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Key: H Human  M Mouse  R Rat  B Bosine  C Canine  Ch Chicken  CR Cotton Rat  D Drosophila  E Equine  F Feline  Ms Multi Species  P Porcine  Pr Primate  Rb Rabbit  Tg. pondi  V Viral  X Xenopus  Z Zebrafish


Activin RIIB

**Application:** Bioassay - blocking TGF-β signaling effects

**Product:** Recombinant Mouse Activin RIIB/Fc Chimeric Protein

**Catalog #:** 3725-RB

**Reference(s):**


Sample Type: rat retinal cells

Amphiregulin

**Application:** Bioassay - axon outgrowth and cell migration

**Product:** Recombinant Mouse Amphiregulin Protein

**Catalog #:** 989-AR

**Reference(s):**


Sample Type: mouse dorsal root ganglia

BDNF

**Application:** Bioassay - cell survival

**Product:** Recombinant Human BDNF Protein

**Catalog #:** 248-BD

**Reference(s):**


Sample Type: mouse motor neurons

**Application:** ELISA Kit

**Product:** Human BDNF Quantikine ELISA Kit

**Catalog #:** DBD00

**Reference(s):**


Sample Type: rat brain homogenate
**BDNF, continued**

**Application:** Immunohistochemistry  
**Product:** Human BDNF Polyclonal Antibody  
Catalog # AF248  
**Reference(s):**  
Sample Type: rat trigeminal ganglia

**BDNF Expression in Rat Spinal Cord.** BDNF was detected in cryostat sections of rat spinal cord tissue sections using anti-human BDNF polyclonal antibody (Catalog # AF248). Tissue was stained using Rhodamine Red™ X-conjugated goat anti-chicken secondary antibody and counterstained with FluoroNissl™ Green.

**APPLICATION:** Western Blot  
**Product:** Human BDNF Monoclonal Antibody  
Catalog # MAB248  
**Reference(s):**  
Sample Type: porcine cortex, hippocampus, and brain stem homogenates

**BMP-2**  
**Application:** Bioassay - Differentiation  
**Product:** Recombinant Human BMP-2 Protein  
Catalog # 355-BM  
**Reference(s):**  
Sample Type: rat neural progenitor cells

**Application:** Bioassay - SMAD Phosphorylation  
**Product:** Recombinant Human BMP-2 Protein  
Catalog # 355-BM  
**Reference(s):**  
Sample Type: mouse cortical cells

**E-Cadherin**  
**Application:** Bioassay - Neurite Outgrowth  
**Product:** Recombinant Human E-Cadherin/Fc Chimeric Protein  
Catalog # 648-EC  
**Reference(s):**  
Sample Type: chicken retinal explant

**Chordin**  
**Application:** Bioassay - Blocking BMP Signaling Effects  
**Product:** Recombinant Mouse Chordin Protein  
Catalog # 758-CN  
**Reference(s):**  
Sample Type: mouse spinal cord and hindbrain explants

**Rhodamine Red and FluoroNissl are trademarks of Molecular Probes, Inc.**
### NEURAL DEVELOPMENT

#### EGF Family

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#### Ephs/Ephrins

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| EphA2                     | H M H M H M H M       |                       |                       |                               |              |
| EphA3                     | M M M M M M M M       |                       |                       |                               |              |
| EphA4                     | M M M M M M M M       |                       |                       |                               |              |
| EphA5                     | R R R R R H M R       |                       |                       |                               |              |
| EphA6                     | M M M M M M M M       |                       |                       |                               |              |
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| EphA8                     | M M M M M M M M       |                       |                       |                               |              |
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| Ephrin-A3                 | H H H H H H H H       |                       |                       |                               |              |
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| Ephrin-B2                 | M Z M Z M Z M Z       |                       |                       |                               |              |
| Ephrin-B3                 | H H H H H H H H       |                       |                       |                               |              |

### DCC

**Application:** Immunohistochemistry  
**Product:** Mouse DCC Polyclonal Antibody  
**Catalog #** AF844  
**Reference(s):**  
Sample Type: rat and chicken oligodendrocyte precursors

**Application:** Neutralization  
**Product:** Mouse DCC Polyclonal Antibody  
**Catalog #** AF844  
**Reference(s):**  
Sample Type: chicken spinal cord explant

### DLL4

**Application:** In Vivo & Bioassay - differentiation  
**Product:** Recombinant Human DLL4 Protein  
**Catalog #** 1506-D4  
**Reference(s):**  
Sample Type: mouse & mouse multipotent adult progenitor cells

### EGF

**Application:** Bioassay - neurosphere assay  
**Product:** Recombinant Human EGF Protein  
**Catalog #** 236-EG  
**Reference(s):**  
Sample Type: rat neural progenitor cells

### EphA3

**Application:** Western Blot  
**Product:** Mouse EphA3 Polyclonal Antibody  
**Catalog #** AF640  
**Reference(s):**  
Sample Type: mouse spinal cord homogenate
EphA4

Application: Immunohistochemistry
Product: Mouse EphA4 Polyclonal Antibody
Catalog # AF641

Reference(s):
Sample Type: mouse brain and spinal cord

EphA7

Application: Immunohistochemistry & Bioassay - retinal stripe assay
Product: Recombinant Mouse EphA7/Fc Chimeric Protein
Catalog # 608-A7

Reference(s):
Sample Type: mouse retinal explant & chicken retinal axons

EphB2

Application: Immunohistochemistry
Product: Mouse EphB2 Polyclonal Antibody
Catalog # AF467

Reference(s):
Sample Type: rat spinal cord

Application: Immunoprecipitation
Product: Mouse EphB2 Polyclonal Antibody
Catalog # AF467

Reference(s):
Sample Type: human glioma U87, U251, and T98G glioma cell line lysates

Application: Western Blot
Product: Mouse EphB2 Polyclonal Antibody
Catalog # AF467

Reference(s):
Sample Type: rat spinal cord homogenate

EphB3

Application: Western Blot
Product: Mouse EphB3 Polyclonal Antibody
Catalog # AF432

Reference(s):
Sample Type: mouse optic nerve and retina homogenate

Ephrin-A1

Application: Bioassay - growth cone collapse
Product: Recombinant Mouse Ephrin-A1/Fc Chimeric Protein
Catalog # 602-A1

Reference(s):
Sample Type: mouse neurons

Application: Bioassay - dendritic spine retraction
Product: Recombinant Mouse Ephrin-A1/Fc Chimeric Protein
Catalog # 602-A1

Reference(s):
Sample Type: mouse hippocampal slice

Ephrin-A2

Application: Immunohistochemistry

Ephrin-A2 Expression in Rat Embryonic Neurons. Ephrin-A2 was detected in rat embryonic hippocampal neurons using goat anti-mouse Ephrin-A2 polyclonal antibody (Catalog # AF603; green). Astrocytes were stained using an anti-GFAP antibody (red).

Application: Western Blot
Product: Mouse EphB2 Polyclonal Antibody
Catalog # AF467

Reference(s):
Sample Type: rat spinal cord homogenate

Ephrin-A3

Application: Bioassay - dendritic spine outgrowth
Product: Recombinant Human Ephrin-A3/Fc Chimeric Protein
Catalog # 359-EA

Reference(s):
Sample Type: mouse hippocampal slice

Ephrin-A5

Application: Bioassay - inhibition of transsynaptic interactions
Product: Recombinant Human Ephrin-A5/Fc Chimeric Protein
Catalog # 374-EA

Reference(s):
Sample Type: rat hippocampal neurons
## NEURAL DEVELOPMENT

### Ephrin-B1

**Application:** Bioassay - decreased cell growth  
**Product:** Recombinant Mouse Ephrin-B1/Fc Chimeric Protein  
Catalog # 473-EB  
Sample Type: human U87, U251, and T98G glioma cell lines

### Ephrin-B2

**Application:** Bioassay - neurite outgrowth  
**Product:** Recombinant Mouse Ephrin-B2/Fc Chimeric Protein  
Catalog # 496-EB  
Sample Type: mouse midbrain/hindbrain boundary explants

### Ephrin-B3

**Application:** Bioassay - growth cone collapse  
**Product:** Recombinant Human Ephrin-B3/Fc Chimeric Protein  
Catalog # 395-EB  
Sample Type: mouse neurons

### Growth/Differentiation Factor Family

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#### Hedgehog Family

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#### IGF Family

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Key:  
- H: Human  
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- Ca: Canine  
- Ch: Chicken  
- Cr: Cotton Rat  
- Dr: Drosophila  
- Eq: Equine  
- F: Feline  
- Ms: Multi Species  
- P: Porcine  
- Pr: Primate  
- Rp: Rabbit  
- Tg: T. gondii  
- V: Viral  
- X: Xenopus  
- Z: Zebrafish

**ErbB4**

**Application:** Bioassay - blocking NRG1 signaling  
**Product:** Recombinant Human ErbB4/Fc Chimeric Protein  
Catalog # 1131-ER  
**Reference(s):**  
Sample Type: rat dorsal root ganglia and oligodendrocyte precursor cell co-culture

