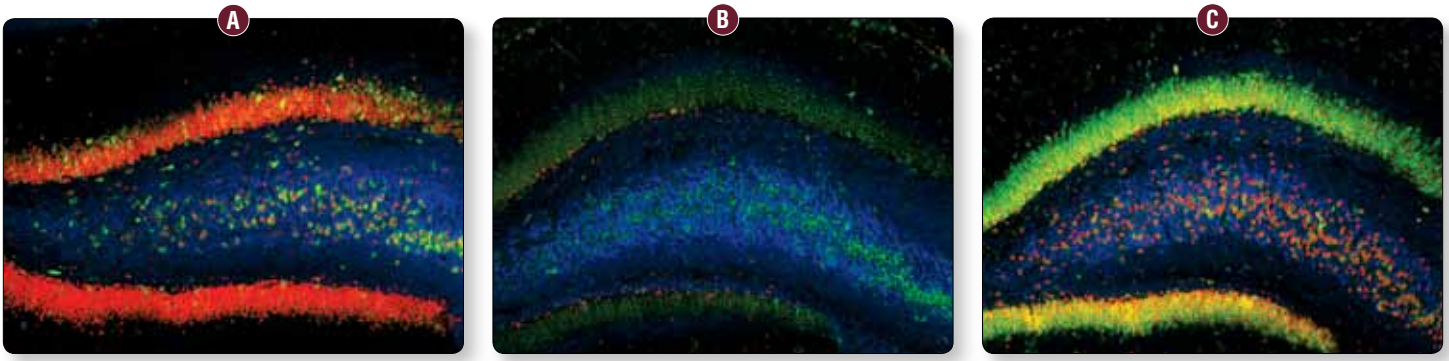
PSD95 (D74D3) XP® Rabbit mAb #3409: IHC analysis of paraffin-embedded rat retina using #3409 in the presence of control peptide (left) or antigen-specific peptide (right).

Unparalleled Product Quality, Validation, and Technical Support

REACTIVITY KEY:

H human / **M** mouse / **R** rat / **Hm** hamster / **Mk** monkey / **C** chicken / **Mi** mink / **Dm** D. melanogaster / **X** Xenopus / **Z** zebra fish / **B** bovine / **Dg** dog / **Pg** pig / **Sc** S. cerevisiae / **All** all species expected / **( )** 100% sequence homology

CREB



Phospho-CREB (Ser133) (87G3) Rabbit mAb #9198: Confocal IF analysis of rat dentate gyrus, either sham-operated **(A)** or 15 min ischemia followed by 30 min **(B)** and 4 h **(C)** reperfusion, using #9198 (red), Neurofilament-L (DA2) Mouse mAb #2835 (blue pseudocolor), and Phospho-S6 Ribosomal Protein (Ser235/236) (2F9) Rabbit mAb (Alexa Fluor® 488 Conjugate) #4854 (green).

CREB Antibody Comparison

	Reactivity	WB	IP	IHC	Flow	IF	ChIP
#4276 Phospho-CREB (Ser133) (D1G6) Rabbit mAb	H, M, R	++++	++++	–	–	N/T	++++
#9198 Phospho-CREB (Ser133) (87G3) Rabbit mAb	H, M, R	++++	–	++++	++++	+++	+++
#9187 Phospho-CREB (Ser133) (87G3) Rabbit mAb (Alexa Fluor® 488 Conjugate)	H, M, R	N/A	N/A	N/A	++++	++	N/A
#4095 Phospho-CREB (Ser133) (87G3) Rabbit mAb (Biotinylated)	H, M, R	++++	N/A	N/A	N/A	N/A	N/A
#9191 Phospho-CREB (Ser133) Antibody	H, M, R	++	++	–	–	–	–
#9196 Phospho-CREB (Ser133) (1B6) Mouse mAb	H, M, R	++	N/T	N/T	N/T	N/T	–
#4820 CREB (D76D11) Rabbit mAb	H, M, R, Hm, Mk, Dm	+++	++++	–	++++	+++	+++
#9197 CREB (48H2) Rabbit mAb	H, M, R, Mk, Dm	++++	++++	++++	++++	++++	+++
#4034 CREB (48H2) Rabbit mAb (Biotinylated)	H, M, R, Mk, Dm	++++	N/A	N/A	N/A	N/A	N/A
#3955 CREB (48H2) Rabbit mAb (Sepharose Bead Conjugate)	H, M, R, Mk	N/A	++++	N/A	N/A	N/A	N/A
#9104 CREB (86B10) Mouse mAb	H, M, R, Mk	+++	–	–	+++	++	–

Testing Key: ++++ Very Highly Recommended / +++ Highly Recommended / ++ Recommended – Not Recommended / N/T Not Tested / N/A Not Applicable

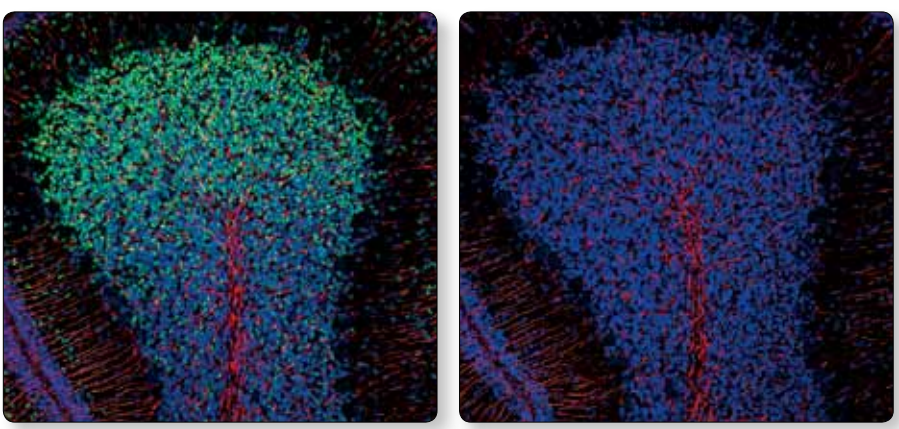
Application References:

Phospho-CREB (Ser133) (87G3) Rabbit mAb #9198: Zbytek, B. et al. (2006) *Mol. Endocrinol.* 20, 2539–2547. (W) / Kumar, A.P. et al. (2007) *Clin. Cancer Res.* 13, 2784–2794. (IHC-P) / Ghosh, R. et al. (2007) *Neoplasia* 9, 893–899. (IHC-P) / Zaru, R. et al. (2007) *Nat. Immunol.* 8, 1227–1235. (W) / Gaddini, L. et al. (2009) *Neurobiol. Dis.* 35, 278–285. (W, IF-IC)

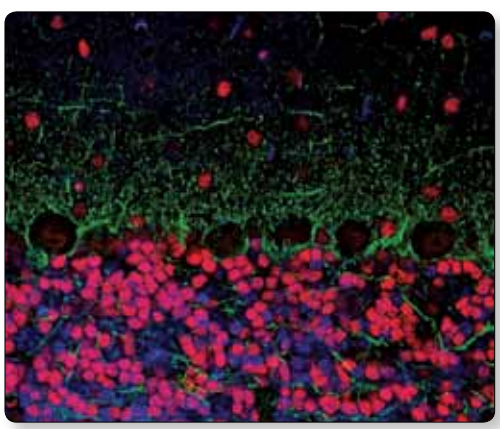
Phospho-CREB (Ser133) Antibody #9191: Huang, H. et al. (2001) *J. Biol. Chem.* 276, 38830–38836. (W) / Pláteník, J. et al. (2005) *J. Neurochem.* 95, 1446–1460. (W) / Sakaguchi, M. et al. (2008) *Mol. Biol. Cell* 19, 78–85. (W) / Almeida, L.E. et al. (2009) J. *Neurosci.* 29, 12702–12710. (W)

Phospho-CREB (Ser133) (1B6) Mouse mAb #9196: Moore, S.W. and Kennedy, T.E. (2006) *J. Neurosci.* 26, 2419–2423. (W) / Bouchard, J.F. et al. (2004) *J. Neurosci.* 24, 3040–3050. (W) / Dalle, S. et al. (2004) *J. Biol. Chem.* 279, 20345–20355. (W)

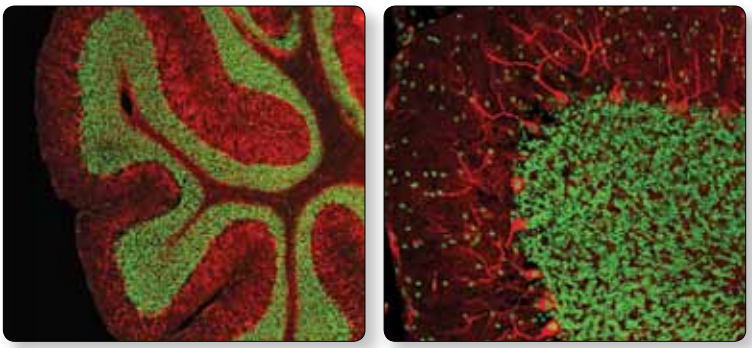
CREB (48H2) Rabbit mAb #9197: Kumar, A.P. et al. (2007) *Clin. Cancer Res.* 13, 2784–2794. (IHC-P) / Ghosh, R. et al. (2007) *Neoplasia* 9, 893–899. (IHC-P) / Banno, Y. et al. (2008) *J. Neurochem.* 104, 1372–1386. (W) / Sakaguchi, M. et al. (2008) *Mol. Biol. Cell* 19, 78–85. (W) / Almeida, L.E. et al. (2009) *J. Neurosci.* 29, 12702–12710. (W) / Gaddini, L. et al. (2009) *Neurobiol. Dis.* 35, 278–285. (W)



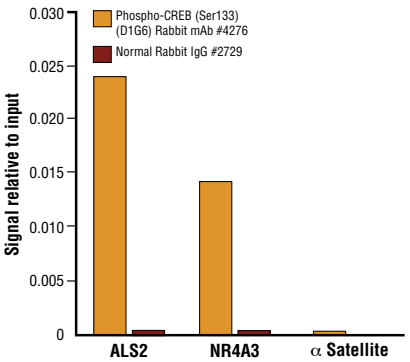
Phospho-CREB (Ser133) (87G3) Rabbit mAb (Alexa Fluor® 488 Conjugate) #9187: Confocal IF analysis of P14 rat cerebellum, untreated (left) or λ phosphatase-treated (right), using #9187 (green) and GFAP (GA5) Mouse mAb #3670 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



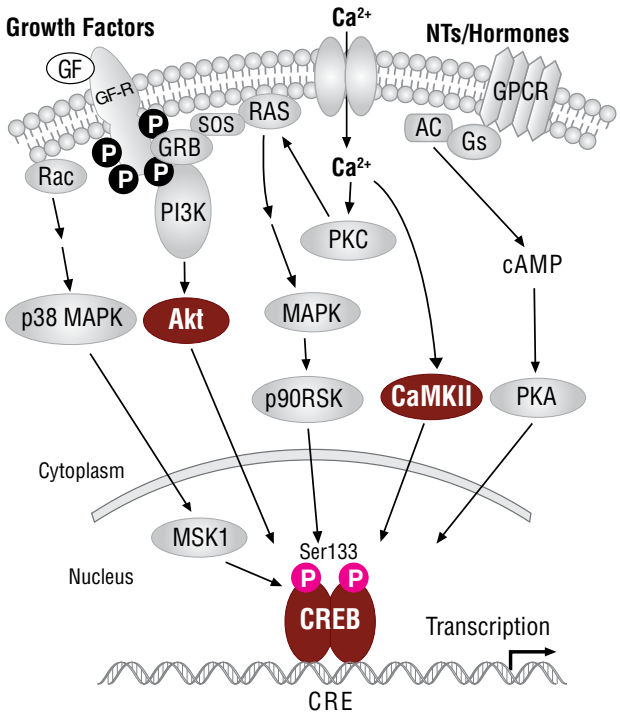
CREB (48H2) Rabbit mAb #9197: Confocal IF analysis of mouse cerebellum using #9197 (red) and Neurofilament-L (DA2) Mouse mAb #2835 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



CREB (D76D11) Rabbit mAb #4820: Confocal IF analysis of mouse cerebellum using #4820 (green) and β3-Tubulin (TU-20) Mouse mAb #4466 (red).



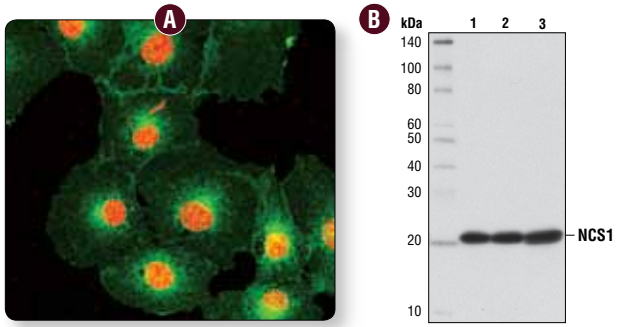
Phospho-CREB (Ser133) (D1G6) Rabbit mAb #4276: Chromatin IPs were performed with cross-linked chromatin from 4 x 10^6 293 cells treated with Forskolin #3828 (30 µM) for 1 hr and either 10 µl of #4276 or 2 µl of Normal Rabbit IgG #2729 using SimpleChIP® Enzymatic Chromatin IP Kit (Magnetic Beads) #9003. The enriched DNA was quantified by real-time PCR using human ALS2 exon 1 primers, SimpleChIP® Human NR4A3 Promoter Primers #4829, and SimpleChIP® Human α Satellite Repeat Primers #4486. The amount of immunoprecipitated DNA in each sample is represented as signal relative to the total amount of input chromatin, which is equivalent to one.



Unparalleled Product Quality, Validation, and Technical Support

Calcium Signaling

			Applications	Reactivity
	#4061	N-Cadherin Antibody	W	H, M, R, Mk
	#2173	Calbindin (C26D12) Rabbit mAb	W, IP, IHC-P	H, M, R
	#2614	Pan-Calcineurin A Antibody	W, IP, IF-IC, F	H, M, R, Mk, Dm, (C, X, B, Pg)
	#4146	Calpastatin Antibody	W, IP	H, M, R
	#3365	CamKI-δ Antibody	W	H, R, (M)
	#3356	Phospho-CaMKII (Tyr231) Antibody	W	R, (H)
	#3361	Phospho-CaMKII (Thr286) Antibody	W	H, M, R
	#4436	CaMKII (pan) (D11A10) Rabbit mAb	W	H, M, R
	#3362	CaMKII pan Antibody	W	H, M, R, Mk
	#3357	CaMKII-α Antibody	W	H, M, R
	#4032	CaMKIV Antibody	W, IP	H, M, R
	#3760	Phospho-IP3 Receptor (Ser1756) Antibody	W	H, M, R
NEW	#8568	IP3 Receptor 1 (D53A5) Rabbit mAb	W, IP	H, M, R
	#3763	IP3 Receptor Antibody	W, IP	H, M, R
NEW	#8237	NCS1 (D12D2) XP® Rabbit mAb	W, IP, IF-IC	H, M, R, Hm, Mk
	#2395	PDE5 Antibody	W	H, M
NEW	#5668	STIM1 (D88E10) Rabbit mAb	W, IP, IF-IC	H, M, R, Mk, B
	#4149	STIM1 (G555) Antibody	W, IP	H, M, R
	#4916	STIM1 Antibody	W, IP	H, M, R, Mk
	#4917	STIM2 Antibody	W, IF-IC	H, M, R, Mk

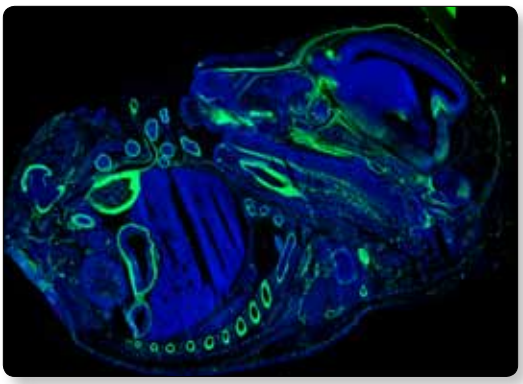


NCS1 (D12D2) XP® Rabbit mAb #8237: Confocal IF analysis of COS-7 cells **(A)** using #8237 (green). Red = Propidium Iodide (PI)/RNase Staining Solution #4087 (fluorescent DNA dye). WB analysis of extracts from mouse brain (lane 1), rat brain (lane 2), and human cerebellum (lane 3) **(B)** using #8237.

