

Neurotrophins, Receptors, & Associated Molecules

The four Neurotrophin receptors, TrkA, TrkB, TrkC, and NGF R/p75, are involved in an array of nervous system activities. These include regulating neuronal survival, neurite outgrowth, and synaptic plasticity. Their activities are complex and often context-dependent. This partly results from differences in the activities of pro-Neurotrophins versus the mature proteins.

For instance, Pro-neurotrophins preferentially bind NGF R in combination with the co-receptor Sortilin, and may be involved in apoptotic responses or the development of long-term depression (LTD). In contrast, the Trks preferentially bind mature Neurotrophins and are involved in pro-survival responses and long-term potentiation (LTP). In addition, NGF R and co-receptors Nogo R and Lingo-1 act as a receptor complex for the myelin-associated, neurite outgrowth-inhibiting proteins Nogo-A, MAG, and OMgp. R&D Systems offers a range of tools to study the activities of the Neurotrophins, receptors, and associated molecules.

Neurotrophin-related Products			
MOLECULE	ANTIBODIES	PROTEINS	ELISAs/ASSAYS
BDNF	H	H	H
Lingo-1	H		
Lingo-2	H		
MAG	R	R	
NGF R/p75	H M	H M	
β-NGF	H M	H M R	H R
Nogo Receptor	H M	H M	
Nogo-A	R	H R	
NT-3	H	H	H
NT-4	H	H M	H
OMgp	H M	H M	
SorCS1	H		
SorCS3	H M		
Sortilin	H M	H M	
TrkA	H M R	H R	H
TrkB	H M	H M	H
TrkC	H M	H M	

Key: H Human M Mouse R Rat

Nogo-A Inhibition of Neurite Outgrowth

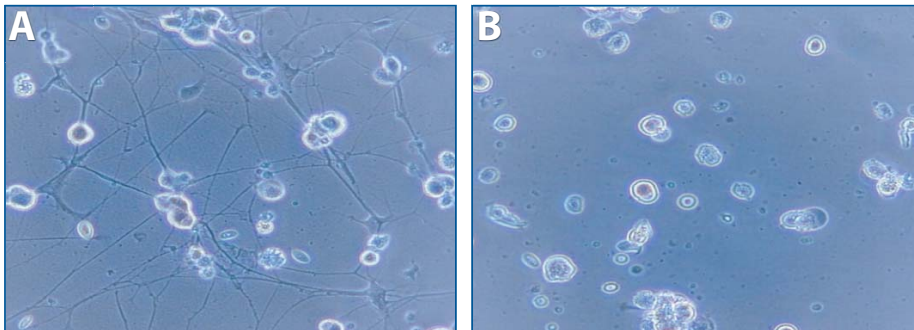


Figure 1. Nogo-A inhibits neurite outgrowth. (A) Embryonic chick dorsal root ganglion (DRG) cells exhibit neurite outgrowth when cultured on nitrocellulose-coated plates treated with laminin. (B) Pre-coating similar plates with R&D Systems recombinant rat Nogo-A (Catalog # 2445-NG; 100 mg/mL) completely inhibits neurite outgrowth.

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TrkA in Rat DRG Neurons

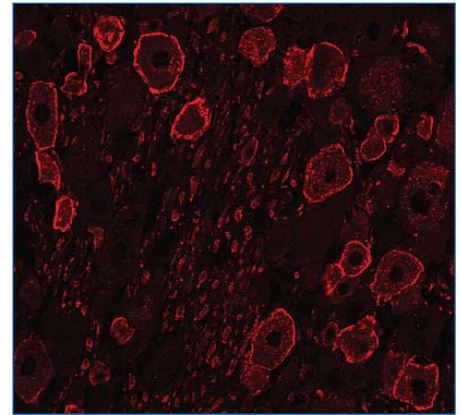


Figure 2. Detection of TrkA receptor in rat DRG neurons using R&D Systems goat anti-rat TrkA receptor affinity-purified antibody (Catalog # AF1056). Tissues were stained using donkey anti-goat secondary antibodies conjugated to Rhodamine Red™ X (red). TrkA receptor labeling is confined to the plasma membrane of DRG neurons.

NT-3 in Rat Cerebellum

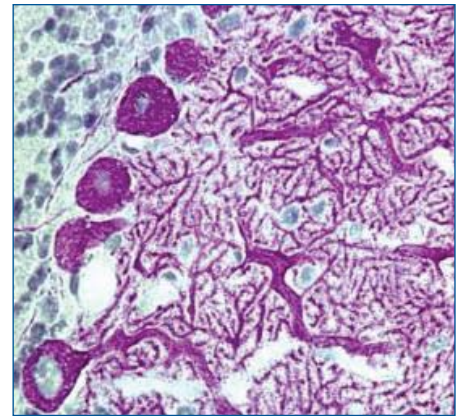


Figure 3. Detection of Neurotrophin-3 (NT-3) in cryostat sections of rat cerebellum using R&D Systems goat anti-human affinity-purified polyclonal antibody (Catalog # AF-267-NA). Tissues were stained with a biotinylated donkey anti-goat secondary antibody (Jackson ImmunoResearch Laboratories) followed by the avidin-biotin technique (Vectastain® Elite ABC Peroxidase Kit, Vector Labs; red). Tissues were counterstained with hematoxylin (blue).

MAG in Rat Cerebellum

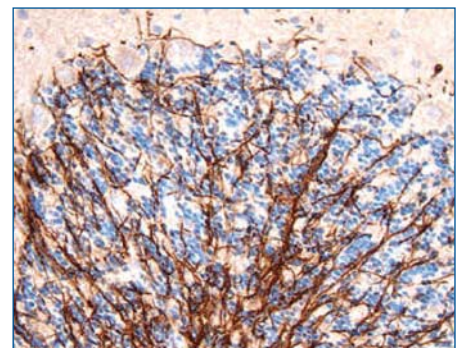


Figure 4. Detection of Myelin-associated Glycoprotein (MAG) in cryostat sections of rat cerebellum using R&D Systems goat anti-rat affinity-purified polyclonal antibody (Catalog # AF538). Tissues were stained with R&D Systems anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown). Tissues were counterstained with hematoxylin (blue).