---

**FGF basic**

**Application:** Bioassay - differentiation  
**Product:** Recombinant Human FGF basic Protein  
Catalog # 233-F8  
**Reference(s):**  
Sample Type: mouse embryonic stem cells  

Sample Type: mouse Nurr-1 embryonic stem cells

---

**FGF-4**

**Application:** Bioassay - differentiation  
**Product:** Recombinant Human FGF-4 Protein  
Catalog # 235-F4  
**Reference(s):**  
Sample Type: mouse embryonic stem cells

---

**FGF-8**

**Application:** Bioassay - neurite extension and directional outgrowth  
**Product:** Recombinant Mouse FGF-8b Protein  
Catalog # 423-F8  
**Reference(s):**  
Sample Type: mouse neurons  

Sample Type: mouse transgenic Nurr-1 embryonic stem cells

---

**GDF-7**

**Application:** Bioassay - differentiation  
**Product:** Recombinant Mouse GDF-7 Protein  
Catalog # 779-G7  
**Reference(s):**  
Sample Type: mouse embryonic stem cells

---

**GDNF**

**Application:** Bioassay – neuronal survival and antibody blockade  
**Product:** Recombinant Mouse GDNF Protein  
Catalog # 212-GD  
**Reference(s):**  
Sample Type: mouse neurons  

Sample Type: mouse transgenic Nurr-1 embryonic stem cells  

---

**GDNF-induced Neuronal Survival.** Recombinant human GDNF protein (Catalog # 212-GD) increases chick embryonic (E15) dorsal root ganglion neuronal survival in a dose-dependent manner (blue) as measured by the MTT Viability Assay (Catalog # TA5355). The neuronal survival effect elicited by GDNF is neutralized (maroon) by increasing concentrations of goat anti-human GDNF polyclonal antibody (Catalog # AF-212-NA).
## GDNF, continued

**Application:** Immunohistochemistry  
**Product:** Human GDNF Polyclonal Antibody  
Catalog # AF-212-NA  
**Reference(s):**  
Winkler, C. et al. (2006) Continuous exposure to glial cell line-derived neurotrophic factor to mature dopaminergic transplants impairs the graft's ability to improve spontaneous motor behavior in Parkinsonian rats. Neuroscience **141**:521.  
Sample Type: rat brain  
Sample Type: mouse brain  
Oo, T.F. et al. (2005) Anatomical basis of glial cell line-derived neurotrophic factor expression in the striatum and related basal ganglia during postnatal development of the rat. J. Comp. Neurol. **484**:57.  
Sample Type: rat substantia nigra and striatal tissue

**Application:** Western Blot  
**Product:** Human GDNF Polyclonal Antibody  
Catalog # AF-212-NA  
**Reference(s):**  
Sample Type: rat and human hippocampal homogenates

### GFRα-1/GDNF Rα-1

**Application:** Bioassay - NCAM-mediated cell adhesion  
**Product:** Recombinant Rat GFRα-1/Fc Chimeric Protein  
Catalog # 560-GR  
**Reference(s):**  
Sample Type: African green monkey COS-7 kidney fibroblast cells transfected with rat p140NCAM

**Application:** Immunohistochemistry  
**Product:** Rat GFRα-1 Polyclonal Antibody  
Catalog # AF560  
**Reference(s):**  
Sample Type: rat neospheres  
Sample Type: rat brain

**Application:** Neutralization  
**Product:** Rat GFRα-1 Polyclonal Antibody  
Catalog # AF560  
**Reference(s):**  
Sample Type: chicken motor neurons

### Neurotrophic Factors, Receptors, & Related Molecules

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<th>LINGO-1</th>
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<th>MAG/Siglec-4a</th>
<th>Meteorin</th>
<th>Midkine</th>
<th>Neurtin</th>
<th>Neuropoietin</th>
<th>β-NGF</th>
<th>NGF R/p75</th>
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<th>Nogo Receptor</th>
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Continued on page 10
**GFRα-1/GDNF Rα-1**, continued

*Application: Western Blot*

*Product:* Rat GFRα-1 Polyclonal Antibody  
Catalog # AF560

*Reference(s):*

Sample Type: rat sympathetic neuron lysate

---

**HB-EGF**

*Application: Western Blot*

*Product:* Human HB-EGF Polyclonal Antibody  
Catalog # AF-259-NA

*Reference(s):*

Sample Type: human glioblastoma homogenate

---

**HGF**

*Application: Immunohistochemistry & Western Blot*

*Product:* Human HGF Polyclonal Antibody  
Catalog # AF-294-NA

*Reference(s):*

Sample Type: mouse brain and mouse brain homogenate

---

**IGFBP-4**

*Application: ELISA Kit*

*Product:* Human IGFBP-4 DuoSet  
Catalog # DY804

*Reference(s):*

Sample Type: human U87MG glioma cell line supernatant

---

**IGF-I**

*Application: Immunohistochemistry*

*Product:* Mouse IGF-I Polyclonal Antibody  
Catalog # AF791

*Reference(s):*

Sample Type: mouse spinal cord

---

**Jagged 1**

*Application: Bioassay - differentiation*

*Product:* Recombinant Rat Jagged 1/Fc Chimeric Protein  
Catalog # 599-JG

*Reference(s):*

Sample Type: human multipotent adult progenitor cells

---

**NCAM-L1**

*Application: Bioassay - neural crest migration*

*Product:* Recombinant Human NCAM-L1/Fc Chimeric Protein  
Catalog # 777-NC

*Reference(s):*

Sample Type: mouse embryonic gut explant

---

**Netrin-1**

*Application: Bioassay - effect on axonal growth*

*Product:* Recombinant mouse Netrin-1 Protein  
Catalog # 1109-N1

*Reference(s):*

Sample Type: mouse embryonic stem cell-derived dopaminergic neurons

---

**IGF-I**

*Application: ELISA Kit*

*Product:* Mouse IGF-I Quantikine ELISA Kit  
Catalog # MG100

*Reference(s):*

Sample Type: mouse hippocampal and spinal cord homogenates and serum
**NEURAL DEVELOPMENT**

### Neurofascin

**Application:** Bioassay – neurite outgrowth

**A:** Recombinant rat Neurofascin (Catalog # 3235-NF) immobilized on a microplate promotes neurite outgrowth in rat cortical neurons. **B:** Cortical neurons cultured under the same conditions in the absence of neurofascin exhibit little outgrowth.

### Neuropilin-1

**Application:** Immunohistochemistry

**Product:** Rat Neuropilin-1 Polyclonal Antibody
Catalog # AF566

**Reference(s):**

**Sample Type:** rat cervical spinal cord

**Neuropilin-1 Expression in Mouse Embryonic Spinal Cord.** Neuropilin-1 was detected in a cryostat section of mouse embryonic spinal cord (E15) using anti-rat Neuropilin-1 polyclonal antibody (Catalog # AF566). Tissue was stained using the anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CT500B; brown) and counterstained with hematoxylin (blue).
**β-NGF**

**Application:** Bioassay - axonal elongation  
**Product:** Recombinant Human β-NGF Protein  
Catalog # 256-GF  

**Reference(s):**  

**Sample Type:** chicken dorsal root ganglia

**Application:** Bioassay - effect on doublecortin expression  
**Product:** Recombinant Mouse β-NGF Protein  
Catalog # 1156-NG  

**Reference(s):**  

**Sample Type:** mouse dorsal root ganglia

**Application:** Bioassay - ERK1/2 signaling activation  
**Product:** Recombinant Rat β-NGF Protein  
Catalog # 556-NG  

**Reference(s):**  

**Sample Type:** rat L4/5 nerve roots and dorsal root ganglia

**NGF R/p75NTR**

**Application:** Bioassay - neurite outgrowth  
**Product:** Recombinant Mouse NGF R/p75NTR/Fc Chimeric Protein  
Catalog # 1157-NR  

**Reference(s):**  

**Sample Type:** mouse neurons

**NgR2/NgRH1**

**Application:** Flow Cytometry  
**Product:** Human NgR2/NgRH1 Polyclonal Antibody  
Catalog # AF2776  

**Reference(s):**  

**Sample Type:** rat sciatic nerve cells

**Noggin**

**Application:** Bioassay - blocking BMP signaling effects  
**Product:** Recombinant Mouse Noggin/Fc Chimeric Protein  
Catalog # 719-NG  

**Reference(s):**  

**Sample Type:** rat neural progenitor cells


**Sample Type:** mouse spinal cord and hindbrain explants

**Nogo-A**

**Application:** Bioassay - neurite outgrowth  
**Product:** Recombinant Rat Nogo-A/Fc Chimeric Protein  
Catalog # 2445-NG  

**Reference(s):**  

**Sample Type:** chicken dorsal root ganglia

**Application:** Flow Cytometry  
**Product:** Human Nogo Receptor Polyclonal Antibody  
Catalog # AF1208  

**Reference(s):**  

**Sample Type:** Human SH-SY5Y neuroblastoma cell line lysate

**Notch-2**

**Application:** Immunohistochemistry  

**Nogo-A Inhibition of Neurite Outgrowth.** A: Embryonic chick dorsal root ganglion (DRG) cells exhibit neurite outgrowth when cultured on nitrocellulose-coated plates treated with laminin. B: Pre-coating similar plates with recombinant rat Nogo-A (Catalog # 2445-NG) completely inhibits neurite outgrowth.