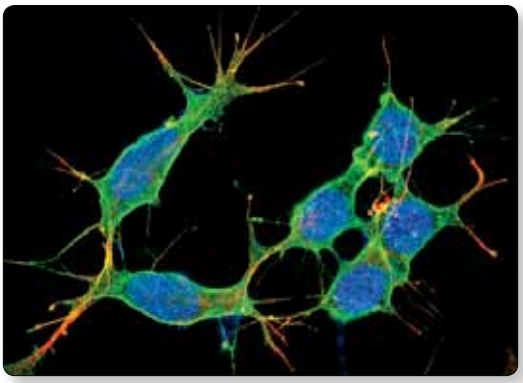
Application References:

Phospho-CaMKII (Thr286) Antibody #3361: Atkins, C.M. et al. (2006) *J. Cereb. Blood Flow Metab.* 26, 1507–1518. (W)

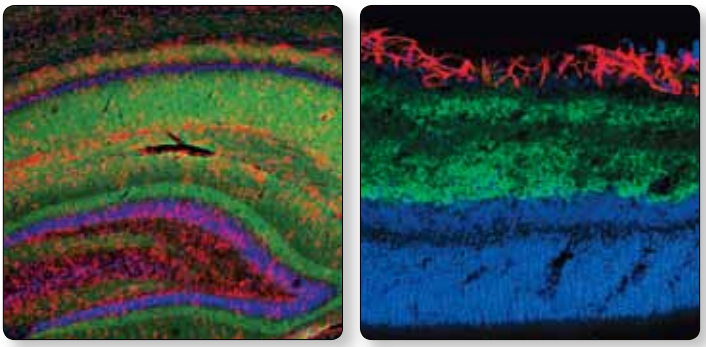
Neuronal Development



Neuropilin-2 (D39A5) XP® Rabbit mAb #3366: Confocal IF analysis of E14.5 mouse embryo using #3366 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



p75NTR (D4B3) XP® Rabbit mAb #8238: Confocal IF analysis of SK-N-MC cells using #8238 (green). Actin filaments were labeled with DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



GAP43 (D9C8) Rabbit mAb #8945: Confocal IF analysis of rat hippocampus (left) and retina (right) using #8945 and GFAP (GA5) Mouse mAb (Alexa Fluor® 555 Conjugate) #3656 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

			Applications	Reactivity
NEW	#8038	Phospho-CDC20 (Ser51) Antibody	W, IP	H, M, (R)
	#9397	Phospho-CRMP-2 (Thr514) Antibody	W	H, M, R
	#9393	CRMP-2 Antibody	W, IF-IC	H, M, R
	#3327	Phospho-Dab1 (Tyr220) Antibody	W	H, (M, R)
	#3325	Phospho-Dab1 (Tyr232) Antibody	W	H, (M, R)
	#3328	Dab1 Antibody	W	H, (M, R)
	#4804	DCBLD2 Antibody	W	H, M, R, (Mk)
	#4153	EGR1 (15F7) Rabbit mAb	W, IP, IHC-P, IF-IC, ChIP	H, M, R, (B)
	#4154	EGR1 (44D5) Rabbit mAb	W, IP, IF-IC, F, ChIP	H, M, R, (B)
	#2274	MELK Antibody	W, IP	H, M, Dm
	#4760	Nestin (Rat-401) Mouse mAb	IHC-P, IF-F	R
NEW	#2046	NGF Antibody	W	H, M
	#4373	NeuroD (D35G2) Rabbit mAb	W, IP, ChIP	H, M, R
NEW	#7019	NeuroD (D90G12) Rabbit mAb	W, IP	H
	#2833	NeuroD Antibody	W, IP	H, (M, R)
	#3725	Neuropilin-1 (D62C6) XP® Rabbit mAb	W, IP	H, M
	#3366	Neuropilin-2 (D39A5) XP® Rabbit mAb	W, IP, IHC-P, IF-F	M, R
NEW	#8238	p75NTR (D4B3) XP® Rabbit mAb	W, IP, IF-IC	H, M, R
	#4201	p75NTR (D8A8) Rabbit mAb	W, IP	H, M, R
	#2693	p75NTR Antibody	W	H, R, (M)
	#3813	Plexin A1 Antibody	W, IP, IHC-P	H, R, (M)
NEW	#5658	Plexin A2 (D42B5) Rabbit mAb	W, IP	H, M, R
NEW	#6896	Plexin A2 (D44D4) Rabbit mAb	W	H, M, R
	#3994	Plexin A2 Antibody	W, IP	H, M, R
	#5512	Plexin A3 (D2G12) Rabbit mAb	W, IP	H
	#3816	Plexin A4 (C5D1) Rabbit mAb	W, IP	M, R, (H)
NEW	#5622	Phospho-Semaphorin 4B (Ser825) Antibody	W	H, M, R
	#3355	Semaphorin 4B Antibody	W	H
	#3279	Shootin1 Antibody	W, IP	H, M, R
NEW	#6978	TACE (D22H4) Rabbit mAb	W	H
	#3976	TACE Antibody	W, IP	H, Mk

Trk Antibody Comparison

		Reactivity	WB	IP	IHC	Flow	IF
#4619	Phospho-TrkA (Tyr490)/TrkB (Tyr516) (C35G9) Rabbit mAb	H, R, (M)	+++	++	-	-	-
#9141	Phospho-TrkA (Tyr490) Antibody	R, (H, M)	+++	++	-	N/T	-
#4621	Phospho-TrkA (Tyr674/675)/TrkB (Tyr706/707) (C50F3) Rabbit mAb	H, R, (M)	++++	++	-	-	-
#4168	Phospho-TrkA (Tyr785)/TrkB (Tyr816) (C67C8) Rabbit mAb	H, R, (M)	+++	-	N/T	N/T	N/T
#4609	Trk (pan) (C17F1) Rabbit mAb	H, M, R	++++	+++	-	+++	+++
#2508	TrkA (14G6) Rabbit mAb	H	++++	-	++++	-	-
#2505	TrkA Antibody	H, M, R	+++	-	-	-	-
#4603	TrkB (80E3) Rabbit mAb	H, M, R	++++	-	-	N/T	N/T
#4607	TrkB (80G2) Rabbit mAb	H, (M, R)	-	N/T	++++	+++	-
#4606	TrkB Antibody	H	++	-	-	-	-
#3376	TrkC (C44H5) Rabbit mAb	H, M, R	++++	+++	N/T	-	+++

Testing Key: ++++ Very Highly Recommended / +++ Highly Recommended / ++ Recommended – Not Recommended / N/T Not Tested / N/A Not Applicable

Application References:

Phospho-Semaphorin 4B (Ser825) Antibody #5622: Moritz, A. et al. (2010) *Sci. Signal.* 3, ra64. (W)

Phospho-TrkA (Tyr490) Antibody #9141: Reuther, G.W. et al. (2000) *Mol. Cell. Biol.* 20, 8655–8666. (W) / Anneren, C. et al. (2000) *J. Biol. Chem.* 275, 29153–29161. (W) / Gil, C. et al. (2000) *FEBS Lett.* 481, 177–182. (W)

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APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

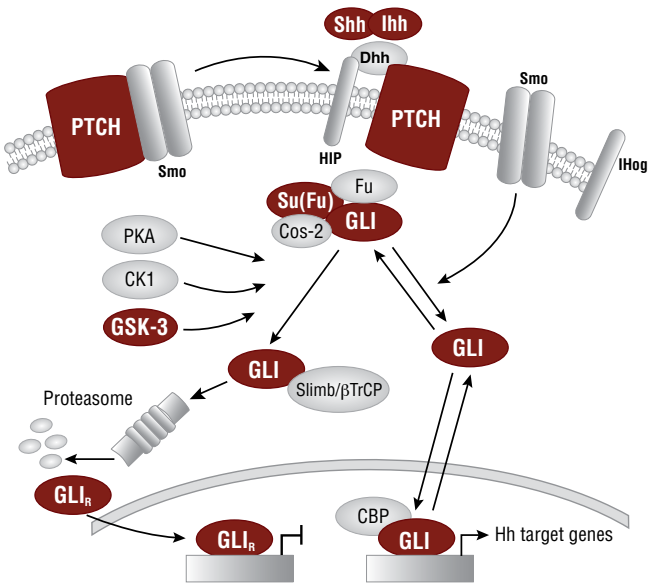
Notch and Hedgehog Signaling

Notch Signaling

		Applications	Reactivity
	#2663 Deltex-2 Antibody	W, IP	M, (H, R)
	#2588 DLL1 Antibody	W, IP	R, (H)
	#2483 DLL3 (G93) Antibody	W, IP	R, (M)
	#2589 DLL4 Antibody	W, IP	H
	#2155 Jagged1 (1C4) Rabbit mAb	W	H
	#2620 Jagged1 (28H8) Rabbit mAb	W, IP	H, (M, R)
	#2210 Jagged2 (C23D2) Rabbit mAb	W, IP	H, R
	#2205 Jagged2 (C83A8) Rabbit mAb	W, IP	H
	#4608 MAML1 Antibody	W, IP, IF-IC	H
NEW	#6988 MAML2 (D41E6) Rabbit mAb	W, IP	H, M, R
	#4618 MAML2 Antibody	W, IP	H, M, R, Mk
NEW	#5663 Musashi-1 (D46A8) XP® Rabbit mAb	W, IF-F	H, M, R
	#2154 Musashi Antibody	W, IF-F	H, M, R, (Z)
NEW	#5665 Nicastrin (D38F9) Rabbit mAb	W	H, M, R, Hm, Mk
	#3632 Nicastrin Antibody	W	H, M, R, Mk
NEW	#9878 Phospho-Numb (Ser276) (D5C2) Rabbit mAb	W, IF-IC	H, (M, R, C, X, Z, B)
	#4140 Phospho-Numb (Ser276) Antibody	W	H, M, R
	#2756 Numb (C29G11) Rabbit mAb	W, IP, IF-IC, F	H, M, R, Mk
	#2761 Numb (C44B4) Rabbit mAb	W, IP, IF-IC, F	H
	#2733 Numb Antibody	W	H
NEW	#5643 Presenilin 1 (D39D1) Rabbit mAb	W, IP	H, M, R, Mk
	#3622 Presenilin 1 Antibody	W, IP	H, R, Mk, (M)
NEW	#9979 Presenilin 2 (D30G3) Rabbit mAb	W, IP	H, M, R
	#2192 Presenilin 2 Antibody	W, IP	H, M, R, Mk
NEW	#8238 p75NTR (D4B3) XP® Rabbit mAb	W, IP, IF-IC	H, M, R
	#4201 p75NTR (D8A8) Rabbit mAb	W, IP	H, M, R
	#2693 p75NTR Antibody	W	H, R, (M)
NEW	#6978 TACE (D22H4) Rabbit mAb	W	H
	#3976 TACE Antibody	W, IP	H, Mk

Hedgehog Signaling

	Applications	Reactivity
#3538 GLI1 (C68H3) Rabbit mAb	W, IP	H
#2553 GLI1 Antibody	W, IP	H
#2534 GLI1 (V812) Antibody	W, IP	H, (M, R)
#2643 GLI1 (L42B10) Mouse mAb	W, IP	H
#2585 GLI2 (R770) Antibody	W, IP	H
#2468 PTCH1 (C53A3) Rabbit mAb	W, IP	H
#2470 PTCH2 (G1191) Antibody	W, IP	H
#2464 PTCH2 (L849) Antibody	W, IP	H
#2207 Shh (C9C5) Rabbit mAb	W	H, R, Z, (M)
#2287 Shh Antibody	W, IP	M, (H, Dg)
#2271 Shh/Ihh Antibody	W	M, (H, R)
#2520 SUFU (C54G2) Rabbit mAb	W, IP	H, M, R, Mk
#2522 SUFU (C81H7) Rabbit mAb	W, IP	H, M, Mk

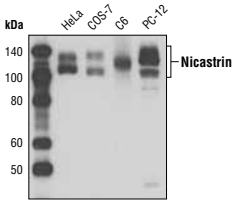


Notch Antibody Comparison

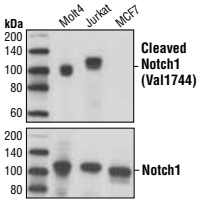
		Reactivity	WB	IP	IHC	Flow	IF
#4147	Cleaved Notch1 (Val1744) (D3B8) Rabbit mAb	H, M, R	++++	+++	-	-	-
#2421	Cleaved Notch1 (Val1744) Antibody	H, M, R, Mk	+++	++	-	-	-
#3608	Notch1 (D1E11) XP® Rabbit mAb	H, M, R	++++	-	++++	-	-
#4380	Notch1 (D6F11) XP® Rabbit mAb	H, M, R	++++	-	-	++++	++++
#3439	Notch1 (C37C7) Rabbit mAb	H	+++	+++	-	-	-
#3268	Notch1 (C44H11) Rabbit mAb	H, (M, R)	++	-	N/T	N/T	-
#3447	Notch1 (5B5) Rat mAb	H, M, R, B	++++	++	-	-	N/T
#4530	Notch2 (D67C8) XP® Rabbit mAb	H, R	++++	+++	-	-	+++
#5732	Notch2 (D76A6) XP® Rabbit mAb	H, M, R	++++	+++	N/T	+++	+++
#2420	Notch2 (8A1) Rabbit mAb	H	+++	+++	N/T	-	-
#5276	Notch3 (D11B8) Rabbit mAb	H	++++	++++	-	-	-
#2889	Notch3 Antibody	H	++++	++	N/T	N/T	N/T
#3446	Notch3 (8G5) Rat mAb	H, R	++	++	-	N/T	-
#2423	Notch4 (L5C5) Mouse mAb	H	++	++	N/T	N/T	N/T

Testing Key: ++++ Very Highly Recommended / +++ Highly Recommended / ++ Recommended – Not Recommended / N/T Not Tested / N/A Not Applicable

Nicastrin (D38F9) Rabbit mAb #5665: WB analysis of extracts from various cell lines using #5665.