**Nogo Receptor**

**Application:** Western Blot  
**Product:** Human Nogo Receptor Polyclonal Antibody  
Catalog # AF1208  

**Reference(s):**  

**Sample Type:** Human SH-SY5Y neuroblastoma cell line lysate

**Notch-2 Expression in Rat Brain.** Notch-2 was detected in cryostat sections of rat brain (through choroid plexus) using anti-rat Notch-2 polyclonal antibody (Catalog # AF1190). Tissue was stained using the anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).
### NT-3

**Application:** Bioassay - differentiation  
**Product:** Recombinant Human NT-3 Protein  
Catalog #: 267-N3

**Reference(s):**  
Sample Type: mouse embryonic stem cells

**Application:** ELISA Kit  
**Product:** Human NT-3 DuoSet  
Catalog #: DY267

**Reference(s):**  
Sample Type: recombinant human NT-3 protein

### PIGF

**Application:** ELISA Kit  
**Product:** Human PIGF Quantikine ELISA Kit  
Catalog #: DPG00

**Reference(s):**  
Sample Type: human brain tumor homogenate

### Pleiotrophin

**Application:** Immunohistochemistry  
**Product:** Human Pleiotrophin Polyclonal Antibody  
Catalog #: AF-252-PB

**Reference(s):**  
Sample Type: mouse brain and neurospheres

### Plexin A3

**Application:** Immunohistochemistry

#### Plexin A3 Expression in Embryonic Spinal Cord

Plexin A3 was detected in mouse embryonic (E13.5) spinal cord using anti-mouse Plexin A3 polyclonal antibody (Catalog # AF4075). Cells were stained using a NorthernLights-557 fluorochrome-labeled donkey anti-goat IgG secondary antibody (Catalog # NL001; red) and counterstained with DAPI (blue).
Ret

Application: Immunohistochemistry

Product: Mouse Ret Polyclonal Antibody
Catalog # AF482

Reference(s):
Tamura, S. et al. (2005) TRPV2, a capsaicin receptor homologue, is expressed predominantly in the neurotrophin-3-dependent subpopulation of primary sensory neurons. Neuroscience 130:223.
Sample Type: mouse dorsal root ganglia

Application: Western Blot

Product: Mouse Ret Monoclonal Antibody
Catalog # MAB482

Reference(s):
Sample Type: rat PC12 pheochromocytoma cell (transfected with human RET-C634Y) lysate

RGM-B

Application: Immunohistochemistry

RGM-B Expression in Mouse Brain. RGM-B was detected in cryostat sections of mouse brain (trigeminal ganglia) using sheep anti-mouse RGM-B polyclonal antibody (Catalog # AF3597). Tissue was stained using HRP-DAB detection reagents and counterstained with hematoxylin (blue).

ROBO4

Application: Flow Cytometry

Detection of ROBO4 by Flow Cytometry. ROBO4 expression was confirmed in transfectants using phycoerythrin(PE)-conjugated mouse anti-human ROBO4 monoclonal antibody (Catalog # FAB2454P; filled histogram). Staining with a PE-conjugated isotype control (Catalog # IC003P; open histogram) highlights the specificity of the ROBO4 antibody.

Semaphorin 3A

Application: Bioassay - growth cone collapse

Product: Recombinant Human Semaphorin 3A/Fc Chimeric Protein
Catalog # 1250-S3

Reference(s):
Sample Type: chicken dorsal root ganglia

Application: Bioassay - growth cone collapse

Product: Recombinant Human Semaphorin 3A/Fc Chimeric Protein
Catalog # 1250-S3

Reference(s):
Sample Type: rat dorsal root ganglia

Semaphorin 6B

Application: Bioassay – growth cone collapse

Growth Cone Collapse by Semaphorin 6B. A: A fully extended dorsal root ganglion (DRG) growth cone growing on a laminin-coated tissue culture plate in the presence of recombinant human β1-NGF (Catalog # 256-GF). B: A collapsed DRG growth cone following treatment with recombinant human Semaphorin 6B/Fc (Catalog # 2094-50).
**NEURAL DEVELOPMENT**

### Sonic Hedgehog

**Application:** Bioassay - differentiation  
**Product:** Recombinant Human Sonic Hedgehog, N-Terminus (Shh-N) Protein  
Catalog # 1314-SH  
**Reference(s):**  
Sample Type: human multipotent adult progenitor cells

**Application:** Bioassay - oligodendrogenesis  
**Product:** Recombinant Mouse Sonic Hedgehog, N-Terminus (Shh-N) Protein  
Catalog # 461-SH  
**Reference(s):**  
Sample Type: rat spinal cord

**Application:** ELISA Kit  
**Product:** Mouse Sonic Hedgehog (Shh) DuoSet  
Catalog # DY461  
**Reference(s):**  
Sample Type: mouse neural progenitor cell supernatant

**Application:** In Vivo  
**Product:** Recombinant Human Sonic Hedgehog, N-Terminus (Shh-N) Protein  
Catalog # 1314-SH  
**Reference(s):**  
Sample Type: mouse

### Tenascin R

**Application:** Immunohistochemistry

*Tenascin Receptor Expression in Human Brainstem.* Tenascin R was detected in paraffin-embedded human brainstem (medulla) tissue sections using anti-human Tenascin R polyclonal antibody (Catalog # AF3865). Tissue was stained using the anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).

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TIMP-1
Application: Immunohistochemistry
Product: Rat TIMP-1 Polyclonal Antibody
Catalog # AF580
Reference(s):
Sample Type: rat brain

TrkB
Application: Bioassay - inhibition of putative TrkB ligands
Product: Recombinant Human TrkB Protein
Catalog # 397-TR
Reference(s):
Sample Type: human SH-SY5Y neuroblastoma cell line

Application: In Vivo & Bioassay - blocking of BDNF
Product: Recombinant Human TrkB/Fc Chimeric Protein
Catalog # 688-TK
Reference(s):
Sample Type: rat & rat hippocampal slice

TrkC
Application: Immunohistochemistry & Western Blot
Product: Human TrkC Monoclonal Antibody
Catalog # MAB373
Reference(s):
Sample Type: human neural stem cells & neural stem cell lysate

Application: Immunohistochemistry
Product: Mouse TrkC Polyclonal Antibody
Catalog # AF1404
Reference(s):
Tamura, S. et al. (2005) TRPV2, a capsaicin receptor homologue, is expressed predominantly in the neurotrophin-3-dependent subpopulation of primary sensory neurons. Neuroscience 130:223.
Sample Type: mouse dorsal root ganglia

TROY/TNFRSF19
Application: Flow Cytometry
Product: Human TROY/TNFRSF19 Polyclonal Antibody
Catalog # AF1548
Reference(s):
Sample Type: rat sciatic nerve cells

VEGF
Application: ELISA Kit
Product: Human VEGF Quantikine ELISA Kit
Catalog # DVE00
Reference(s):
Sample Type: human neuroblastoma supernatant

VEGF-B
Application: Bioassay - neurogenesis
Product: Recombinant Mouse VEGF-B 186 Protein
Catalog # 767-VE
Reference(s):
Sample Type: mouse embryonic-derived neuronal lineage cells

Application: Western Blot
Product: Mouse VEGF-B 167/186 Polyclonal Antibody
Catalog # AF590
Reference(s):
Sample Type: mouse brain homogenate

VEGF-C
Application: Immunohistochemistry
Product: Human VEGF-C Polyclonal Antibody
Catalog # AF752
Reference(s):
Sample Type: mouse eye

Wnt-3a
Application: Bioassay - proliferation
Product: Recombinant Mouse Wnt-3a Protein
Catalog # 1324-WN
Reference(s):
Sample Type: mouse retinal stem cells
### A2B5

**Application:** Immunohistochemistry

**Product:** Human/Mouse/Rat/Chicken A2B5 Monoclonal Antibody  
Catalog # MAB1416

**Reference(s):**  

**Sample Type:** human oligodendrocytes

#### A2B5 Expression in Human Progenitor Cells.  
A2B5 antigen was detected in human neural progenitor cells using anti-human/mouse/rat/chicken A2B5 monoclonal antibody (Catalog # MAB1416). Cells were stained with a rhodamine-conjugated goat anti-mouse secondary antibody (red) and counterstained with DAPI (blue).

### BMI-1

**Application:** Immunohistochemistry

**BMI-1 Expression in HeLa Cells.** BMI-1 was detected in HeLa cells using anti-human BMI-1 polyclonal antibody (Catalog # AF3334). Cells were stained using a NorthernLights-557 fluorochrome-labeled donkey anti-goat IgG secondary antibody (red; Catalog # NL001) and counterstained with DAPI (blue).

### CNDP1

**Application:** Immunohistochemistry

#### CNDP1 Expression in Neural Progenitor Cells.  
CNDP1 was detected in differentiated neural progenitor cells using anti-human CNDP1 monoclonal antibody (Catalog # MAB2489). Cells were stained with a rhodamine-conjugated anti-mouse secondary antibody (red) and counterstained with DAPI (blue).

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### Additional Information

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  - Ms: Multi Species  
  - P: Porcine  
  - Pr: Primate  
  - Rb: Rabbit  
  - Tg: T. gondii  
  - V: Viral  
  - X: Xenopus  
  - Z: Zebrafish

CXCR4

**Application:** Flow Cytometry

**Product:** Human CXCR4 Fluorescein-conjugated Monoclonal Antibody
Catalog # FAB170F

**Reference(s):**

**Sample Type:** human neural progenitor cells

**Product:** Human CXCR4 Monoclonal Antibody
Catalog # MAB173

**Reference(s):**

**Sample Type:** human U87.CD4 astroglioma cell line stabily expressing CXCR4 variants

**Application:** Immunohistochemistry

**Product:** Human CXCR4 Monoclonal Antibody
Catalog # MAB170

**Reference(s):**

**Sample Type:** human brain-derived progenitor cells


**Sample Type:** human mixed brain cells

FGF R1

**Application:** Bioassay - blocking FGF signaling effects

**Product:** Recombinant Human FGF R1 β (IIIc)/Fc Chimeric Protein
Catalog # 661-FR

**Reference(s):**

**Sample Type:** mouse neocortical cells

Galectin-1

**Application:** Immunohistochemistry & In Vivo

**Product:** Mouse Galectin-1 Polyclonal Antibody
Catalog # AF1245

**Reference(s):**

**Sample Type:** rat brain and mouse sciatic nerve & rat

**Application:** Western Blot

**Product:** Mouse Galectin-1 Monoclonal Antibody
Catalog # MAB1245

**Reference(s):**

**Sample Type:** mouse neuron lysate

MAG/Siglec-4a

**Application:** Bioassay - neurite outgrowth assay

**Product:** Recombinant Rat MAG/Siglec-4a/Fc Chimeric Protein
Catalog # 538-MG

**Reference(s):**

**Sample Type:** chicken dorsal root ganglia


**Sample Type:** mouse neurons

**Application:** Immunohistochemistry

**Application:** Immunoprecipitation

**Product:** Recombinant Rat MAG/Siglec-4a/Fc Chimeric Protein
Catalog # 538-MG

**Reference(s):**

**Sample Type:** African green monkey COS-7 kidney fibroblast cells transfected with human or mouse Nogo-66 Receptors -1, -2, or -3

**Application:** Western Blot

**Product:** Rat MAG/Siglec-4a Polyclonal Antibody
Catalog # AF538

**Reference(s):**

**Sample Type:** mouse sciatic nerve homogenate
Nestin

Application: Flow Cytometry

Product: Human Nestin Monoclonal Antibody
Catalog # MAB1259

Reference(s):
Sample Type: human neural precursor cells

Detection of Intracellular Nestin using Flow Cytometry. Differentiated rat cortical cells were stained with phycoerythrin (PE)-conjugated mouse anti-rat Nestin monoclonal antibody (Catalog # IC2736P; filled histogram). Staining with PE-conjugated isotype control (Catalog # IC003P; open histogram) highlights the specificity of the nestin antibody.

Application: Immunohistochemistry

Product: Human Nestin Monoclonal Antibody
Catalog # MAB1259

Reference(s):
Sample Type: human glioblastoma

Sample Type: human neural progenitor cells

Nestin Expression in Glioblastoma Cells. Nestin was detected in human glioblastoma cells using anti-human Nestin monoclonal antibody (Catalog # MAB1259). Cells were stained with a rhodamine-conjugated anti-mouse secondary antibody.
Nucleostemin

Application: Immunohistochemistry

Identification of Nucleostemin-Positive Stem Cells. Nucleostemin was detected in the nucleoli of human U2OS cells using anti-human/mouse/rat Nucleostemin polyclonal antibody (Catalog # AF1638). Cells were stained with a rhodamine-conjugated donkey anti-goat secondary antibody (red) and counterstained with DAPI (blue).

Oligodendrocyte Marker 04, continued

Application: Immunohistochemistry

Product: Oligodendrocyte Marker 04 Monoclonal Antibody
Catalog # MAB1326

Reference(s):
Sample Type: mouse embryonic stem cell-derived oligodendrocytes
Sample Type: mouse brain
Sample Type: human embryonic stem cell-derived neurospheres
Sample Type: rat and chicken oligodendrocytes

Oligodendrocyte Marker 01

Application: Immunohistochemistry

Product: Oligodendrocyte Marker 01 Monoclonal Antibody
Catalog # MAB1327

Reference(s):
Sample Type: human oligodendrocytes
Sample Type: human neural progenitor cells

Oligodendrocyte Marker 04

Application: Flow Cytometry

Detection of 04 Expression by Flow Cytometry. Differentiated rat cortical cells were stained with phycoerythrin(PE)-conjugated anti-human/mouse/rat/chicken 04 monoclonal antibody (Catalog # FAB1326P; filled histogram). Staining with PE-conjugated isotype control (Catalog # IC003P; open histogram) highlights the specificity of the 04 antibody.

PDGF Rα

Application: Immunohistochemistry

Product: Mouse PDGF Rα Polyclonal Antibody
Catalog # AF1062

Reference(s):
Sample Type: mouse brain
Sample Type: mouse brain, optic nerve, and spinal cord

Product: Human PDGF Rα Polyclonal Antibody
Catalog # AF-307-NA

Reference(s):
Sample Type: mouse retinal caps

Product: Human PDGF Rα Monoclonal Antibody
Catalog # MAB322

Reference(s):
Sample Type: human glial progenitor and primary hippocampal neuron cells

Application: Neutralization

Product: Human PDGF Rα Polyclonal Antibody
Catalog # AF-307-NA

Reference(s):
Sample Type: mouse coronal slice
**NEURAL STEM CELL & DIFFERENTIATION**

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<th>MONOCLONAL ANTIBODIES</th>
<th>POLYCLONAL ANTIBODIES</th>
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**SOX2**

**Application: Flow Cytometry**

Detection of Intracellular SOX2 in NTera2 Cells using Flow Cytometry. Human embryonal carcinoma NTera2 cells were stained with allophycocyanin(APC)-conjugated mouse anti-human SOX2 monoclonal antibody (Catalog # IC2018A; filled histogram). Staining with APC-conjugated isotype control (Catalog # IC003A; open histogram) highlights the specificity of the SOX2 antibody.

**Application: Immunohistochemistry**

**Product:** Human/Mouse SOX2 Monoclonal Antibody
Catalog # MAB2018

**Reference(s):**

Sample Type: rat neurospheres

**SOX2 Expression in NTera-2 Cells.** SOX2 was detected in human embryonal teratocarcinoma NTera-2 cells using anti-human SOX2 monoclonal antibody (Catalog # MAB2018). Cells were stained using Alexa Fluor® 568-conjugated anti-mouse secondary antibody (red). The nuclei were counterstained with DAPI (blue). Image courtesy of Jingli Cai and Mahendra Rao, National Institutes of Health.

**SOX10**

**Application: Immunohistochemistry**

**Product:** Human SOX10 Polyclonal Antibody
Catalog # AF2864

**Reference(s):**

Sample Type: human brain

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Primary Rat Cortical Stem Cells. *Ex vivo* expanded neural stem cells serve as excellent tools for researchers studying neural development and neurological disorders. R&D Systems now offers ready-to-use primary cortical stem cells isolated from E14.5 Sprague-Dawley rats. Every lot of R&D Systems Rat Cortical Stem Cells (Catalog # NSC001) exhibits a high level of nestin expression and has the capacity for multi-lineage differentiation (astrocytes, neurons, and oligodendrocytes). Our rigorous testing procedures ensure the highest level of quality and consistency from lot to lot. Depending on your research needs, our Rat Cortical Stem Cells can be optimally expanded as monolayers or neurospheres.


Alexa Fluor is a registered trademark of Molecular Probes, Inc.
**SSEA-4**

**Application:** Immunohistochemistry  
**Product:** Human/Mouse Stage-specific Embryonic Ag-4 Monoclonal Antibody  
Catalog # MAB1435  
**Reference(s):**  
**Sample Type:** human embryonic stem cells

**SSEA-4 Expression in Embryonic Stem Cells.** Human BG01V embryonic stem cells were cultured with recombinant human FGF basic (Catalog # 233-FB) in the presence (left) or absence (right) of Mouse Embryonic Fibroblast (MEF)-conditioned medium (Catalog # AR005). SSEA-4 and Oct-3/4 were detected using anti-human SSEA-4 monoclonal antibody (Catalog # MAB1435) and anti-human Oct-3/4 polyclonal antibody (Catalog # AF1759). Cells were stained with Alexa Fluor 568-conjugated anti-mouse secondary antibody (SSEA-4; red) and Alexa Fluor 488-conjugated anti-goat secondary antibody (Oct-3/4; green). Cells were counterstained with DAPI (blue). Image courtesy of Dr. Frank Soldner of the National Institutes of Health.