Cleaved Notch1 (Val1744) (D3B8) Rabbit mAb #4147: WB analysis of extracts from various cell lines using #4147 (upper) or Notch1 (D1E11) XP® Rabbit mAb #3608 (lower).



Application References:

Cleaved Notch1 (Val1744) Antibody #2421: Phiel, C.J. et al. (2003) *Nature* 423, 435–439. (W) / Tokunaga, A. et al. (2004) *J. Neurochem.* 90, 142–154. (W, IF-IC) / Ishikura, N. et al. (2005) *Proc. Natl. Acad. Sci. USA* 102, 886–891. (W) / Huppert, S.S. et al. (2005) *Dev. Cell* 8, 677–688. (W) / O'Neil, J. et al. (2007) *J. Exp. Med.* 204, 1813–1824. (W) / Köchert, K. et al. (2011) *Oncogene* 30, 1831–1840. (W)

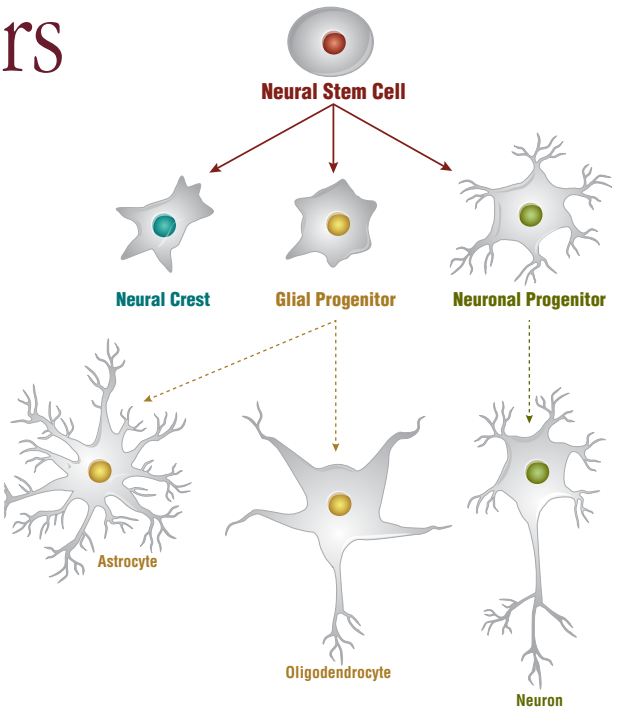
Presenilin 1 Antibody #3622: Kitazawa, M. et al. (2006) *Am. J. Pathol.* 168, 1986–1997. (W)

Presenilin 2 Antibody #2192: Hashimoto, Y. et al. (2002) *J. Pharma. Exp. Thera.* 300, 736–745. (W)

TACE Antibody #3976: Xu, P. and Derynck, R. (2010) *Mol. Cell* 37, 551–566. (W)

Neural Lineage Markers

Neural stem cells differentiate into the various cell types which compose the peripheral and central nervous systems. Neural stem cells can differentiate into neural crest cells, glial progenitor cells, or neuronal progenitor cells. Neural crest cells are a multipotent cell type and ultimately differentiate along lineages including cranial, trunk, vagal and sacral, and cardiac neural crest, giving rise to craniofacial cartilage and bone, ganglia, melanocytes, connective tissue, and in some cases even neurons. Glial progenitor cells develop into microglia and macroglia which support and protect the neuronal network of the brain, but are not neurons. Astrocytes are the most common type of macroglia in the Central Nervous System (CNS), and serve to monitor and regulate the chemical environment of neurons and to maintain the blood-brain barrier. Oligodendrocytes, also present in the CNS, coat axons to form the axonal myelin sheath. Neuronal progenitor cells differentiate fully into neurons, which decode and respond to neurochemical and electric signals.



Neural Stem Cell

	Applications	Reactivity
#4477 ABCG2 Antibody	W	H, M, R, (Mk, X, B, Dg)
#3508 Brg1 (A52) Antibody	W, IF-IC	H, M, Mk, (R)
#3514 Brg1 (P680) Antibody	W	H, Mk, M, R
#9894 CEND1 Antibody	W, IF-F	H, M, R
#4540 EOMES Antibody	W	M, (H, R, Mk)
#2894 FGF Receptor 4 Antibody	W	M, (H)
#5269 HMGA2 Antibody	W, IP	H, M, R
#3431 Id2 (D39E8) Rabbit mAb	W, IP	H, M, Mk
#2088 LEDGF (C57G11) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, (Mk)
#4787 Msx1 (G116) Antibody	W	H
#5378 Msx1 (P5) Antibody	W	H, (Mk)
NEW #5663 Musashi-1 (D46A8) XP® Rabbit mAb	W, IF-F	H, M, R
#2154 Musashi Antibody	W, IF-F	H, M, R, (Z)
#4420 NAC1 Antibody (Human Preferred)	W	H, (Mk)
#4183 NAC1 Antibody (Rodent Preferred)	W	M, R, (H)
#4760 Nestin (Rat-401) Mouse mAb	IHC-P, IF-F	R
#4373 NeuroD (D35G2) Rabbit mAb	W, IP, ChIP	H, M, R
NEW #7019 NeuroD (D90G12) Rabbit mAb	W, IP	H
#2833 NeuroD Antibody	W, IP	H, (M, R)
#5417 GCNF Antibody	W	H, M, R
NEW #8238 p75NTR (D4B3) XP® Rabbit mAb	W, IP, IF-IC	H, M, R
#4201 p75NTR (D8A8) Rabbit mAb	W, IP	H, M, R
#2693 p75NTR Antibody	W	H, R, (M)
#4194 Sox1 Antibody	W, IF-F	M, R, (H)
#3579 Sox2 (D6D9) XP® Rabbit mAb	W, IHC-P, IF-IC, F	H, (Mk, B, Dg)
#5049 Sox2 (D6D9) XP® Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H, (Mk, B, Dg)
#5179 Sox2 (D6D9) XP® Rabbit mAb (Alexa Fluor® 555 Conjugate)	IF-IC	H, (Mk, B, Dg)
#5067 Sox2 (D6D9) XP® Rabbit mAb (Alexa Fluor® 647 Conjugate)	IF-IC, F	H, (Mk, B, Dg)
#3728 Sox2 (C70B1) Rabbit mAb (IHC Specific)	W, IHC-P	M

Neural Stem Cell

	Applications	Reactivity
#2748 Sox2 Antibody	W, IP, ChIP	H, M, (R, Mk, B, Dg)
#4195 Sox2 (L73B4) Mouse mAb	W	H, M, (Mk, B, Dg)
#4900 Sox2 (L1D6A2) Mouse mAb	W, IF-IC, F	H, M, (R, B, Dg)
NEW #5666 β3-Tubulin (D65A4) XP® Rabbit mAb	W, IP, IHC-P	H, M, R
#5568 β3-Tubulin (D71G9) XP® Rabbit mAb	W, IP, IF-F	H, M, R
#4466 β3-Tubulin (TU-20) Mouse mAb	W, IHC-P, IF-F	H, M, R
NEW #5741 Vimentin (D21H3) XP® Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
NEW #9854 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H, M, R, Mk
NEW #9855 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 555 Conjugate)	IF-IC	H, M, R, Mk
NEW #9856 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 647 Conjugate)	IF-IC, F	H, M, R, Mk
#3932 Vimentin (R28) Antibody	W, IF-IC	H, M, R, Mk
#3390 Vimentin (5G3F10) Mouse mAb	W	H, Mk

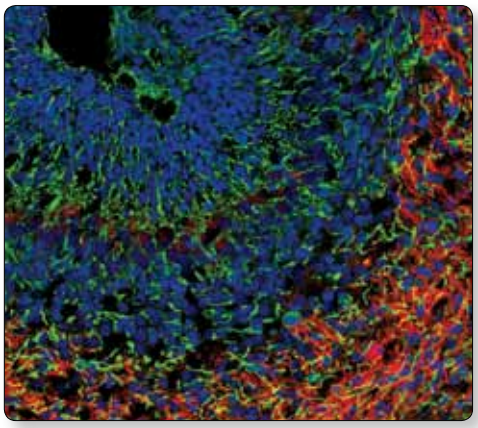
Neural Crest

	Applications	Reactivity
#2019 FoxD3 (D20A9) Rabbit mAb	W	H
#4600 Integrin α4 Antibody	W, IP	H
#4787 Msx1 (G116) Antibody	W	H
#5378 Msx1 (P5) Antibody	W	H, (Mk)
#4147 Cleaved Notch1 (Val1744) (D3B8) Rabbit mAb	W, IP	H, M, R
#2421 Cleaved Notch1 (Val1744) Antibody	W, IP	H, M, R, Mk
#3608 Notch1 (D1E11) XP® Rabbit mAb	W, IHC-P	H, M, R
NEW #4380 Notch1 (D6F11) XP® Rabbit mAb	W, IF-IC, F	H, M, R
#3439 Notch1 (C37C7) Rabbit mAb	W, IP	H
#3268 Notch1 (C44H11) Rabbit mAb	W	H, (M, R)
#3447 Notch1 (5B5) Rat mAb	W, IP	H, M, R, B
NEW #4530 Notch2 (D67C8) XP® Rabbit mAb	W, IP, IF-IC	H, R
NEW #5732 Notch2 (D76A6) XP® Rabbit mAb	W, IP, IF-IC, F	H, M, R
#2420 Notch2 (8A1) Rabbit mAb	W, IP	H
#4744 SSEA1 (MC480) Mouse mAb	IHC-P, IF-IC, F	M

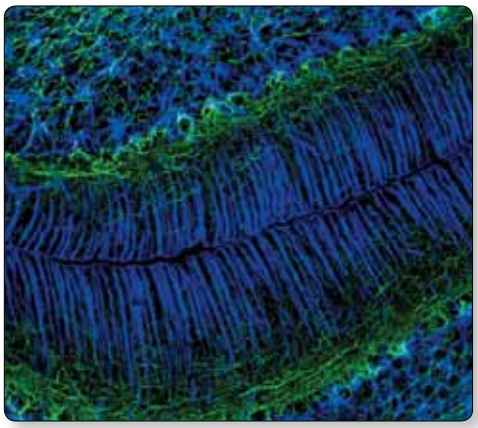
APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

Glial Lineage

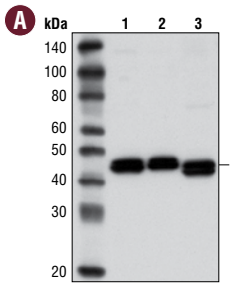
	Applications	Reactivity
Glial Progenitor		
#9597 FABP7 Antibody	W	H, R, (Mk)
#3471 Phospho-FGF Receptor (Tyr653/654) Antibody	W	H, (M, R)
#3476 Phospho-FGF Receptor (Tyr653/654) (55H2) Mouse mAb	W	H, (M, R)
#2544 Phospho-FGF Receptor 1 (Tyr766) (1E5) Rabbit mAb	W	H
#3472 FGF Receptor 1 Antibody	W, IP	H, (M, R)
#4574 FGF Receptor 3 (C51F2) Rabbit mAb	W, IP, IHC-P, IF-IC	H
#3163 FGF Receptor 3 (D2G7E) Rabbit mAb	W, IP	H, M
#3160 FGF Receptor 3 Antibody	W	H, M
#2894 FGF Receptor 4 Antibody	W	M, (H)
#3670 GFAP (GA5) Mouse mAb	W, IHC-P, IF-F	H, M, R
#3655 GFAP (GA5) Mouse mAb (Alexa Fluor® 488 Conjugate)	IF-F	H, M, R
#3656 GFAP (GA5) Mouse mAb (Alexa Fluor® 555 Conjugate)	IF-F	H, M, R
#3657 GFAP (GA5) Mouse mAb (Alexa Fluor® 647 Conjugate)	IF-F	H, M, R
#4760 Nestin (Rat-401) Mouse mAb	IHC-P, IF-F	R
Astrocyte		
#3471 Phospho-FGF Receptor (Tyr653/654) Antibody	W	H, (M, R)
#3476 Phospho-FGF Receptor (Tyr653/654) (55H2) Mouse mAb	W	H, (M, R)
#4574 FGF Receptor 3 (C51F2) Rabbit mAb	W, IP, IHC-P, IF-IC	H
#3163 FGF Receptor 3 (D2G7E) Rabbit mAb	W, IP	H, M
#3160 FGF Receptor 3 Antibody	W	H, M
#2808 Survivin (71G4B7) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC F	H, M, R
#2810 Survivin (71G4B7) Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-IC F	H, M, R
#4580 Survivin (71G4B7) Rabbit mAb (Alexa Fluor® 555 Conjugate)	IF-IC	H, M, R
#2866 Survivin (71G4B7) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R
#4037 Survivin (71G4B7) Rabbit mAb (Biotinylated)	W, F	H, M, R
#3947 Survivin (71G4B7) Rabbit mAb (Sepharose Bead Conjugate)	IP	H, M, R
#2803 Survivin Antibody	W, IP	H
#2802 Survivin (6E4) Mouse mAb	W	H, Mk
Oligodendrocyte		
#3570 CD44 (156-3C11) Mouse mAb	W, IP, IHC-P, IF-IC, F	H
#3516 CD44 (156-3C11) Mouse mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H
#4041 CD44 (156-3C11) Mouse mAb (Biotinylated)	W, F	H
#8724 CD44 (156-3C11) Mouse mAb (PE Conjugate)	F	H
#3578 CD44 Antibody	W	H
#5640 CD44 (8E2) Mouse mAb	W, IP, IF-IC, F	H, M, R
NEW **#5664 CNPase (D83E10) XP® Rabbit mAb**	W, IP, IF-F	H, M, R
NEW **#5714 CNPase (D83E10) XP® Rabbit mAb (Alexa Fluor® 488 Conjugate)**	IF-F	H, M, R
NEW **#5715 CNPase (D83E10) XP® Rabbit mAb (Alexa Fluor® 555 Conjugate)**	IF-F	H, M, R
NEW **#5716 CNPase (D83E10) XP® Rabbit mAb (Alexa Fluor® 647 Conjugate)**	IF-F	H, M, R
#2986 CNPase Antibody	W	H, M, R
#3493 RIP (D94C12) XP® Rabbit mAb	W, IP, IF-IC, F	H, M, R, Hm, Mk
#4926 RIP Antibody	W	H, Mk



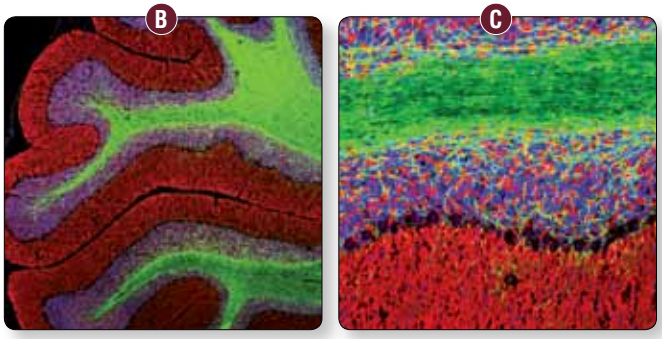
Nestin (Rat-401) Mouse mAb #4760: Confocal IF analysis of P1 rat cerebellum using #4760 (green) and Neurofilament-L (C28E10) Rabbit mAb #2837 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



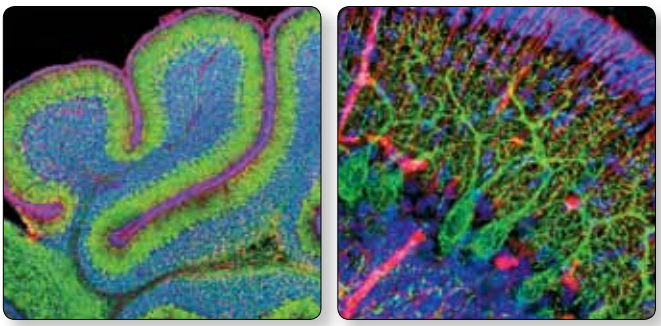
GFAP (GA5) Mouse mAb (Alexa Fluor® 647 Conjugate) #3657: Confocal IF analysis of rat cerebellum using #3657 (blue pseudocolor) and Neurofilament-L (DA2) Mouse mAb #2835 (green).