**TROY/TNFRSF19**

**Application:** Flow Cytometry  
**Product:** Human TROY/TNFRSF19 Polyclonal Antibody  
Catalog # AF1548  
**Reference(s):**  
**Sample Type:** human monocytes

**β-III Tubulin**

**Application:** Immunohistochemistry  
**Product:** Neuron-specific β-III Tubulin Monoclonal Antibody  
Catalog # MAB1195  
**Reference(s):**  
**Sample Type:** mouse retina  
**Sample Type:** mouse embryonic stem cell-derived neurons  
**Sample Type:** rat neurons

**Neural Stem Cell Functional Identification Kits**

The Human (Catalog # SC011) and Mouse/Rat (Catalog # SC013) Neural Stem Cell Functional Identification Kits contain specially formulated media supplements that can be used for the short-term maintenance and expansion of NSCs, and the differentiation of NSCs into astrocyte, neuron, and oligodendrocyte lineages. Also included is an antibody panel consisting of anti-Nestin, anti-Glial Fibrillary Acidic Protein (GFAP), anti-Neuron-specific β-III Tubulin, and anti-Oligodendrocyte Marker O4 to identify neural precursors, astrocytes, neurons, and oligodendrocytes, respectively.

**Identification of Neural Cell Populations.** Rat cortical stem cells (Catalog # NSC001) exhibit high expression of Nestin as detected with goat anti-rat nestin polyclonal antibody (Figure 1). Cells were stained with a Rhodamine Red-conjugated secondary antibody and counterstained with Fluoro Nissl Green. Distinct cell populations were identified in differentiated neural stem cells: Neurons were labeled detected using mouse anti-neuron-specific β-III Tubulin monoclonal antibody (Figure 2A; red). Astrocytes were labeled using mouse anti-human GFAP polyclonal antibody (Figure 2A; green). Oligodendrocytes were identified using mouse anti-Oligodendrocyte Marker O4 monoclonal antibody (Figure 2B). All primary antibodies are included in the Mouse/Rat Neural Stem Cell Functional Identification Kit (Catalog # SC011).
## NEURAL TRANSMISSION

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</table>

Key: H Human M Mouse R Rat B Bovine C Canine Ch Chicken G Cotton Rat D Drosophila E Equine F Feline Ms Multi Species P Porcine Pr Primate Rb Rabbit Tg T. pondi V Viral X Xenopus Z Zebrafish

### Adiponectin/Acrp30
**Application:** Bioassay - effect on release of pituitary hormones
**Product:** Recombinant Mouse gAdiponectin/gAcrp30 Protein
Catalog # 1119-AC

**Reference(s):**
Sample Type: rat anterior pituitary cells

### Agrin
**Application:** Bioassay - acetylcholine receptor (AChR) clustering
**Product:** Recombinant Rat Agrin Protein (see figure page 25)
Catalog # 550-AG

**Reference(s):**
Sample Type: mouse C2C12 myoblast cell line

### Akt
**Application:** Western Blot
**Product:** Human/Mouse/Rat Akt Pan Specific Monoclonal Antibody
Catalog # MAB2055

**Reference(s):**
Sample Type: rat neuron lysate

### BDNF
**Application:** In Vivo
**Product:** Recombinant Human BDNF Protein
Catalog # 248-BD

**Reference(s):**
Sample Type: rat

### CCK-A R
**Application:** Immunohistochemistry
**Product:** Human/Mouse/Rat CCK-A R Polyclonal Antibody
Catalog # AF2680

**Reference(s):**
Sample Type: rat brainstem
**CFTR**

*Application*: Immunohistochemistry  
*Product*: Human CFTR C-Terminus Monoclonal Antibody  
*Catalog #*: MAB25031  
*Sample Type*: human eye

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**Choline Acetyltransferase (ChAT)**

*Application*: Immunohistochemistry  
*Product*: Human ChAT Polyclonal Antibody  
*Catalog #*: AF3447  
*Sample Type*: mouse neuronal stem cells

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**CREB**

*Application*: Immunohistochemistry

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**ERK1/2**

*Application*: Immunohistochemistry  
*Product*: Human/Mouse Phosphorylated-ERK1/ERK2 Monoclonal Antibody  
*Catalog #*: AF1018  
*Sample Type*: mouse hippocampus

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**Frizzled-4**

*Application*: Immunohistochemistry  
*Product*: Human/Mouse Frizzled-4 Monoclonal Antibody  
*Catalog #*: MAB194  
*Sample Type*: mouse hippocampus

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**KOR**

*Application*: Immunohistochemistry  
*Product*: Human/Mouse KOR Monoclonal Antibody  
*Catalog #*: MAB38951  
*Sample Type*: mouse hippocampus
**Leptin**

**Application:** Bioassay - effect on peptide release  
**Product:** Recombinant Rat Leptin Protein  
Catalog # 598-LP  

**Reference(s):**  
Sample Type: rat hypothalamus

**Application:** Bioassay - effect on synaptic activity  
**Product:** Recombinant Human Leptin Protein  
Catalog # 398-LP  

**Reference(s):**  
Sample Type: rat hippocampal slice

**Application:** Immunohistochemistry

![Leptin Expression in Human Brain](image)

Leptin Expression in Human Brain. Leptin was detected in paraffin-embedded human brain sections using anti-human Leptin monoclonal antibody (Catalog # MAB398). Tissue was stained with the anti-mouse HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS002; brown) and counterstained with hematoxylin (blue).

**NF-H**

**Application:** Immunohistochemistry

![NF-H Expression in Human Brain](image)

NF-H Expression in Human Brain. NF-H was detected in paraffin-embedded human brain (cerebellum) tissue sections using the anti-human NF-H polyclonal antibody (Catalog # AF3108). Tissue was stained using anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).
**MIS/AMH**

**Application:** Immunohistochemistry  
**Product:** Rat MIS/AMH Polyclonal Antibody  
**Catalog #** AF1446

**Reference(s):**  
Sample Type: mouse lumbar spinal cord, ovaries, and testes

**MIS RII**

**Application:** Immunoprecipitation & Western blot  
**Product:** Rat MIS RII Polyclonal Antibody  
**Catalog #** AF1618

**Reference(s):**  
Sample Type: mouse lumbar spinal cord, ovary, and testical homogenates

**MuSK**

**Application:** Neutralization  
**Product:** Rat MuSK Polyclonal Antibody  
**Catalog #** AF562

**Reference(s):**  
Sample Type: mouse C2C12 myoblast cell line lysate, homogenized brain, and muscle

**NMDA R, NR2B Subunit**

**Application:** Western Blot  
**Product:** Recombinant Human NT4 Protein  
**Catalog #** 268-N4

**Reference(s):**  
Sample Type: mouse neurons and astrocytes

**MuSK mediates Agrin-Induced Clustering.**  
**A:** Myotubes differentiated from the C2C12 murine myoblast cell line were treated with recombinant rat Agrin (Catalog # 550-AG) to cluster acetylcholine receptors (AchR).  
**B:** Pre-treatment with goat anti-rat MuSK polyclonal antibody (Catalog # AF562) inhibits agrin-induced clustering. Cells were stained using a rhodamine is-bungarotoxin conjugate.

**Application:** Western Blot  
**Product:** Rat Polyclonal Antibody  
**Catalog #** AF562

**Reference(s):**  
Sample Type: rat brain, muscle, liver, lung, heart, and spleen tissue homogenates; mouse C2C12 myoblast cell line lysate

**NT-4**

**Application:** Bioassay - TrkB activation  
**Product:** Recombinant Human NT-4 Protein  
**Catalog #** 268-N4

**Reference(s):**  
Sample Type: mouse neurons and astrocytes

**Orexin A**

**Application:** Immunohistochemistry  
**Product:** Human/Mouse/Rat Orexin A Monoclonal Antibody  
**Catalog #** MAB763

**Reference(s):**  
Sample Type: mouse brain

**RAGE**

**Application:** Bioassay - Biacore binding assay  
**Product:** Recombinant Human RAGE/Fc Chimeric Protein  
**Catalog #** 1145-RG

**Reference(s):**  
Sample Type: recombinant human S100A4 and S100A12 proteins

**Phosphorylation of NMDA Receptor (NR2B Subunit) in Rat Hippocampus.**  
Rat hippocampal lysate was assessed by Western blot using rabbit anti-human/mouse/rat phospho-NMDA receptor NR2B Subunit (Y1336) polyclonal antibody (Catalog # PP5057). Immunolabeling is absent in samples pre-treated with λ-phosphatase (PPase), indicating the phosphospecificity of this antibody.
NEURAL TRANSMISSION

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Signal Transduction

| Akt             | H M R                 | H M R                 | H M R                 | H M R                 |                                |
| AMPKα1          | H M R                 | H M R                 | H M R                 |                                |                                |
| AMPKα2          | H M R                 | H M R                 | H M R                 |                                |                                |
| AMPKγ1          | H M R                 | H M R                 | H M R                 |                                |                                |
| CaM Kinase II   | H M R B X             |                       |                       |                                 |                                |
| cAMP            | Ms                    |                       |                       |                                 |                                |
| CREB            | H H M                 | H M R                 | H M R                 |                                |                                |
| ERK1/ERK2 *     | H M R                 | H M R                 | H M R                 |                                |                                |
| JAK1 *          | H M R                 | M R                   |                       |                                 |                                |
| JNK *           | H M R                 | H M R                 | H M R                 |                                |                                |
| p38α *          | H M R                 | H M R                 | H M R                 |                                |                                |
| PI 3-kinase p85α * | H M R               |                       |                       |                                 |                                |
| STAT3 *         | H H M                 | H M R                 | H M                  |                                |                                |

Key:
- H Human
- M Mouse
- R Rat
- B Bovine
- C Canine
- Ch Chicken
- G Cotton Rat
- D Drosophila
- E Equine
- F Feline
- M Multi Species
- P Porcine
- Pr Primate
- Rb Rabbit
- Tg T.gondii
- V viral
- X Xenopus
- Z Zebrafish

* Additional family members available.