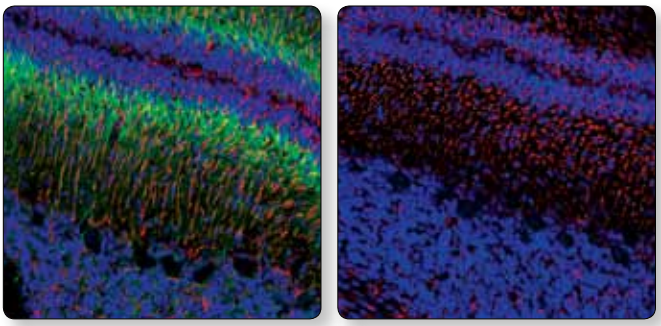
CNPase (D83E10) XP® Rabbit mAb #5664: WB analysis of extracts from mouse brain (lane 1), rat brain (lane 2), and human brain (lane 3) **(A)** using #5664. Confocal IF analysis of rat cerebellum **(B,C)** using #5664 (green) and α/β-Synuclein (Syn205) Mouse mAb #2644 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



Neural Lineage Markers, cont.



CEND1 Antibody #9894: Confocal IF analysis of P14 rat cerebellum using #9894 (green) and Nestin (Rat-401) Mouse mAb #4760 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



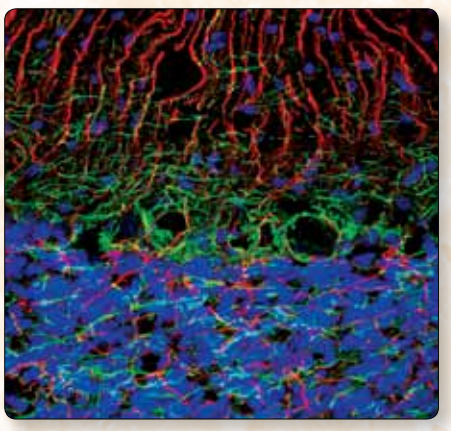
Phospho-Doublecortin (Ser334) Antibody #3453: Confocal IF analysis of P14 rat cerebellum, untreated (left) or λ phosphatase-treated (right), using #3453 (green) and GFAP (GA5) Mouse mAb #3670 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

Neuronal Lineage

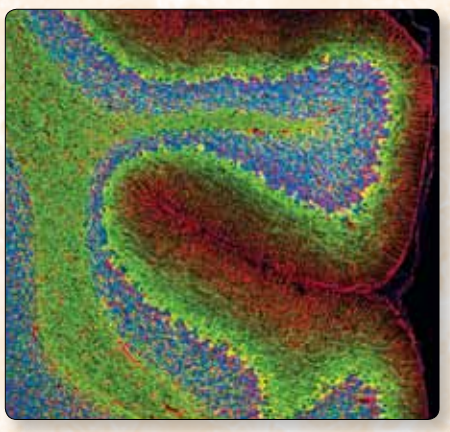
	Applications	Reactivity
Neuron Progenitor		
#9894 CEND1 Antibody	W, IF-F	H, M, R
#4541 Phospho-MAP2 (Ser136) Antibody	W, IF-F	H, R, Mk, (M)
#4544 Phospho-MAP2 (Thr1620/1623) Antibody	W	H, R, (M)
#4542 MAP2 Antibody	W, IF-F, IF-IC	H, M, R, Mk
#2274 MELK Antibody	W, IP	H, M, Dm
#4760 Nestin (Rat-401) Mouse mAb	IHC-P, IF-F	R
#5666 β3-Tubulin (D65A4) XP® Rabbit mAb	W, IP, IHC-P	H, M, R
#5568 β3-Tubulin (D71G9) XP® Rabbit mAb	W, IP, IF-F	H, M, R
#4466 β3-Tubulin (TU-20) Mouse mAb	W, IHC-P, IF-F	H, M, R
Neuron		
#4061 N-Cadherin Antibody	W	H, M, R, Mk
#3731 Caspr2 Antibody	W	H, M, R
#3606 NCAM (CD56) Antibody	W	H, M, R
#3576 CD56 (NCAM) (123C3) Mouse mAb	W, IHC-P, F	H
#9397 Phospho-CRMP-2 (Thr514) Antibody	W	H, M, R
#9393 CRMP-2 Antibody	W, IF-IC	H, M, R
#4605 Phospho-Doublecortin (Ser297) Antibody	W	H, R, (M)
#3453 Phospho-Doublecortin (Ser334) Antibody	W, IP, IF-F	H, M, R
#4604 Doublecortin Antibody	W, IP, IF-F, F	H, M, R, Mk, Dm
#3835 GABA(B)R1 Antibody	W, IP	H, M, R
#4819 GABA(B)R2 (C44A4) Rabbit mAb	W	H, M, R
#3839 GABA(B)R2 Antibody	W, IP	H, M, R
NEW **#8945 GAP43 (D9C8) XP® Rabbit mAb**	W, IP, IF-F	H, M, R
#5307 GAP43 Antibody	W	H, M, R
NEW **#8084 Phospho-AMPA Receptor (GluR 1) (Ser845) (D10G5) Rabbit mAb**	W, IP	H, M, R
#3921 Phospho-AMPA Receptor (GluR 2) (Tyr869/Tyr873/Tyr876) Antibody	W	R, (H, M)

Neurofilament-L

The cytoskeleton consists of three types of cytosolic fibers: actin microfilaments, intermediate filaments, and microtubules. Neurofilaments are the major intermediate filaments found in neurons and consist of light (NFL), medium (NFM), and heavy (NFH) subunits. Similar in structure to other intermediate filament proteins, neurofilaments have a globular amino-terminal head, a central α-helical rod domain, and a carboxy-terminal tail. A heterotetrameric unit (NFL-NFM and NFL-NFH) forms a protofilament, with eight protofilaments comprising the typical 10 nm intermediate filament. While neurofilaments are critical for radial axon growth and determine axon caliber, microtubules are involved in axon elongation. PKA phosphorylates the head domain of NFL and NFM to inhibit neurofilament assembly. Neurofilament accumulations are found in many human neurological disorders, including Parkinson's disease (in Lewy bodies along with α-synuclein), Alzheimer's disease, Charcot-Marie-Tooth disease, and Amyotrophic Lateral Sclerosis (ALS).



Neurofilament-L (C28E10) Rabbit mAb #2837: Confocal IF analysis of rat cerebellum using #2837 (green) and GFAP (GA5) Mouse mAb #3670 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

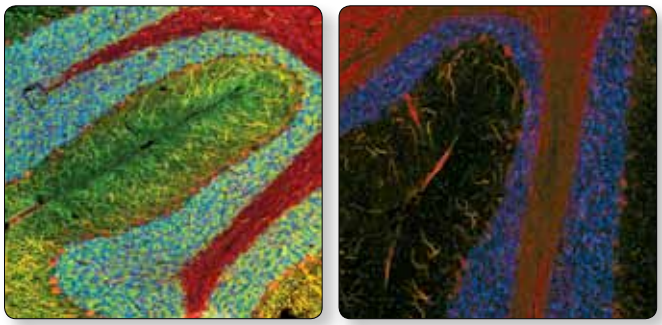


Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 488 Conjugate) #8024: Confocal IF analysis of rat cerebellum using #8024 (green) and GFAP (GA5) Mouse mAb #3670 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

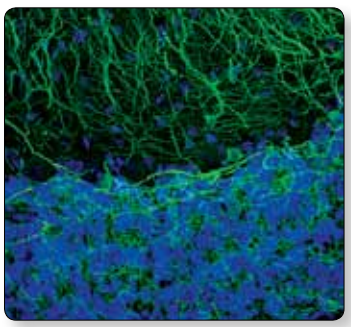
APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

Neuronal Lineage

		Applications	Reactivity
	#4027 Phospho-AMPA Receptor (GluR 2) (Tyr876) Antibody	W	R, (H, M)
NEW	#5306 AMPA Receptor (GluR 2) (D39F2) Rabbit mAb	W	H, M, R
NEW	#8070 AMPA Receptor (GluR 4) (D41A11) XP® Rabbit mAb	W, IP, IF-F	H, M, R
NEW	#8010 AMPA Receptor (GluR 4) (D19G9) Rabbit mAb	W, IP	H, M, R
	#3824 AMPA Receptor (GluR 4) (Ala60) Antibody	W	M, R, (H)
	#3825 AMPA Receptor (GluR 4) (Arg860) Antibody	W, IP	H, M, R
	#2155 Jagged1 (1C4) Rabbit mAb	W	H
	#2620 Jagged1 (28H8) Rabbit mAb	W, IP	H, (M, R)
	#4541 Phospho-MAP2 (Ser136) Antibody	W, IF-F	H, R, Mk, (M)
	#4544 Phospho-MAP2 (Thr1620/1623) Antibody	W	H, R, (M)
	#4542 MAP2 Antibody	W, IF-F, IF-IC	H, M, R, Mk
NEW	#6921 Mena (D33C1) Rabbit mAb	W, IP	H, M, R
	#2075 Mena Antibody	W	H, M, R
	#5310 mGluR1 Antibody	W, IP	H, M, R
	#4760 Nestin (Rat-401) Mouse mAb	IHC-P, IF-F	R
	#2836 Neurofilament-H (RMdO 20) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
	#2837 Neurofilament-L (C28E10) Rabbit mAb	W, IHC-P, IF-F	H, M, R
NEW	#8024 Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-F	H, M, R
NEW	#8039 Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 555 Conjugate)	IF-F	H, M, R
NEW	#8590 Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 647 Conjugate)	IF-F	H, M, R
	#2835 Neurofilament-L (DA2) Mouse mAb	W, IHC-P, IF-F	H, M, R
	#2838 Neurofilament-M (RMO 14.9) Mouse mAb	W, IP, IHC-P, IF-IC	H, M, R
	#3725 Neuropilin-1 (D62C6) XP® Rabbit mAb	W, IP	H, M
	#3366 Neuropilin-2 (D39A5) XP® Rabbit mAb	W, IP, IHC-P, IF-F	M, R
	#5665 Nicastrin (D38F9) Rabbit mAb	W	H, M, R, Hm, Mk
	#3632 Nicastrin Antibody	W	H, M, R, Mk



Phospho-MAP2 (Ser136) Antibody #4541: Confocal IF analysis of rat cerebellum, untreated (left) or λ-phosphatase treated (right), using #4541 (green) and β3-Tubulin (TU-20) Mouse mAb #4466 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



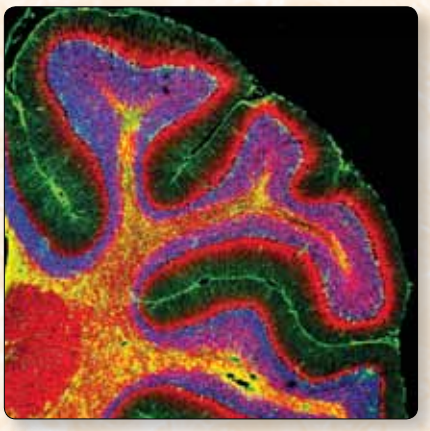
MAP2 Antibody #4542: Confocal IF analysis of rat cerebellum using #4542 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

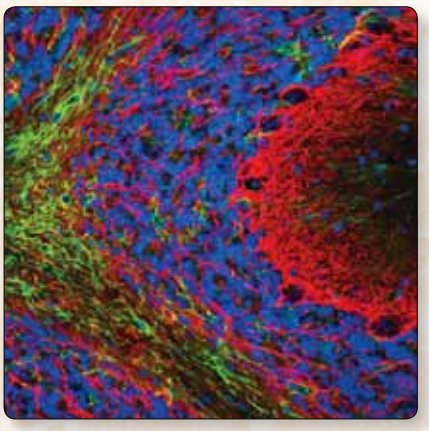
Application References:

GFAP (GA5) Mouse mAb #3670: Davies, J.E. et al. (2008) *J. Biol.* 7, 24. (IF-IC)

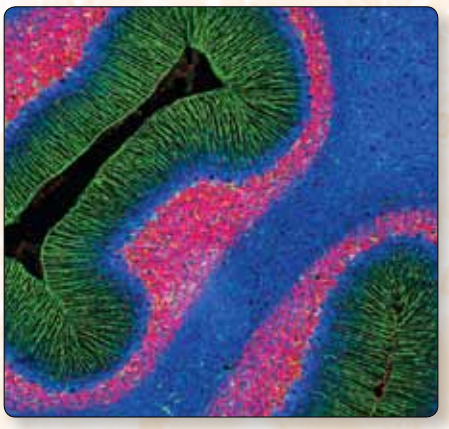
Musashi Antibody #2154: Shiras, A. et al. (2007) *Stem Cells* 25, 1478-1489. (IF-IC) / Longshore, S.W. et al. (2009) *J. Pediatr. Surg.* 44, 1065–1071. (W)

Neurofilament-M (RMO 14.9) Mouse mAb #2838: Gabanella, F. et al. (2005) *Hum. Mol. Genet.* 14, 3629–3642. (W)





Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 555 Conjugate) #8039: Confocal IF analysis of rat cerebellum using #8039 (red) and GFAP (GA5) Mouse mAb #3670 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

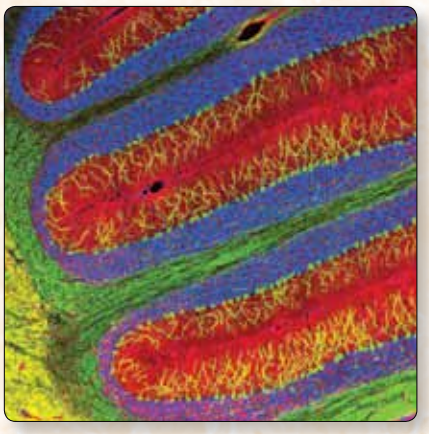


Neurofilament-L (C28E10) Rabbit mAb (Alexa Fluor® 647 Conjugate) #8590: Confocal IF analysis of normal rat cerebellum using #8590 (blue) and GFAP (GA5) Mouse mAb #3670 (green). Red = Propidium Iodide/RNase #4087 (fluorescent DNA dye).