Please visit www.RnDSystems.com/go/signaltransduction for complete listing of our signal transduction products.

Please visit www.RnDSystems.com/go/intracellularkinases for complete listing.

Substance P

**Application:** ELISA Kit

**Product:** Substance P Parameter Assay Kit
Catalog # KGE007

**Reference(s):**

**Sample Type:** Rat cerebral tissue perfusate

**Application:** Immunohistochemistry

Substance P in Human Spinal Cord. Substance P was detected in paraffin-embedded normal human spinal cord tissue sections using anti-human/mouse/rat Substance P monoclonal antibody (Catalog # MAB4375). Tissue was stained using the anti-mouse HRP-DAB Cell and Tissue Staining Kit (Catalog # CT5002; brown) and counterstained with hematoxylin (blue).

Synuclein-α

**Application:** Immunohistochemistry

**Product:** Human Synuclein-α Polyclonal Antibody
Catalog # AF1338

**Reference(s):**

**Sample Type:** Human brain

**Application:** ELISA Kit

**Product:** Mouse TNF-α/TNF/SF1A DuoSet
Catalog # DY410

**Reference(s):**

**Sample Type:** Mouse astrocyte supernatant

TNF-α/TNF/SF1A

**Application:** Bioassay - NMDA and TNF receptor activation

**Product:** Recombinant Mouse TNF-α/TNF/SF1A Protein
Catalog # 410-MT

**Reference(s):**

**Sample Type:** Mouse E16 neurons

**Application:** ELISA Kit

**Product:** Mouse TNF-α/TNF/SF1A DuoSet
Catalog # DY410

**Reference(s):**

**Sample Type:** Mouse astrocyte supernatant

Please visit www.RnDSystems.com/go/signaltransduction for complete listing of our signal transduction products.

Please visit www.RnDSystems.com/go/intracellularkinases for complete listing of our intracellular kinases products.
TNF RI/TNFRSF1A

Application: Bioassay - agonist activity

Product: Mouse TNF RI/TNFRSF1A Polyclonal Antibody
Catalog # AF-425-PB

Reference(s):
Sample Type: mouse E16 neurons

TNF RII/TNFRSF1B

Application: Flow Cytometry & Immunohistochemistry

Product: Mouse TNF RII/TNFRSF1B Polyclonal Antibody
Catalog # AF-426-PB

Reference(s):
Sample Type: rat dorsal root ganglia

TrkA

Application: Immunohistochemistry

TrkA Expression in Rat Dorsal Root Ganglion (DRG). TrkA was detected in cryostat sections of rat DRG using anti-rat TrkA polyclonal antibody (Catalog # AF1056). Tissue was stained using a Rhodamine Red-conjugated anti-goat secondary antibody. TrkA labeling is confined to the neuronal plasma membrane.

TrkB

Application: In Vivo & Bioassay - blocking of BDNF

Product: Recombinant Human TrkB/Fc Chimeric Protein
Catalog # 688-TK

Reference(s):
Sample Type: rat & rat hippocampal slice

PROTEOME-PROFILER™ HUMAN PHOSPHO-MAPK ARRAY

Kinases are integral parts of signal transduction cascades that regulate virtually all cellular activities. Therefore, it is of critical importance to have quality tools that make it easy to study kinase activity. R&D Systems Proteome Profiler Antibody Arrays are screening tools designed to detect the phosphorylation of multiple different proteins in a single sample. Our Phospho-MAPK Antibody Array (Catalog # ARY002) allows for the simultaneous detection of the relative phosphorylation of 18 different serine/threonine kinases and avoids time-consuming IP/Western blots. Each human Phospho-MAPK Antibody Array Kit contains buffers, detection antibodies, streptavidin-HRP, and 4 membranes spotted in duplicate with carefully selected, highly specific capture antibodies.

SIMULTANEOUSLY DETECT THE ACTIVITY OF THESE KINASES

ERK1 p38\( \alpha \) Akt1 ERK2 p38\( \beta \) Akt2 JNK1
p38\( \gamma \) Akt3 JNK2 p38\( \delta \) Akt pan JNK3 RSK1
GSK-3\( \alpha /\beta \) JNK pan RSK2 GSK-3\( \beta \) MSK2 p70 S6K HSP27

MAPK Phosphorylation in PC12 Cells. The human Phospho-MAPK Array (Catalog # ARY002) detects multiple phosphorylated kinases in lysates from untreated and sorbitol-treated cells. Array signals from scanned X-ray film images were analyzed using image analysis software.

Also available from R&D Systems is our Phospho-RTK Antibody Array (Catalog # ARY001) designed to simultaneously detect the relative phosphorylation of 42 different receptor tyrosine kinases (RTKs) in a single sample.

For more information, please visit www.RnDSystems.com/go/ProteomeProfiler
ADAM15
Application: Immunohistochemistry

ADAM15 Expression in Mouse Cerebellum. ADAM15 was detected in cryostat sections of mouse cerebellar Purkinje cells using anti-mouse ADAM15 polyclonal antibody (Catalog # AF945). Tissue was stained with Cy3-conjugated anti-goat antibody (red) and counterstained with FluoroNissl green.

Bag-1
Application: Immunohistochemistry

Product: Human Bag-1 Monoclonal Antibody
Catalog # MAB852

Reference(s):
Sample Type: human brain

Bax
Application: Western Blot

Product: Human/Mouse Bax Polyclonal Antibody
Catalog # AF820

Reference(s):
Sample Type: mouse frontal cortex homogenate

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<th>POLYCLONAL ANTIBODIES</th>
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Continued on page 30

Key: H Human M Mouse R Rat B Bovine Ca Carinpe Ch Chicken CR Cotton Rat D Drosophila E Equine F Feline Ms Multi Species P Porcine Pp Primate Rb Rabbit Tg T. gondii V Viral X Xenopus Z Zebrafish


Cy is a trademark of GE Healthcare.
Caspase-3

**Application:** Bioassay - caspase activity assay  
**Product:** Caspase-3 Colorimetric Assay Kit  
**Catalog #** BF3100  
**Sample Type:** rat brain homogenate

**Application:** Immunohistochemistry  
**Product:** Human/Mouse Active Caspase-3 Polyclonal Antibody  
**Catalog #** AF835  
**Sample Type:** rat brain

CCL2/MCP-1, continued

**Application:** Immunohistochemistry  
**Product:** Mouse CCL2/JE/MCP-1 Polyclonal Antibody  
**Catalog #** AF-479-NA  
**Sample Type:** mouse brain

Caspase-10

**Application:** Western Blot  
**Product:** Human Caspase-10/a (Mch4) Monoclonal Antibody  
**Catalog #** MAB8834  
**Sample Type:** mouse brain homogenate

CCL2/MCP-1

**Application:** Bioassay - membrane potential assay  
**Product:** Recombinant Mouse CCL2/JE/MCP-1 Protein  
**Catalog #** 479-JE  
**Sample Type:** mouse dorsal root ganglia

**Application:** ELISA Kit  
**Product:** Human CCL2/MCP-1 Quantikine ELISA Kit  
**Catalog #** DCP00  
**Sample Type:** human brain homogenate

**Product:** Mouse CCL2/JE/MCP-1 Quantikine ELISA Kit  
**Catalog #** MJE00  
**Sample Type:** mouse brain homogenate

CCL3/MIP-1α

**Application:** Immunohistochemistry  
**Product:** Mouse CCL3/MIP-1α Polyclonal Antibody  
**Catalog #** AF-450-NA  
**Sample Type:** mouse brain

CCL4/MIP-1β

**Application:** Immunohistochemistry  
**Product:** Human CCL4/MIP-1β Biotinylated Polyclonal Antibody  
**Catalog #** BAF271  
**Sample Type:** human SK-N-SH neuroblastoma cell line and brain tissue

CCL5/RANTES

**Application:** ELISA Development  
**Product:** Mouse CCL5/RANTES Biotinylated Polyclonal Antibody  
**Catalog #** BAF478  
**Sample Type:** rat microglia supernatant
**NEURODEGENERATIVE DISEASE & NEUROINFLAMMATION**

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Key: H Human, M Mouse, R Rat, B Bosine, C Canine, Ch Chicken, Cr Cotton Rat, D Drosophila, E Equine, F Feline, Ms Multi Species, P Porcine, Pr Primate, Rb Rabbit, Tg T. gondii, V Viral, X Xenopus, Z Zebrafish


**CCL21/6Ckine**

**Application:** Western Blot

**Product:** Mouse CCL21/6Ckine Polyclonal Antibody
Catalog # AF457

**Reference(s):**
Sample Type: mouse spinal cord homogenate

**CCR2**

**Application:** Immunohistochemistry

**Product:** Human CCR2 Monoclonal Antibody
Catalog # MAB150

**Reference(s):**
Sample Type: human microglia

**CCR5**

**Application:** Flow Cytometry

**Product:** Human CCR5 Fluorescein-conjugated Monoclonal Antibody
Catalog # FAB180F

**Reference(s):**
Sample Type: human neural progenitor cells

**Application:** Immunohistochemistry

**Product:** Human CCR5 Monoclonal Antibody
Catalog # MAB181

**Reference(s):**
Sample Type: human embryonic mixed brain cells

**CD14**

**Application:** ELISA Development

**Product:** Mouse CD14 Polyclonal Antibody
Catalog # AF982

**Reference(s):**
Sample Type: mouse neuron lysate

**CXCL8/IL-8**

**Application:** ELISA Kit

**Product:** Human CXCL8/IL-8 Quantikine ELISA Kit
Catalog # D8000C

**Reference(s):**
Sample Type: human CRT-MG astroglia cell line supernatant
**CXCR1/IL-8 RA**

**Application:** Flow Cytometry  
**Product:** Human CXCR1/IL-8 RA Monoclonal Antibody  
**Catalog #:** MAB330  
**Reference(s):**  
Sample Type: human neuroblastoma cells  
**Application:** Immunohistochemistry  
**Product:** Human CXCR1/IL-8 RA Monoclonal Antibody  
**Catalog #:** MAB330  
**Reference(s):**  
Sample Type: guinea pig Müller glial cells

**CXCL10/IP-10/CRG-2**

**Application:** ELISA Kit  
**Product:** Human CXCL10/IP-10 DuoSet  
**Catalog #:** DY266  
**Reference(s):**  
Sample Type: human brain astrocyte supernatant  
**Product:** Mouse CXCL10/IP-10/CRG-2 Quantikine ELISA Kit  
**Catalog #:** MCK100  
**Reference(s):**  
Sample Type: mouse central nervous system tumor cell supernatant  
**Application:** Immunohistochemistry  
**Product:** Mouse CXCL10/IP-10/CRG-2 Biotinylated Polyclonal Antibody  
**Catalog #:** BAF466  
**Reference(s):**  
Sample Type: mouse brain

**CXCL12/SDF-1**

**Application:** Bioassay - calcium flux assay and activation of CXCR4  
**Product:** Recombinant Human/Rhesus Macaque/Feline CXCL12/SDF-1α Protein  
**Catalog #:** 350-NS  
**Reference(s):**  
Sample Type: human SK-N-SH neuroblastoma cell line  
**Application:** Immunohistochemistry  
**Product:** Human CXCL12/SDF-1 Polyclonal Antibody  
**Catalog #:** AF-310-NA  
**Reference(s):**  
Sample Type: human brain (multiple sclerosis active lesions)

**CXCL13/BLC/BCA-1**

**Application:** Immunohistochemistry  
**Product:** Mouse CXCL13/BLC/BCA-1 Polyclonal Antibody  
**Catalog #:** AF470  
**Reference(s):**  
Sample Type: mouse brain  
**Application:** Western Blot  
**Product:** Mouse CXCL13/BLC/BCA-1 Polyclonal Antibody  
**Catalog #:** AF470  
**Reference(s):**  
Sample Type: mouse spinal cord homogenate

**IFN-γ**

**Application:** Bioassay - oligodendrogenesis  
**Product:** Recombinant Mouse IFN-γ Protein  
**Catalog #:** 485-MI  
**Reference(s):**  
Sample Type: mouse microglia/neural progenitor cell co-culture  
**Application:** Bioassay - cell culture  
**Product:** Recombinant Mouse IFN-γ Protein  
**Catalog #:** 485-MI  
**Reference(s):**  
Sample Type: mouse microglia and neuronal cells  
**Application:** ELISA Kit  
**Product:** Rat IFN-γ DuoSet  
**Catalog #:** DYS85  
**Reference(s):**  
Sample Type: rat hippocampal and cortical homogenates, and glial cell supernatant  
**Application:** In Vivo  
**Product:** Recombinant Mouse IFN-γ Protein  
**Catalog #:** 485-MI  
**Reference(s):**  
Sample Type: mouse
# NEURODEGENERATIVE DISEASE & NEUROINFLAMMATION

## NEUROINFLAMMATION

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<thead>
<tr>
<th>MOLECULE</th>
<th>MONOSPECIFIC ANTIBODIES</th>
<th>POLYCLONAL ANTIBODIES</th>
<th>CONJUGATED ANTIBODIES</th>
<th>RECOMBINANT &amp; NATURAL PROTEINS</th>
<th>ELISA/RIA Kits</th>
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Key: H Human, M Mouse, R Rat, B Bovine, Ca Canine, Ch Chicken, CR Cotton Rat, D Drosophila, E Equine, F Feline, M Multi Species, P Porcine, Pr Primate, Rb Rabbit, Tg T. gondii, V Viral, X Xenopus, Z Zebrafish

Please visit www.RnDSytems.com for complete listing of inflammation-related molecules.


* Additional family members available. Please visit www.RnDSytems.com/go/Cytokine for complete listing.

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**IL-1 β/IL-1F2**

**Application: ELISA Development**

**Product:** Rat IL-1 β/IL-1F2 Biotinylated Polyclonal Antibody

Catalog # BAF501

**Reference(s):**


Sample Type: rat brain homogenate

**Application: ELISA Kit**

**Product:** Rat IL-1 β/IL-1F2 DuoSet

Catalog # DYS01

**Reference(s):**


Sample Type: rat astrocyte supernatant

**Application: Immunohistochemistry**

**Product:** Rat IL-1 β/IL-1F2 Polyclonal Antibody

Catalog # AF-501-NA

**Reference(s):**


Sample Type: rat brain

**Application: Western Blot**

**Product:** Mouse IL-1 β/IL-1F2 Fluorokine MAP

Catalog # LUM401

**Reference(s):**


Sample Type: rat brain homogenate

For research use only. Not for use in diagnostic procedures.
IL-1 RI

**Application:** Western Blot  
**Product:** Mouse IL-1 RI Monoclonal Antibody  
Catalog # MAB7712  
**Reference(s):**  
Sample Type: mouse neuron and glial cell lysate

IL-1ra/IL-1F3

**Application:** ELISA Kit  
**Product:** Mouse IL-1ra/IL-1F3 Quantikine ELISA Kit  
Catalog # MRA00  
**Reference(s):**  
Sample Type: mouse hippocampal homogenate

**Application:** Immunohistochemistry  
**Product:** Mouse IL-1ra/IL-1F3 Polyclonal Antibody  
Catalog # AF-480-NA  
**Reference(s):**  
Sample Type: rat brain

IL-4

**Application:** Bioassay - differentiation  
**Product:** Recombinant Mouse IL-4 Protein  
Catalog # 404-ML  
**Reference(s):**  
Sample Type: mouse microglia and neural progenitor cell co-culture

**Application:** ELISA Development  
**Product:** Rat IL-4 Monoclonal Antibody  
Catalog # MAB8504  
**Reference(s):**  
Sample Type: rat brain homogenate

IL-6

**Application:** ELISA Kit  
**Product:** Mouse IL-6 DuoSet  
Catalog # DY406  
**Reference(s):**  
Sample Type: mouse N9 microglial cell line supernatant

**Product:** Mouse IL-6 Quantikine ELISA Kit  
Catalog # M6000B  
**Reference(s):**  
Sample Type: mouse organotypic hippocampal slice culture supernatant

**Product:** Rat IL-6 DuoSet  
Catalog # DY506  
**Reference(s):**  
Sample Type: rat astrocyte supernatant

IL-6 R

**Application:** ELISA Kit  
**Product:** Human IL-6 sR Quantikine ELISA Kit  
Catalog # DR600  
**Reference(s):**  
Aronica, E. et al. (2005) Activation of metabotropic glutamate receptor 3 enhances interleukin (IL)-1β-stimulated release of IL-6 in cultured human astrocytes. Neuroscience 130:927.  
Sample Type: human astrocyte cell culture supernatant