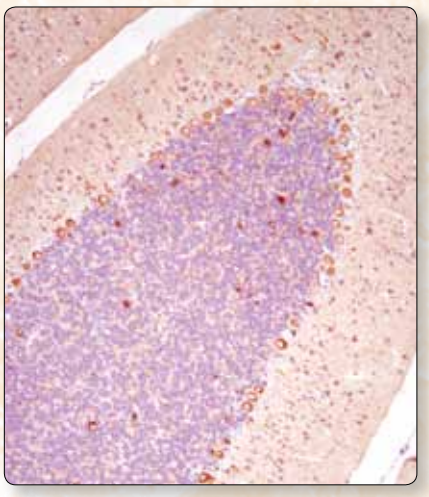
Neural Lineage Markers, cont.

β3-Tubulin

The cytoskeleton consists of three types of cytosolic fibers: microtubules, microfilaments (actin filaments), and intermediate filaments. Globular tubulin subunits comprise the microtubule building block, with α/β-tubulin heterodimers forming the tubulin subunit common to all eukaryotic cells. Neuronal marker β3-tubulin has been implicated as a critical regulator of axon guidance and maintenance, and is overexpressed in many tumors. Mutations in β3-tubulin are associated with congenital fibrosis of extraocular muscles type 3A, a disorder characterized by ophthalmoplegia (inability to move eyes) and ptosis (eyelid drooping).



β3-Tubulin (D71G9) XP® Rabbit mAb #5568: Confocal IF analysis of mouse cerebellum using #5568 (green) and Tau (Tau46) Mouse mAb #4019 (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



β3-Tubulin (D65A4) XP® Rabbit mAb #5666: IHC analysis of paraffin-embedded rat cerebellum using #5666.

Neuronal Lineage	Applications	Reactivity
#3813 Plexin A1 Antibody	W, IP, IHC-P	H, R, (M)
NEW #5658 Plexin A2 (D42B5) Rabbit mAb	W, IP	H, M, R
NEW #6896 Plexin A2 (D44D4) Rabbit mAb	W	H, M, R
#3994 Plexin A2 Antibody	W, IP	H, M, R
#5512 Plexin A3 (D2G12) Rabbit mAb	W, IP	H
#3816 Plexin A4 (C5D1) Rabbit mAb	W, IP	M, R, (H)
#3919 Phospho-PSD95 (Tyr236/Tyr240) Antibody	W	R, (H, M)
#3450 PSD95 (D27E11) XP® Rabbit mAb	W, IF-F	H, M, R
#3409 PSD95 (D74D3) XP® Rabbit mAb	W, IHC-P	H, M, R
#2507 PSD95 Antibody	W, IP, IF-F	H, M, R
NEW #5622 Phospho-Semaphorin 4B (Ser825) Antibody	W	H, M, R
#3355 Semaphorin 4B Antibody	W	H
#3353 Phospho-Stathmin (Ser16) Antibody	W	H, M, R, Hm, Mk
NEW #4191 Phospho-Stathmin (Ser38) (D19H10) Rabbit mAb	W, IP, IHC-P, IF-IC	H, Mk
#3426 Phospho-Stathmin (Ser38) Antibody	W	H, M, R, (Mk)
#3352 Stathmin Antibody	W, IHC-P	H, M, R, Mk
#4265 STOP (175) Mouse mAb	W, IF-F	H, M, R
#2311 Phospho-Synapsin (Ser9) Antibody	W	H, M, R
#5297 Synapsin-1 (D12G5) XP® Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
NEW #6710 Synapsin-1 (D13C1) Rabbit mAb	W, IP	H, M, R
#2312 Synapsin Antibody	W	M, R, (H)
#5461 Synaptophysin (D35E4) XP® Rabbit mAb	W, IP, IF-F	H, M, R
#5467 Synaptophysin (D40C4) Rabbit mAb	W, IP	H, M, R
#4329 Synaptophysin Antibody	W	H, M, R
#2869 Syntaxin 6 (C34B2) Rabbit mAb	W, IP, IF-IC	H, M, R, Mk
#2417 Syntaxin 6 Antibody	W, IP	H, M, R, Mk
#4179 α-Synuclein (D37A6) XP® Rabbit mAb	W, IP, IHC-P, IF-F	M, R
#2642 α-Synuclein Antibody	W, IP	H, M, R, Mk
#2628 α-Synuclein Antibody (IF Preferred)	W, IF-F	H, M, R
#2647 α-Synuclein (Syn204) Mouse mAb	W, IHC-P, IF-P	H
#2644 α/β-Synuclein (Syn205) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
#9632 Phospho-Tau (Ser396) (PHF13) Mouse mAb	W	M, R, (H)
#4019 Tau (Tau46) Mouse mAb	W, IHC-P, IF-F, IF-P	H, M, R, (B)
NEW #9798 Thy1 Antibody	W, IP	H, M, R
#4603 TrkB (80E3) Rabbit mAb	W	H, M, R
#4607 TrkB (80G2) Rabbit mAb	IHC-P, F	H (M, R)
#4606 TrkB Antibody	W	H
NEW #5666 β3-Tubulin (D65A4) XP® Rabbit mAb	W, IP, IHC-P	H, M, R
#5568 β3-Tubulin (D71G9) XP® Rabbit mAb	W, IP, IF-F	H, M, R
#4466 β3-Tubulin (TU-20) Mouse mAb	W, IHC-P, IF-F	H, M, R
#3370 Phospho-Tyrosine Hydroxylase (Ser31) Antibody	W, IP	R, (M)
#2791 Phospho-Tyrosine Hydroxylase (Ser40) Antibody	W, IF-IC	R, (H, M)
#2792 Tyrosine Hydroxylase Antibody	W, IF-IC	H, M, R
NEW #5741 Vimentin (D21H3) XP® Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
NEW #9854 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H, M, R, Mk
NEW #9855 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 555 Conjugate)	IF-IC	H, M, R, Mk
NEW #9856 Vimentin (D21H3) XP® Rabbit mAb (Alexa Fluor® 647 Conjugate)	IF-IC, F	H, M, R, Mk
#3390 Vimentin (5G3F10) Mouse mAb	W	H, Mk
#3932 Vimentin (R28) Antibody	W, IF-IC	H, M, R, Mk

APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

Antibody Sampler Kits

Our Antibody Sampler Kits contain sample sizes of several antibodies directed against a protein, pathway, or cellular process of interest. Each kit contains enough primary antibody to perform four western blots with each antibody.

#9916 Phospho-Akt Pathway Antibody Sampler Kit
Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb #4060, Phospho-Akt (Thr308) (C31E5E) Rabbit mAb #2965, Akt (pan) (C67E7) Rabbit mAb #4691, Phospho-c-Raf (Ser259) Ab #9421, Phospho-GSK-3β (Ser9) (5B3) Rabbit mAb #9323, Phospho-PTEN (Ser380) Ab #9551, Phospho-PDK1 (Ser241) (C49H2) Rabbit mAb #3438, Anti-rabbit IgG, HRP-linked Ab #7074, LY294002 (PI3 Kinase Inhibitor) #9901

#9940 Akt Isoform Antibody Sampler Kit
Akt1 (C73H10) Rabbit mAb #2938, Akt2 (D6G4) Rabbit mAb #3063, Akt3 (62A8) Rabbit mAb #3788, Akt (pan) (C67E7) Rabbit mAb #4691, C2C12 cell extracts-Untreated, Anti-rabbit IgG, HRP-linked Ab #7074

#9784 Alzheimer Disease Antibody Sampler Kit
β-Amyloid Ab #2454, Neurofilament-L (C28E10) Rabbit mAb #2837, Tau (Tau46) Mouse mAb #4019, BACE (D10E5) Rabbit mAb #5606, APP/β-Amyloid (NAB228) Mouse mAb #2450, α-Synuclein (Syn204) Mouse mAb #2647, GSK-3α/β (D75D3) XP® Rabbit mAb #5676, Phospho-GSK-3α (Ser21) (36E9) Rabbit mAb #9316, Anti-rabbit IgG, HRP-linked Ab #7074, Anti-mouse IgG, HRP-linked Ab #7076

#9915 Apoptosis Antibody Sampler Kit
Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb #9664, Caspase-3 Ab #9662, PARP Ab #9542, Cleaved PARP (Asp214) (D64E10) XP® Rabbit mAb #5625, Caspase-9 Ab (Human Specific) #9502, Cleaved Caspase-9 (Asp330) Ab (Human Specific) #9501, Caspase-7 Ab #9492, Cleaved Caspase-7 (Asp198) Ab #9491, Anti-rabbit IgG, HRP-linked Ab #7074

#9930 Apoptosis Antibody Sampler Kit (Mouse Preferred)
Caspase-3 Ab #9662, Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb #9664, Cleaved Caspase-6 (Asp162) Ab #9761, Caspase-6 Ab #9762, Cleaved PARP (Asp214) Ab (Mouse Specific) #9544, Caspase-12 Ab #2202, Caspase-9 Ab (Mouse Specific) #9504, Cleaved Caspase-9 (Asp353) Ab (Mouse Specific) #9509, Anti-rabbit IgG, HRP-linked Ab #7074

#4445 Autophagy Antibody Sampler Kit
Beclin-1 (D40C5) Rabbit mAb #3495, LC3A (D50G8) XP® Rabbit mAb #4599, LC3B (D11) XP® Rabbit mAb #3868, Atg5 (D1G9) Rabbit mAb #8540, Atg12 (D88H11) Rabbit mAb #4180, Atg7 Ab #2631, Atg3 Ab #3415, Anti-rabbit IgG, HRP-linked Ab #7074

#9105 Phospho-Bad Antibody Sampler Kit
Bad (D24A9) Rabbit mAb #9239, Phospho-Bad (Ser112) (40A9) Rabbit mAb #5284, Phospho-Bad (Ser136) (185D10) Rabbit mAb #5286, Phospho-Bad (Ser155) Ab #9297, Anti-rabbit IgG, HRP-linked Ab #7074, pCMV-Tag4A-mBad/GrpE

#9942 Pro-Apoptosis Bcl-2 Family Antibody Sampler Kit
Bad (D24A9) Rabbit mAb #9239, Phospho-Bad (Ser112) (40A9) Rabbit mAb #5284, Bax (D2E11) Rabbit mAb #5023, Bik Ab #4592, Bim (C34C5) Rabbit mAb #2933, BID Ab (Human Specific) #2002, Bak (D2D3) Rabbit mAb #6947, Puma Ab #4976, Anti-rabbit IgG, HRP-linked Ab #7074

#9941 Pro-Survival Bcl-2 Family Antibody Sampler Kit
Phospho-Bcl-2 (Ser70) (5H2) Rabbit mAb #2827, Phospho-Bcl-2 (Thr56) Ab (Human Specific) #2875, Bcl-2 (50E3) Rabbit mAb #2870, Bcl-xL (54H6) Rabbit mAb #2764, Mcl-1 (D35A5) Rabbit mAb #5453, Anti-rabbit IgG, HRP-linked Ab #7074

#9929 Cleaved Caspase Antibody Sampler Kit
Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb #9664, Cleaved Caspase-6 (Asp162) Ab #9761, Cleaved Caspase-7 (Asp198) Ab #9491, Cleaved Caspase-9 (Asp330) Ab (Human Specific) #9501, Cleaved Caspase-9 (Asp315) Ab (Human Specific) #9505, Cleaved PARP (Asp214) (D64E10) XP® Rabbit mAb #5625, Anti-rabbit IgG, HRP-linked Ab #7074

#9369 GSK-3 Antibody Sampler Kit
GSK-3α (D80E6) Rabbit mAb #4337, Phospho-GSK-3β (Ser9) (5B3) Rabbit mAb #9323, Phospho-GSK-3α/β (Ser21/9) (37F11) Rabbit mAb (GSK-3α Preferred) #9327, GSK-3β (27C10) Rabbit mAb #9315, Phospho-GSK-3α (Ser21) (36E9) Rabbit mAb #9316, Anti-rabbit IgG, HRP-linked Ab #7074

#9781 Neurofilament Antibody Sampler Kit
Neurofilament-M (RMO 14.9) Mouse mAb #2838, Neurofilament-L (DA2) Mouse mAb #2835, Neurofilament-L (C28E10) Rabbit mAb #2837, Neurofilament-H (RMdO 20) Mouse mAb #2836, Anti-rabbit IgG, HRP-linked Ab #7074, Anti-mouse IgG, HRP-linked Ab #7076

#3640 Notch Isoform Antibody Sampler Kit
Cleaved Notch1 (Val1744) (D3B8) Rabbit mAb #4147, Notch1 (D6F11) XP® Rabbit mAb #4380, Notch2 (D67C8) XP® Rabbit mAb #4530, Notch3 (D11B8) Rabbit mAb #5276, Anti-rabbit IgG, HRP-linked Ab #7074

#9655 PI3 Kinase Antibody Sampler Kit
Phospho-PI3K p85 (Tyr458)/p55 (Tyr199) Ab #4228, PI3 Kinase p85 (19H8) Rabbit mAb #4257, PI3 Kinase p110α (C73F8) Rabbit mAb #4249, PI3 Kinase p110β (C33D4) Rabbit mAb #3011, PI3 Kinase Class III (D4E2) Rabbit mAb #3358, PI3 Kinase p110-γ (D55D5) Rabbit mAb #5405, Anti-rabbit IgG, HRP-linked Ab #7074

#9960 PKC Isoform Antibody Sampler Kit
PKCα Ab #2056, PKCδ Ab #2058, PKCζ (C24E6) Rabbit mAb #9368, PKD/PKCμ Ab #2052, Anti-rabbit IgG, HRP-linked Ab #7074

#9652 PTEN and PDK1 Antibody Sampler Kit
Phospho-PDK1 (Ser241) (C49H2) Rabbit mAb #3438, PDK1 Ab #3062, Phospho-PTEN (Ser380/Thr382/383) (44A7) Rabbit mAb #9549, Non-Phospho PTEN (Ser380/Thr382/Thr383) Ab #9569, PTEN (D4.3) XP® Rabbit mAb #9188, Anti-rabbit IgG, HRP-linked Ab #7074

#9385 Rab Family Antibody Sampler Kit
Rab4 Ab #2167, Rab5 (C8B1) Rabbit mAb #3547, Rab7 (D95F2) XP® Rabbit mAb #9367, Rab9 (D52G8) XP® Rabbit mAb #5118, Rab11 (D4F5) XP® Rabbit mAb #5589, Anti-rabbit IgG, HRP-linked Ab #7074

#5887 γ Secretase Antibody Sampler Kit
Nicastrin (D38F9) Rabbit mAb #5665, PEN2 Ab #5451, Presenilin 1 (D39D1) Rabbit mAb #5643, Presenilin 2 Ab #2192, Anti-rabbit IgG, HRP-linked Ab #7074

#4638 TrkA and TrkB Antibody Sampler Kit
Phospho-TrkA (Tyr490)/TrkB (Tyr516) (C35G9) Rabbit mAb #4619, Phospho-TrkA (Tyr674/675)/TrkB (Tyr706/707) (C50F3) Rabbit mAb #4621, TrkA (14G6) Rabbit mAb #2508, TrkB (80E3) Rabbit mAb #4603, Trk (pan) (C17F1) Rabbit mAb #4609, Anti-rabbit IgG, HRP-linked Ab #7074

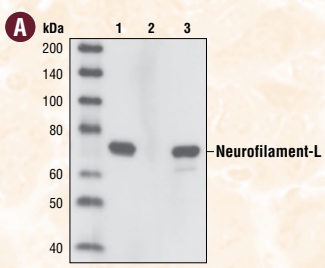
Alzheimer Disease Antibody Sampler Kit #9784

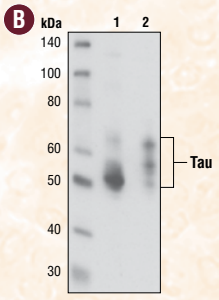
This kit offers an economical means of evaluating Alzheimer disease-related signaling.