IL-10

**Application:** ELISA Kit  
**Product:** Mouse IL-10 Quantikine ELISA Kit  
Catalog # M1000  
**Reference(s):**  
Sample Type: mouse hypothalamus homogenate

**Application:** Multiplex assay  
**Product:** Mouse IL-10 Fluorokine MAP  
Catalog # LUM417  
**Reference(s):**  
Sample Type: mouse serum and fetal brain homogenate
NEURODEGENERATIVE DISEASE & NEUROINFLAMMATION

IL-18/IL-1F4
Application: Bioassay - inhibition of long-term potentiation
Product: Recombinant Rat IL-18/IL-1F4 Protein
Catalog # 521-RL
Reference(s):
Sample Type: rat hippocampus
Application: In Vivo
Product: Recombinant Human IL-18 BPa/Fc Chimeric Protein
Catalog # 119-BP
Reference(s):
Sample Type: rat
Application: Western Blot
Product: Rat IL-18/IL-1F4 Polyclonal Antibody
Catalog # AF521
Reference(s):
Sample Type: rat brain homogenate

IL-18 Rα/IL-1 R5
Application: Immunohistochemistry
Product: Mouse IL-18 Rα/IL-1 R5 Polyclonal Antibody
Catalog # AF521
Reference(s):
Sample Type: rat brain homogenate
Application: Western Blot
Product: Human IL-18 Rα/IL-1 R5 Polyclonal Antibody
Catalog # AF840
Reference(s):
Sample Type: rat brain homogenate

IL-23
Application: Immunohistochemistry
Product: Mouse IL-23 p19 Polyclonal Antibody
Catalog # AF1619
Reference(s):
Sample Type: mouse brain and spinal cord

IL-28A
Application: Bioassay - proliferation and STAT phosphorylation
Product: Recombinant Human IL-28A/IFN-λ 2 Protein
Catalog # 1587-IL
Reference(s):
Sample Type: human BDN1 pancreatic neuroendocrine tumor cell line

MOG
Application: Western blot
Product: Mouse MOG Polyclonal Antibody
Catalog # AF2439
Reference(s):
Sample Type: MOG-transfected W3 cell lysates
Application: Immunohistochemistry
MOG Expression in Mouse Cortex. MOG was detected in a cryostat section of mouse cortex using anti-mouse MOG polyclonal antibody (Catalog # AF2439). Tissue was stained using the anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008) and counterstained with hematoxylin.

NT-3
Application: ELISA to measure release rate of NT-3 from fibrin gels
Product: Human NT-3 DuoSet
Catalog # DY267
Reference(s):
Sample Type: recombinant human NT-3 protein
**Osteopontin**

**Application:** Immunohistochemistry  
**Product:** Mouse Osteopontin Polyclonal Antibody  
Catalog # AF808  

**Reference(s):**  
Sample Type: mouse brain

**PARK-7/DJ-1**

**Application:** Immunohistochemistry

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**RAGE**

**Application:** Immunohistochemistry  
**Product:** Human RAGE Polyclonal Antibody  
Catalog # AF1145  

**Reference(s):**  
Sample Type: human eye

---

**α-Secretase**

**Application:** Bioassay - enzyme activity  
**Product:** α-Secretase Activity Kit  
Catalog # FP001  

**Reference(s):**  
Sample Type: mouse brain cortex homogenate  
Sample Type: mouse neocortex homogenate and neuron lysate

---

**β-Secretase**

**Application:** Bioassay - enzyme activity  
**Product:** β-Secretase Activity Kit  
Catalog # FP002  

**Reference(s):**  
Sample Type: human brain homogenate and recombinant human BACE-1 protein  
Sample Type: mouse N2a and human SK-N-SH neuroblastoma cell line lysates  
Sample Type: mouse brain homogenate  
Sample Type: human temporal cortex homogenate

---

**γ-Secretase**

**Application:** Bioassay - enzyme activity  
**Product:** γ-Secretase Activity Kit  
Catalog # FP003  

**Reference(s):**  
Sample Type: mouse brain homogenate  
Sample Type: mouse neocortex homogenate and neuronal lysate
**NEURODEGENERATIVE DISEASE & NEUROINFLAMMATION**

**Tau**

*Application: Immunohistochemistry*

**TNF-α/TNFSF1A**

*Application: Immunohistochemistry*

*Product:* Rat TNF-α/TNFSF1A Polyclonal Antibody
Catalog # AF-S10-NA

*Reference(s):*

*Sample Type: rat astrocytes*

*Application: Multiplex assay*

*Product:* Mouse TNF-α/TNFSF1A Fluorokine MAP
Catalog # LUM410

*Reference(s):*

*Sample Type: mouse serum and fetal brain homogenate*

*Application: Western Blot*

*Product:* Mouse TNF-α/TNFSF1A Monoclonal Antibody
Catalog # MAB410

*Reference(s):*
Figiel, I. & K. Dzwonek (2007) TNF-α and TNF receptor 1 expression in the mixed neuronal-glial cultures of hippocampal dentate gyrus exposed to glutamate or trimethyltin. Brain Res. 1131:17.

*Sample Type: rat hippocampal dentate gyrus homogenate*

**TNF-β/TNFSF1B**

*Application: Immunohistochemistry*

*Product:* Human TNF-β/TNFSF1B Polyclonal Antibody
Catalog # AF-211-NA

*Reference(s):*

*Sample Type: human brain*

**TNF RI/TNFRSF1A**

*Application: ELISA*

*Product:* Human TNF RI/TNFRSF1A Quantikine ELISA Kit
Catalog # DRT100

*Reference(s):*

*Sample Type: human EDTA plasma*

**TRAIL/TNFSF10**

*Application: Bioassay - cell viability*

*Product:* Recombinant Human TRAIL/TNFSF10 Protein
Catalog # 375-TL

*Reference(s):*

*Sample Type: human astrocytes and U343MG glioma cell line*

*Application: Immunohistochemistry*

*Product:* Human TRAIL/TNFSF10 Polyclonal Antibody
Catalog # AF375

*Reference(s):*

*Sample Type: human brain*

**TRAIL R2/TNFRSF10B**

*Application: Flow Cytometry*

*Product:* Human TRAIL R2/TNFRSF10B Polyclonal Antibody
Catalog # AF631

*Reference(s):*

*Sample Type: human neural progenitor cells*
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R&D Systems is a leading supplier of cell biology reagents with over 30 years of experience manufacturing specialty biological products that serve the basic research, clinical research, and clinical diagnostic markets. We offer products for the study of cancer, developmental biology, endocrinology, glycochemistry, immunology, neuroscience, proteases, signal transduction, and stem cell research.

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  Colorimetric immunoassays for in vitro diagnostic use
- **QuantiGlo®**
  Chemiluminescent ELISAs
- **Parameter™**
  Small molecule microplate-based competitive assays
- **Surveyor™ IC (Intracellular)**
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  Reagents for the development of ELISAs for cytokines, growth factors, and related molecules
- **DuoSet IC (Intracellular) ELISA Development Systems**
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- Chemokines
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- Receptors
- Proteases
- Adhesion Molecules
- Neurotrophic Factors
- Developmental Molecules
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- Differentiation Kits
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- & eosinophils
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- Extracellular matrix-coated plates

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- Intracellular staining

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- Transcription factor activity assays
- Phosphatase activity assays

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- Caspase activity assays
- Annexin V detection
- Mitochondrial membrane potential disruption
- DNA fragmentation detection kits
- PARP activity assay
- SOD activity assay
- TUNEL assays
- MTT & XTT Cell Proliferation/Viability Assay

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R&D Systems ANTIBODIES

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<td>Bovine</td>
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Applications

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<td>Western Blot</td>
<td>Matched Antibody Pairs for ELISA Development</td>
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<td>Flow Cytometry (Cell Surface or Intracellular)</td>
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Antibody Conjugates

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<th>Others</th>
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<td>NorthernLights - 557 (557/575)</td>
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<td>NorthernLights - 637 (637/658)</td>
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<td>Fluorescein (CSF) (492/517)</td>
<td>Phycoerythrin (PE) (565/575)</td>
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NorthernLights™

A new line of fluorochrome-conjugates for IHC & Flow Cytometry

Confocal Images of Triple Immunofluorescence in Mouse Brainstem. Cryostat sections of mouse brainstem were labeled with mouse anti-Orexin B monoclonal antibody (Catalog # MAB734), rabbit anti-human/mouse/rat p38α polyclonal antibody (Catalog # AF8691), and goat anti-mouse Integrin β1 (Catalog #AF2405). Tissue was stained with NorthernLights (NL)- conjugated secondary polyclonal antibodies: NL-493 donkey anti-rabbit (Catalog # NL006), NL-557 donkey anti-mouse (Catalog # NL007), and NL-637 donkey anti-goat (Catalog # NL008). Immunohistochemical image of integrin β1 expression is pseudo-colored for presentation.

Orexin B

Integrin β1

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R&D Systems also offers Antibody Isotype controls.
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