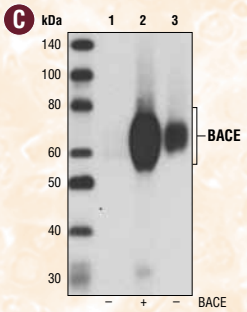
(A) Neurofilament-L (C28E10) Rabbit mAb #2837: WB analysis of extracts from mouse brain (lane 1), HeLa cells (lane 2), and rat brain (lane 3) using #2837.

(B) Tau (Tau46) Mouse mAb #4019: WB analysis of extracts from mouse brain (lane 1) and rat brain (lane 2) using #4019.

(C) BACE (D10E5) Rabbit mAb #5606: WB analysis of extracts from HeLa cells, untransfected (lane 1) and BACE transfected (lanes 2), and rat brain (lane 3) using #5606.





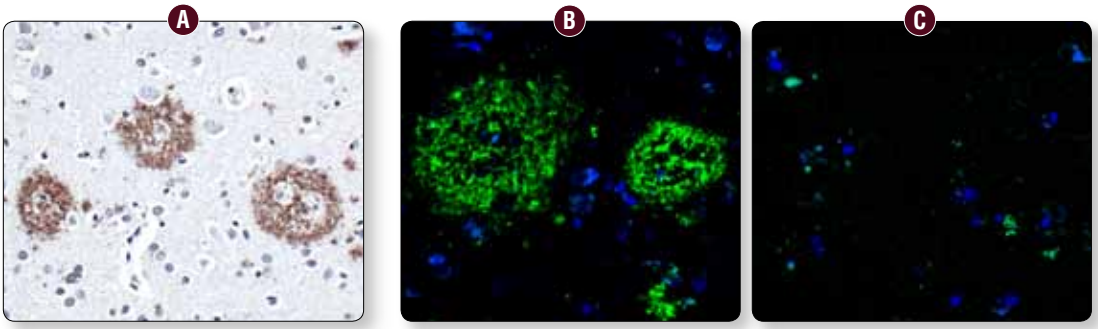


Unparalleled Product Quality, Validation, and Technical Support

Neurodegenerative Disease

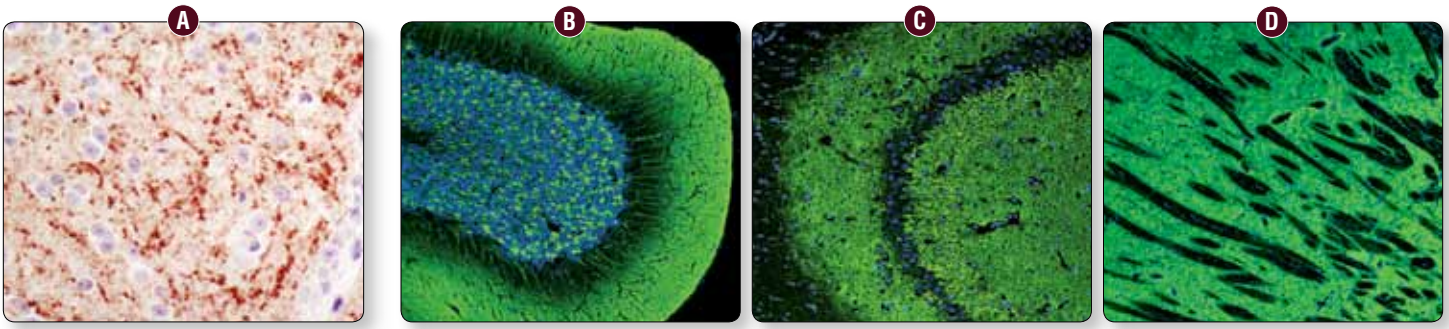
		Applications	Reactivity
NEW	#6986 Phospho-APP (Thr668) (D90B8) Rabbit mAb	W, IP	H, M, R
	#3823 Phospho-APP (Thr668) Antibody	W, IP, IF-IC	H, (M, R)
	#2452 APP Antibody	W, IF-IC	H, M, R, Mk
	#2450 APP/β-Amyloid (NAB228) Mouse mAb	W, IHC-P, IF-P	H, Mk, B, (Pg, Dg)
	#2454 β-Amyloid Antibody	W, IHC-P, IF-P	H
	#2177 Ataxin-1 Antibody	W	H, M, R, Dm
	#5606 BACE (D10E5) Rabbit mAb	W, IP	H, M, R
	#2556 Calpain 1 Large Subunit (Mu-type) Antibody	W, IF-F	H, M, R
	#2539 Calpain 2 Large Subunit (M-type) Antibody	W, IP, IF-F, F	H, M, R
	#2506 CDK5 Antibody	W, IP	H, M, R
	#5560 DJ-1 (D21E11) Rabbit mAb	W, IP	H
	#2134 DJ-1 Antibody	W, F	H, M, R
NEW	#5556 DLST Antibody	W, IP	H, M, R, Mk
	#2877 FE65 Antibody	W	M, R, (H)
NEW	#8068 Cleaved GGA3 (Asp313) (D16H3) Rabbit mAb	W, IP	H, Mk
NEW	#8027 GGA3 (D66F1) Rabbit mAb	W, IP	H, M, R
	#4167 GGA3 Antibody	W, IP	H, M, R
NEW	#3369 GSTP1 (3F2) Mouse mAb	W, IHC-P, IF-IC	H, Mk
NEW	#8226 HIP2 (D27C4) Rabbit mAb	W, IP	H, M, R, Mk, (B)
NEW	#5656 Huntingtin (D7F7) XP® Rabbit mAb	W, IP, IF-F	H, M, R
	#2773 Huntingtin Antibody	W, IP, IF-F	H, M, R
	#5559 LRRK2 Antibody	W, IP	H, M, R
	#2567 LRRK2 Antibody	W	H
	#5665 Nicastrin (D38F9) Rabbit mAb	W	H, M, R, Hm, Mk

		Applications	Reactivity
	#3632 Nicastrin Antibody	W	H, M, R, Mk
	#2680 p35/25 (C64B10) Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
	#3275 p39 Antibody	W	H, M, R
NEW	#5879 PARK9 Antibody	W, IP	H, M, R, Mk
	#2132 Parkin Antibody	W	H, M, R
	#4211 Parkin (Park8) Mouse mAb	W, IP	H, M, R
NEW	#5451 PEN2 Antibody	W	H, M, R, Mk
NEW	#5660 PINK1 (N4/15.11) Mouse mAb	W, IP	H
NEW	#5643 Presenilin 1 (D39D1) Rabbit mAb	W, IP	H, M, R, Mk
	#3622 Presenilin 1 Antibody	W, IP	H, R, Mk, (M)
NEW	#9979 Presenilin 2 (D30G3) Rabbit mAb	W, IP	H, M, R
	#2192 Presenilin 2 Antibody	W, IP	H, M, R, Mk
	#2770 SOD1 Antibody	W, F	H
	#4266 SOD1 (71G8) Mouse mAb	W, IP	H
	#4179 α-Synuclein (D37A6) XP® Rabbit mAb	W, IP, IHC-P, IF-F	M, R
	#2642 α-Synuclein Antibody	W, IP	H, M, R, Mk
	#2628 α-Synuclein Antibody (IF Preferred)	W, IF-F	H, M, R
	#2647 α-Synuclein (Syn204) Mouse mAb	W, IHC-P, IF-P	H
	#2644 α/β-Synuclein (Syn205) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
	#9632 Phospho-Tau (Ser396) (PHF13) Mouse mAb	W	M, R, (H)
	#4019 Tau (Tau46) Mouse mAb	W, IHC-P, IF-F, IF-P	H, M, R, (B)
	#3449 TDP43 (A260) Antibody	W, IF-IC	H, M, R
	#3448 TDP43 (G400) Antibody	W, IP, IF-IC	H, M, R
	#2076 TMP21 Antibody	W	H, M, Mk, (R)
	#2150 TorsinA (D-M2A8) Mouse mAb	W	H, M, R



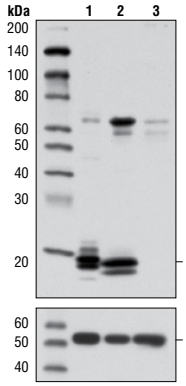
Unparalleled Product Quality, Validation, and Technical Support

APP/β-Amyloid (NAB228) Mouse mAb #2450: IHC analysis of paraffin-embedded human Alzheimer's brain **(A)** using #2450. Confocal IF analysis of paraffin-embedded human Alzheimer's brain **(B)** and normal human brain **(C)** using #2450 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

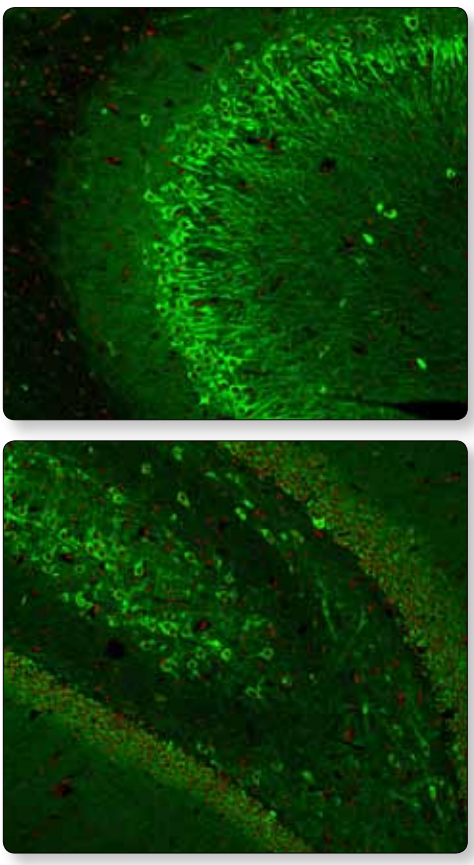


α-Synuclein (D37A6) XP® Rabbit mAb #4179: IHC analysis of paraffin-embedded mouse brain **(A)** using #4179. Confocal IF analysis of normal rat cerebellum **(B)**, hippocampus **(C)**, and striatum **(D)** using #4179 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA



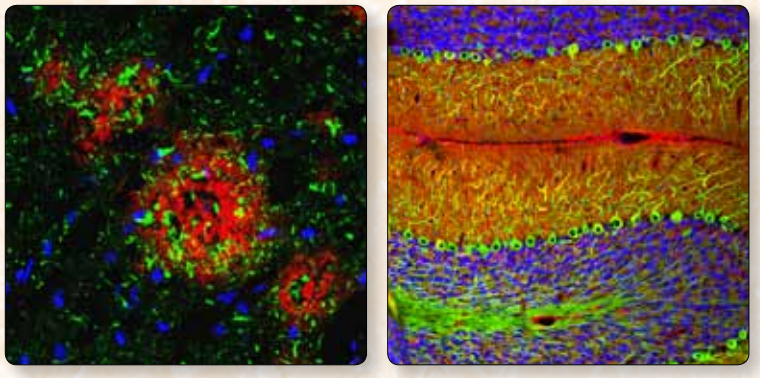
Presenilin 1 (D39D1) Rabbit mAb #5643: WB analysis of extracts from HeLa (lane 1), wild-type MEF (lane 2), and Presenilin 1(-/-) MEF (lane 3) cells using #5643 (upper) and α/β-Tubulin Antibody #2148 (lower). (Wild-type MEF and Presenilin 1(-/-) MEF cells were kindly provided by Dr. Bart De Strooper, K.U.Leuven, Belgium.)



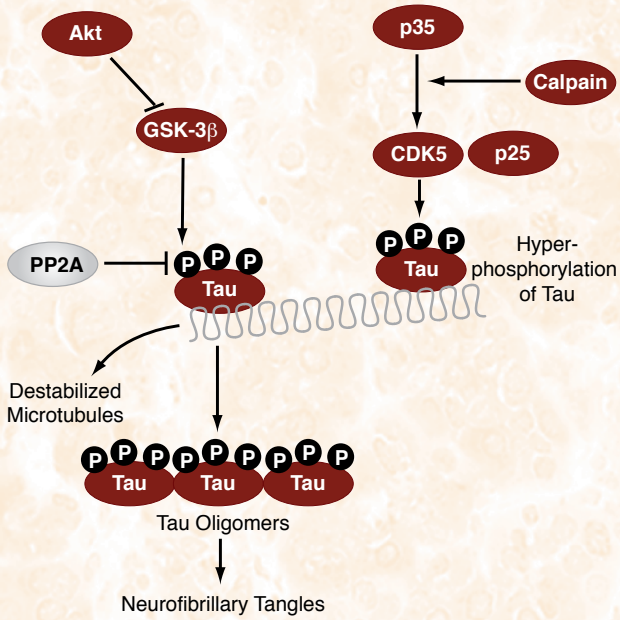
Huntingtin (D7F7) XP® Rabbit mAb #5656: Confocal IF analysis of rat hippocampus using #5656 (green). Red = Propidium Iodide/RNase #4087 (fluorescent DNA dye).

Tau

Neurofibrillary tangles are one of the hallmarks of Alzheimer's disease. These tangles are bundles of paired helical filaments composed of hyperphosphorylated Tau protein. Phosphorylation of Tau by GSK-3, CDK5, and other kinases results in dissociation of Tau from the microtubule, leading to the microtubule destabilization and oligomerization of Tau protein. Neurofibrillary tangles form as a result of Tau oligomerization and lead to apoptosis of the neuron.



Tau (Tau46) Mouse mAb #4019: Confocal IF analysis of human Alzheimer's brain (left) using #4019 (green) and β-Amyloid Antibody #2454 (red), and rat cerebellum (right) using #4019 (red) and β3-Tubulin (D71G9) XP® Rabbit mAb #5568 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



Application References:

APP Antibody #2452: Muresan, Z. and Muresan, V. (2005) *J. Neurosci.* 25, 3741–3751. (W, IF-IC) / Sontag, E. et al. (2007) *J. Neurosci.* 27, 2751–2759. (W)

β-Amyloid Antibody #2454: Saiz-Sanchez, D. et al. (2010) *Exp. Neurol.* 223, 347–350. (IF-P)

APP/β-Amyloid (NAB228) Mouse mAb #2450: Lee, E.B. et al. (2006) *J. Biol. Chem.* 281, 4292–4299. (W) / Lee, E.B. et al. (2005) *J. Cell. Biol.* 168, 291–302. (W, IHC) / Lee, M.S. et al. (2003) *J. Biol. Chem.* 163, 83–95. (W) / Lee, E.B. et al. (2003) *J. Biol. Chem.* 278, 4458–4466. (W)

DJ-1 Antibody #2134: Liu, Y. et al. (2010) *Cell Biochem. Funct.* 28, 578–584. (W)

Parkin (Prk8) Mouse mAb #4211: Pawlyk, A.C. et al. (2003) *J. Biol. Chem.* 278, 48120–48728. (W, IP) / von Coelln, R. et al. (2006) *J. Neurosci.* 26, 3685–3696. (W)

α-Synuclein Antibody #2642: Liang, T. et al. (2003) *Proc. Natl. Acad. Sci. USA* 100, 4690–4695. (W)

α-Synuclein (Syn204) Mouse mAb #2647: Pan, Z.Z. et al. (2002) *J. Biol. Chem.* 277, 35050–35060. (W)

Tau (Tau46) Mouse mAb #4019: Horiguchi, T. et al. (2003) *Am. J. Pathol.* 163, 1021–1031. (W) / Saiz-Sanchez, D. et al. (2010) *Exp. Neurol.* 223, 347–350. (IF-P)

TorsinA (D-M2A8) Mouse mAb #2150: Sharma, N. et al. (2005) *J. Neurosci.* 25, 5351–5355. (W) / Kamm, C. et al. (2004) *J. Biol. Chem.* 279, 19882–19892. (W)

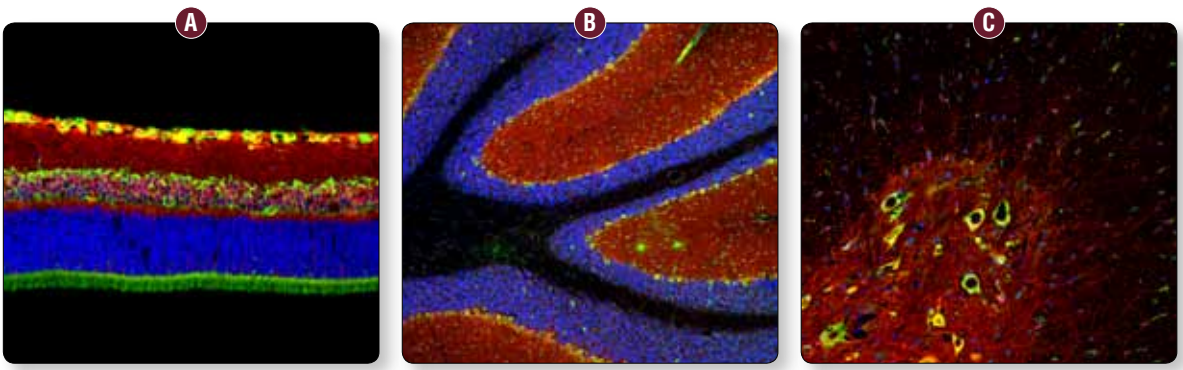
Akt and GSK-3

Akt

		Applications	Reactivity
	#4056 Phospho-Akt (Thr308) (244F9) Rabbit mAb	W, IP	H, M, R, Mk
	#2965 Phospho-Akt (Thr308) (C31E5E) Rabbit mAb	W, IF-IC, F	H, M, R, Hm, Mk
	#2918 Phospho-Akt (Thr308) (C31E5E) Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R, Hm, Mk
	#3375 Phospho-Akt (Thr308) (C31E5E) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R, Hm, Mk
NEW	#5056 Phospho-Akt (Thr308) (C31E5E) Rabbit mAb (Biotinylated)	W	H, M, R, Hm, Mk
	#9275 Phospho-Akt (Thr308) Antibody	W, IP, F	H, M, R, Hm
	#5106 Phospho-Akt (Thr308) (L32A4) Mouse mAb	W	H, M, R, Mk
	#9267 Phospho-Akt (Thr450) Antibody	W, IP	H, M, R
	#4060 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
	#4071 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
	#4075 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
	#5012 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (Biotinylated)	W, F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
NEW	#5171 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (HRP Conjugate)	W	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
NEW	#5315 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (PE Conjugate)	F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
NEW	#4070 Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb (Sepharose Bead Conjugate)	IP	H, M, R, Hm, Dm, Z, B, (Mk, C, Dg)
	#4058 Phospho-Akt (Ser473) (193H12) Rabbit mAb	W, IP, IF-IC, F	H, M, R
	#2336 Phospho-Akt (Ser473) (193H12) Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R

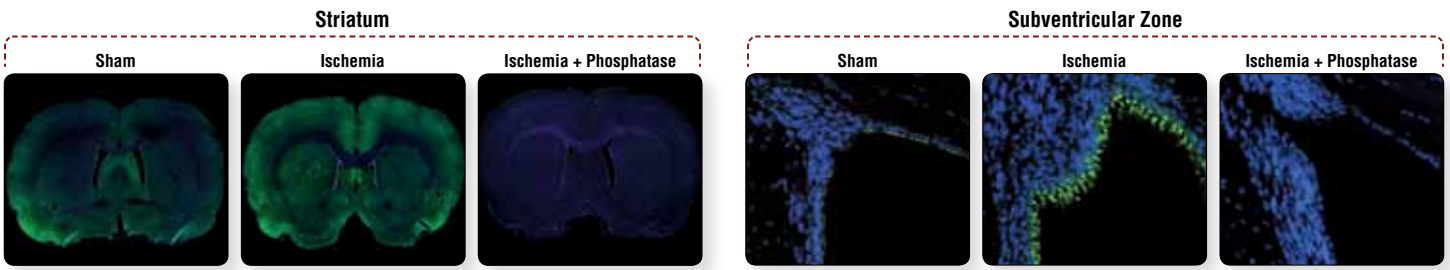
Akt

		Applications	Reactivity
	#2337 Phospho-Akt (Ser473) (193H12) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R
	#3787 Phospho-Akt (Ser473) (736E11) Rabbit mAb	IHC-P, IHC-F	H, M, (R)
	#9271 Phospho-Akt (Ser473) Antibody	W, IP, IF-IC, F	H, M, R, Hm, Dm, B, Dg, Pg, (Mk, C, X)
	#4051 Phospho-Akt (Ser473) (587F11) Mouse mAb	W, IP	H, M, R, Hm, (Mk)
	#5102 Phospho-Akt (Ser473) (587F11) Mouse mAb (Biotinylated)	IP	H, M, (R, Hm)
	#4054 Phospho-Drosophila Akt (Ser505) Antibody	W	Dm
	#4685 Akt (pan) (11E7) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
	#4691 Akt (pan) (C67E7) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Dm
	#5084 Akt (pan) (C67E7) Rabbit mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H, M, R, Mk, Dm
NEW	#5186 Akt (pan) (C67E7) Rabbit mAb (Alexa Fluor® 647 Conjugate)	IF-IC, F	H, M, R, Mk, Dm
	#4343 Akt (pan) (C67E7) Rabbit mAb (Sepharose Bead Conjugate)	IP	H, M, R, Mk, Dm
	#9272 Akt Antibody	W, IP, IF-IC, F	H, M, R, Hm, Mk, C, Dm, B, Pg, (Dg)
	#2920 Akt (pan) (40D4) Mouse mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
	#4821 Akt (pan) (40D4) Mouse mAb (Biotinylated)	W, IP, F	H, M, R, Mk
	#4298 Akt (pan) (40D4) Mouse mAb (HRP Conjugate)	W	H, M, R, Mk



Akt (pan) (C67E7) Rabbit mAb #4691: Confocal IF analysis of rat retina **(A)**, cerebellum **(B)**, and spinal cord **(C)** using #4691 (red) and S6 Ribosomal Protein (54D2) Mouse mAb #2317. Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

Unparalleled Product Quality, Validation, and Technical Support



Phospho-Akt (Ser473) (D9E) XP® Rabbit mAb #4060: Confocal IF analysis of coronal rat brain sections, treated as indicated, using #4060 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

APPLICATIONS KEY:
W Western / **IP** Immunoprecipitation / **IHC** Immunohistochemistry / **IF** Immunofluorescence / **F** Flow Cytometry / **ChIP** Chromatin Immunoprecipitation / (**-IC** Immunocytochemistry, **-P** Paraffin, **-F** Frozen) / **E-P** Peptide ELISA

Akt

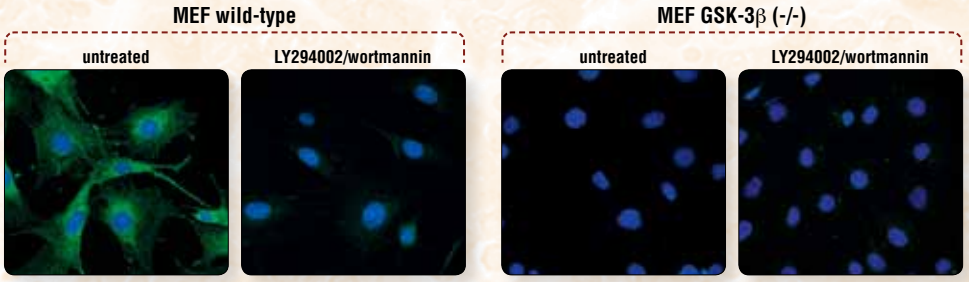
		Applications	Reactivity
	#5697 Akt (pan) (40D4) Mouse mAb (Magnetic Bead Conjugate)	IP	H, M, R, Mk
	#3653 Akt (pan) (40D4) Mouse mAb (Sepharose Bead Conjugate)	IP	H, M, R, Mk
	#2966 Akt (5G3) Mouse mAb	IP, IF-IC, F	H, M, R, Hm
	#2917 Akt (5G3) Mouse mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R, Hm
	#2944 Akt (5G3) Mouse mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R, Hm
	#2938 Akt1 (C73H10) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
	#2967 Akt1 (2H10) Mouse mAb	W, IP	H, M, R
	#2964 Akt2 (5B5) Rabbit mAb	W, IP	H, M, R, Mk
	#3063 Akt2 (D6G4) Rabbit mAb	W, IP	H, M, R, Mk
	#4090 Akt2 (D6G4) Rabbit mAb (Sepharose Bead Conjugated)	IP	H, M, R, Mk
	#5239 Akt2 (L79B2) Mouse mAb	W, IP	H, M, R, Mk
	#3788 Akt3 (62A8) Rabbit mAb	W, IP	H, M, R
	#4059 Akt3 Antibody	W, IP	H, M, R
	#8018 Akt3 (L47B1) Mouse mAb	W	H, M, R, Hm

GSK-3

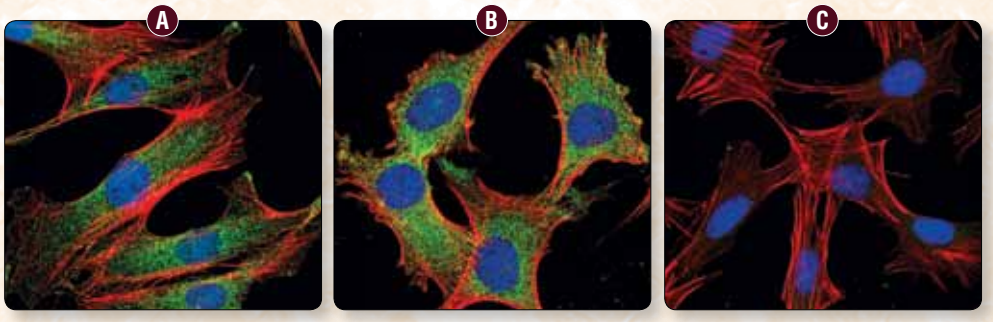
		Applications	Reactivity
NEW	#8452 Phospho-GSK-3α (Ser21) (D1G2) Rabbit mAb	W, IP	H, M, R, Mk
	#9316 Phospho-GSK-3α (Ser21) (36E9) Rabbit mAb	W, IHC-P	H, M, R, Mk
	#5090 Phospho-GSK-3α (Ser21) (27E5) Mouse mAb	E-P	H
	#9337 Phospho-GSK-3α (Ser21) (46H12) Mouse mAb	W	H, M, R, Mk, Z
	#9327 Phospho-GSK-3α/β (Ser21/9) (37F11) Rabbit mAb (GSK-3α Preferred)	W, IP	H, M, R, Mk
	#9331 Phospho-GSK-3α/β (Ser21/9) Antibody	W, IHC-P	H, M, R, Mk, Z
	#5676 GSK-3α/β (D75D3) XP® Rabbit mAb	W, IP, IF-IC	H, M, R, Hm, Mk
	#4818 GSK-3α (D80D1) XP® Rabbit mAb	IF-IC, F	H, M, (R)
	#4337 GSK-3α (D80E6) Rabbit mAb	W, IP	H, M, R, Hm, Mk
	#9338 GSK-3α Antibody	W	H, M, R, Mk
NEW	#5558 Phospho-GSK-3β (Ser9) (D85E12) XP® Rabbit mAb	W, IP, IF-IC, F	H, M, R, Hm
	#9322 Phospho-GSK-3β (Ser9) (D3A4) Rabbit mAb	W, IP	H, M, R
	#9323 Phospho-GSK-3β (Ser9) (5B3) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
	#9336 Phospho-GSK-3β (Ser9) Antibody	W	H, M, R, Mk, (Z, B)
	#3548 Phospho-GSK-3β (Thr390) Antibody	W	H
	#9315 GSK-3β (27C10) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
NEW	#9832 GSK-3β (3D10) Mouse mAb	W, IP, IF-IC, F	H, M, R, Hm, Mk

GSK-3

Glycogen synthase kinase-3 (GSK-3) is a Ser/Thr kinase that was initially identified as an enzyme that regulates glycogen synthesis in response to insulin. GSK-3 is a critical downstream element of the PI3 kinase/Akt cell survival pathway whose activity can be inhibited by Akt-mediated phosphorylation at Ser21 of GSK-3α and Ser9 of GSK-3β. When active, GSK-3 phosphorylates Tau under both normal and Alzheimer disease pathological conditions. The hyperphosphorylation of Tau results in the dissociation of Tau from the microtubule, ultimately leading to neurofibrillary tangle formation and apoptosis of the neuron. Administration of lithium and other GSK-3 inhibitors results in reduced phosphorylation of Tau and offer a promising therapeutic for Alzheimer disease treatment.

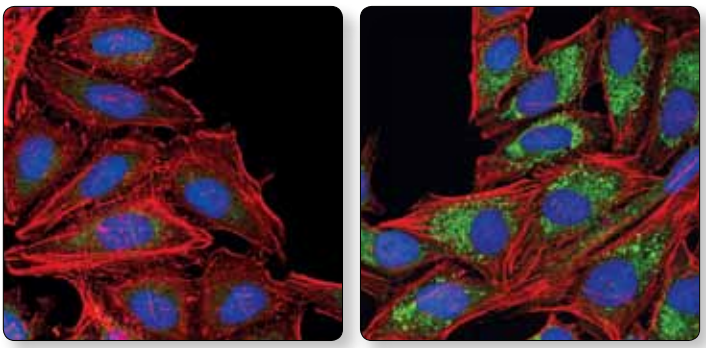


Phospho-GSK-3β (Ser9) (D85E12) XP® Rabbit mAb #5558: Confocal IF analysis of wild type mouse embryonic fibroblasts (MEFs) (left) and GSK-3β (-/-) MEFs (right), treated as indicated, using #5558 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye). (MEF wild type and GSK-3β (-/-) cells were kindly provided by Dr. Jim Woodgett, University of Toronto, Canada).

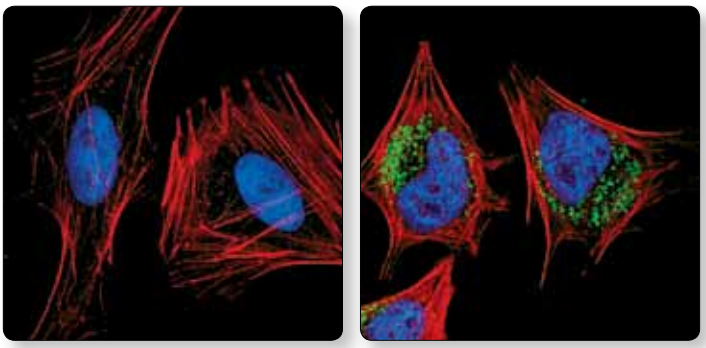


GSK-3α (D80D1) XP® Rabbit mAb #4818: Confocal IF analysis of MEF wild type cells **(A)**, MEF/GSK-3β (-/-) cells **(B)**, and MEF/GSK-3α (-/-) cells **(C)** using #4818 (green). Actin filaments were labeled with DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye). (MEF/wild type, GSK-3α (-/-) and GSK-3β (-/-) cells were kindly provided by Dr. Jim Woodgett, University of Toronto, Canada).

Autophagy



LC3A (D50G8) XP® Rabbit mAb #4599: Confocal IF analysis of HeLa cells, untreated (left) or chloroquine-treated (right), using #4599 (green). Actin filaments were labeled using DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

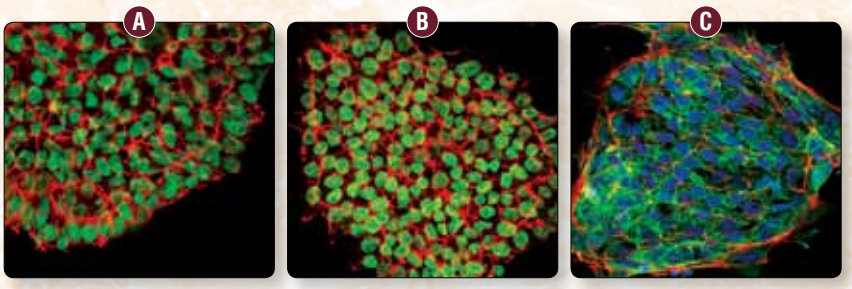


LC3B (D11) XP® Rabbit mAb #3868: Confocal IF analysis of HeLa cells, untreated (left) or chloroquine-treated (right), using #3868 (green). Actin filaments were labeled using DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

		Applications	Reactivity
	#3415 Atg3 Antibody	W	H, M, R, Mk, (C, X, B, Dg)
NEW	**#7613 Atg4A (D62C10) Rabbit mAb**	W, IP	H
	#5299 Atg4B Antibody	W	H, M, R
	#5262 Atg4C Antibody	W, IP	H, M, Mk
NEW	**#8540 Atg5 (D1G9) Rabbit mAb**	W, IP	W, M, R, Mk, (B, Dg, Pg)
NEW	**#9980 Atg5 (D5G3) Rabbit mAb**	W, IP	H, Mk
	#2630 Atg5 Antibody	W, IP	H, Mk
NEW	**#8558 Atg7 (D12B11) Rabbit mAb**	W, IP	H, M, R, (Mk, B)
	#2631 Atg7 Antibody	W	H, M, R, (Mk)
	#2010 Atg12 Antibody (Human Specific)	W, IP, IF-IC	H
	#2011 Atg12 Antibody (Mouse Specific)	W, IP, IF-IC	M
	#3495 Beclin-1 (D40C5) Rabbit mAb	W, IP	H, M, R, Mk
	#3738 Beclin-1 Antibody	W, IP	H, M, R
	#4599 LC3A (D50G8) XP® Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, (Mk, Dg)
	#4108 LC3A/B Antibody	W, IF-IC, F	H, M, R, (Mk, C, Dg, Z, X)
	#3868 LC3B (D11) XP® Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, (Mk, B, Pg)
	#2775 LC3B Antibody	W, IF-IC, F	H, M, R, (Mk, B, Pg)
	#3358 PI3 Kinase Class III (D4E2) Rabbit mAb	W	H, M, R, Mk
	#4263 PI3 Kinase Class III (D9A5) Rabbit mAb	W, IP	H, M, R, Mk
	#3811 PI3 Kinase Class III Antibody	W, IP	H, M, R
NEW	**#7151 Rubicon (D8B2) Rabbit mAb**	W	H
NEW	**#8465 Rubicon (D9F7) Rabbit mAb**	W	H, M
NEW	**#6887 Phospho-ULK1 (Ser317) Antibody**	W	H, M, (R, Mk, B)
	#4634 Phospho-ULK1 (Ser467) Antibody	W	M, (H, R, Mk)
NEW	**#5869 Phospho-ULK1 (Ser555) (D1H4) Rabbit mAb**	W, IP	H, M, (R)
NEW	**#6888 Phospho-ULK1 (Ser757) Antibody**	W, IP	H, M, Mk
	#4776 ULK1 (A705) Antibody	W	H
	#4773 ULK1 (R600) Antibody	W	H, Mk
	#5320 UVRAG Antibody	W, IP	H, M

StemLight™ Pluripotency Antibody Kits

The StemLight™ Pluripotency Antibody Kit #9656 contains antibodies against a selection of stem cell markers. The kit can be used to analyze the pluripotent or undifferentiated status of human embryonic stem cells or induced pluripotent stem (iPS) cells. Loss of marker expression indicates loss of pluripotency or differentiation of the culture. CST also offers a number of other StemLight™ Kits to specifically measure expression of transcription factors, surface markers, or iPS reprogramming factors. All kit components are pre-optimized for parallel use in immunofluorescence.



StemLight™ iPS Cell Reprogramming Antibody Kit #9092: Confocal IF analysis analysis of iPS cells using Sox2 (D6D9) XP® Rabbit mAb #3579 **(A)**, Nanog (D73G4) XP® Rabbit mAb #4903 **(B)**, and LIN28A (D84C11) XP® Rabbit mAb #3695 **(C)** (green). Actin filaments have been labeled with DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

NEW **#9092 StemLight™ iPS Cell Reprogramming Antibody Kit**
Oct-4A (C30A3) Rabbit mAb, Sox2 (D6D9) XP® Rabbit mAb, Nanog (D73G4) XP® Rabbit mAb, LIN28A (D84C11) XP® Rabbit mAb, KLF4 Ab, c-Myc (D84C12) XP® Rabbit mAb

#9656 StemLight™ Pluripotency Antibody Kit
Oct-4A (C30A3) Rabbit mAb, Sox2 (D6D9) XP® Rabbit mAb, Nanog Ab, SSEA4 (MC813) Mouse mAb, TRA-1-60(S) (TRA-1-60(S)) Mouse mAb, TRA-1-81 (TRA-1-81) Mouse mAb

#9093 StemLight™ Pluripotency Transcription Factor Antibody Kit
Nanog (D73G4) XP® Rabbit mAb #4903, Oct-4A (C30A3) Rabbit mAb #2840, Sox2 (D6D9) XP® Rabbit mAb #3579

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Tentative Stimulatory Modification
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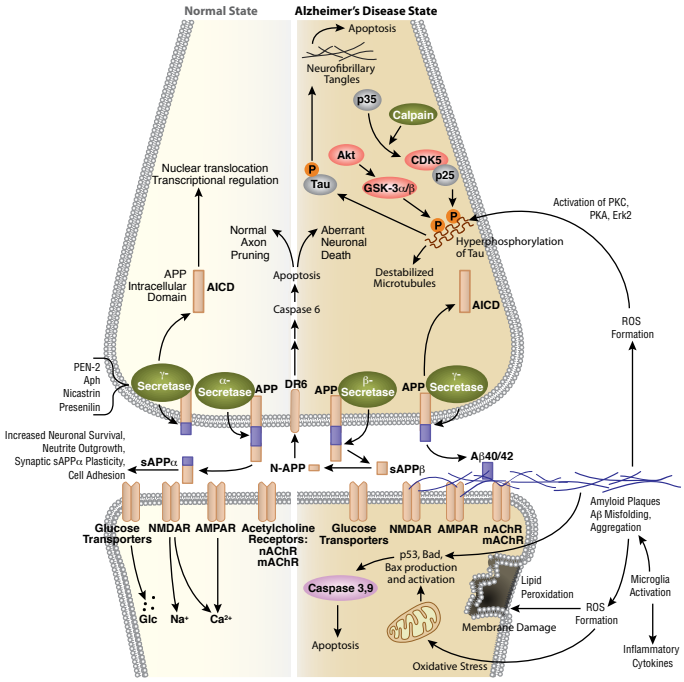
Transcriptional Stimulatory Modification
Transcriptional Inhibitory Modification

Signaling Pathways

Amyloid Plaque and Neurofibrillary Tangle Formation in Alzheimer's Disease



Pathway Description: Alzheimer's Disease is one of the most common neurodegenerative diseases worldwide. Clinically, it is characterized by the presence of extracellular amyloid plaques and intracellular neurofibrillary tangles, resulting in neuronal dysfunction and cell death. Central to this disease is the differential processing of the integral membrane protein APP (Amyloid Precursor Protein) in the normal versus disease state. In the normal state, APP is initially cleaved by α-secretase to generate sAPPα and a C83 carboxy-terminal fragment. The presence of sAPPα is associated with normal synaptic signaling and results in synaptic plasticity, learning and memory, emotional behaviors, and neuronal survival. In the disease state, APP is cleaved sequentially by β-secretase and γ-secretase to release an extracellular fragment called Aβ40/42. This neurotoxic fragment frequently aggregates and results in Aβ40/42 oligomerization and plaque formation. Aβ40/42 aggregation results in blocked ion channels, disruption of calcium homeostasis, mitochondrial oxidative stress, impaired energy metabolism and abnormal glucose regulation, and ultimately neuronal cell death. Alzheimer's Disease is also characterized by the presence of neurofibrillary tangles. These tangles are the result of hyperphosphorylation of the microtubule associated protein Tau. GSK-3β and CDK5 are the kinases primarily responsible for phosphorylation of Tau, although other kinases such as PKC, PKA, and ERK2 are also involved. Hyperphosphorylation of Tau results in the dissociation of Tau from the microtubule, leading to microtubule destabilization and oligomerization of the Tau protein within the cell. Neurofibrillary tangles form as a result of Tau oligomerization and lead to apoptosis of the neuron.

Selected Reviews:

Bossy-Wetzel, E. et al. (2004) Molecular pathways to neurodegeneration. *Nat. Med.* 10 Suppl, S2–9.
Chen, J.X. and Yan, S.S. (2010) Role of Mitochondrial Amyloid-beta in Alzheimer's Disease. *J. Alzheimers Dis.* 20 Suppl. 2, S569–578.
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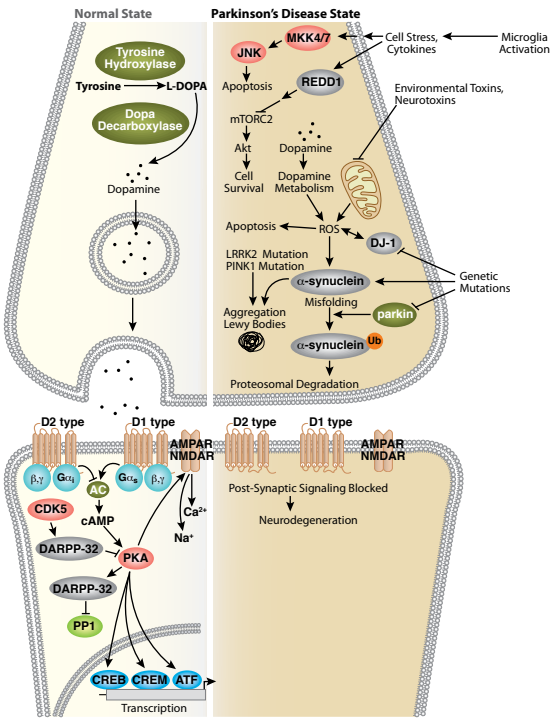
Thinakaran, G. and Koo, E.H. (2008) Amyloid precursor protein trafficking, processing, and function. *J. Biol. Chem.* 283, 29615–29619.

Dopamine Signaling in Parkinson's Disease



Pathway Description: Parkinson's Disease is the most prevalent neurodegenerative movement disorder among people over age 65. Clinically, this disease is characterized by bradykinesia, resting tremors, and rigidity due to loss of dopaminergic neurons within the substania nigra section of the ventral midbrain. In the normal state, release of the neurotransmitter dopamine in the presynaptic neuron results in signaling in the postsynaptic neuron through D1 and D2 type dopamine receptors. D1 receptors signal through G proteins to activate adenylate cyclase, causing cAMP formation and activation of PKA. D2 type receptors block this signaling by inhibiting adenylate cyclase. Parkinson's Disease can occur through both genetic mutation (familial) and exposure to environmental and neurotoxins (sporadic). Exposure to environmental and neurotoxins can cause mitochondrial oxidative stress and release of reactive oxygen species (ROS), leading to a number of cellular responses including apoptosis and the misfolding of α-synuclein, which can aggregate with itself and other proteins to form cytotoxic Lewy Bodies. Misfolded α-synuclein is normally ubiquitinated by parkin resulting in proteosomal degradation. However, genetic mutations to both α-synuclein and parkin disrupt this pathway and lead to further accumulation into Lewy Bodies. There is also an inflammatory component to this disease, resulting from activation of microglia that cause the release of inflammatory cytokines and cell stress. This microglia activation causes apoptosis via the JNK pathway and by blocking the Akt signaling pathway via REDD1.

Selected Reviews:

Bossy-Wetzel, E. et al. (2004) Molecular pathways to neurodegeneration. *Nat. Med.* 10 Suppl, S2–9.
Dauer, W. and Przedborski, S. (2003) Parkinson's disease: mechanisms and models. *Neuron* 39, 889–909.
Girault, J.A. and Greengard, P. (2004) The neurobiology of dopamine signaling. *Arch. Neurol.* 61, 641–644.
Patten, D.A. et al. (2010) Reactive Oxygen Species: Stuck in the Middle of Neurodegeneration. *J. Alzheimers Dis.* 20 Suppl. 2, 357–367.
Wood-Kaczmar, A. et al. (2006) Understanding the molecular causes of Parkinson's disease. *Trends Mol Med* 12, 521–528.
Yasuda, T. and Mochizuki, H. (2010) The regulatory role of alpha-synuclein and parkin in neuronal cell apoptosis; possible implications for the pathogenesis of Parkinson's disease. *Apoptosis* 15, 1312–1321.

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