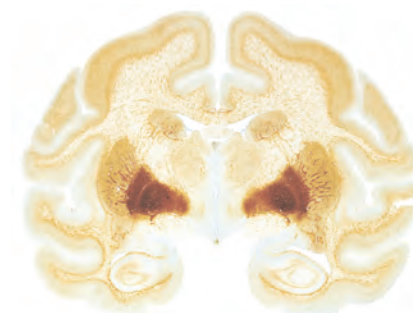
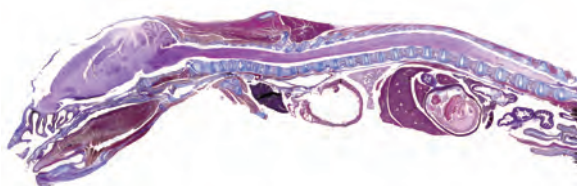
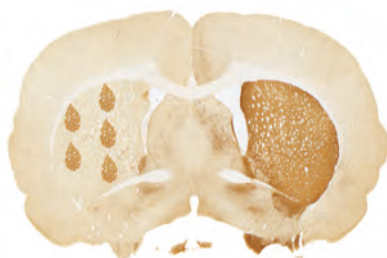
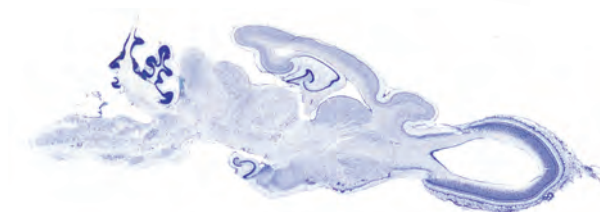
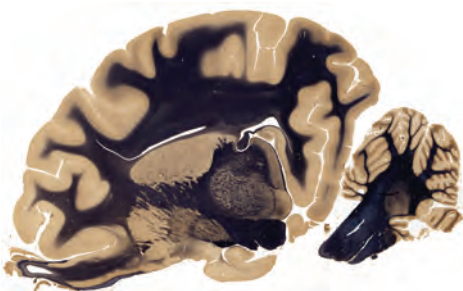
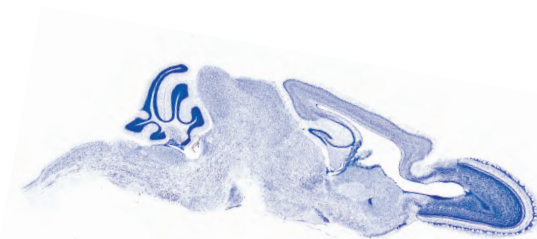
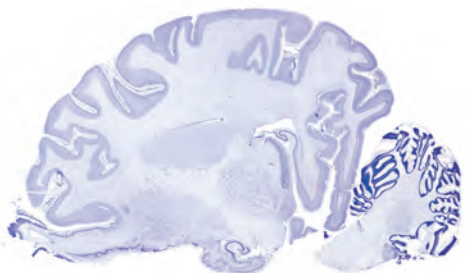




2006 Calendar



NEUROSCIENCE ASSOCIATES

10915 Lake Ridge Drive Knoxville, TN 37934

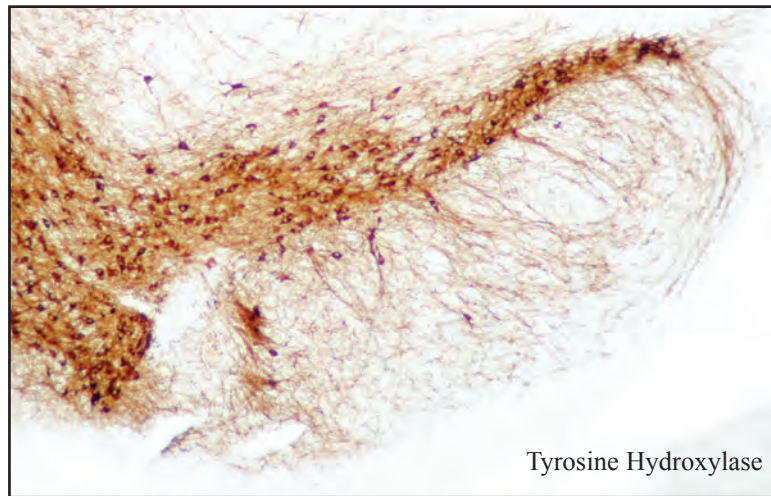
Sales 866-341-8191 or 540-341-8191

www.NSALabs.com

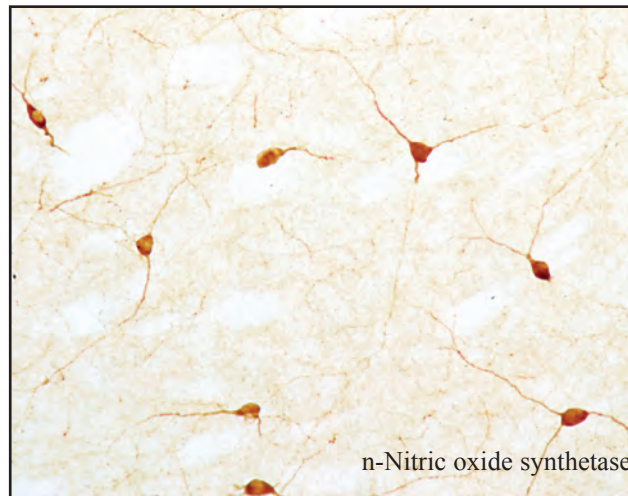
Info@NSALabs.com

Lab 800-972-3401 or 865-675-2245

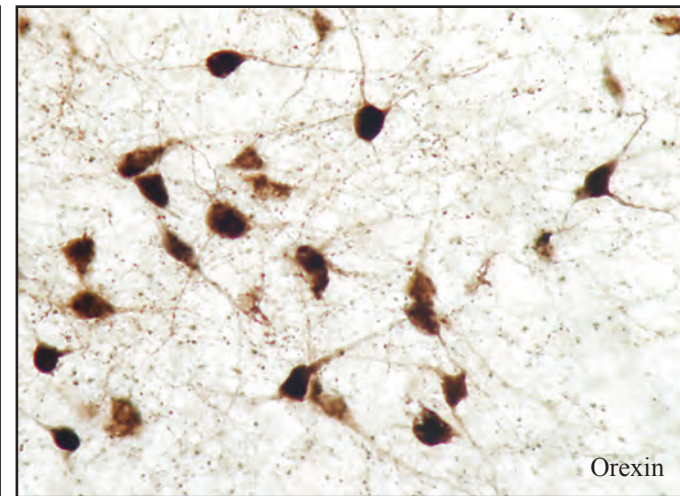
Dendrites, Dendrites, Dendrites...



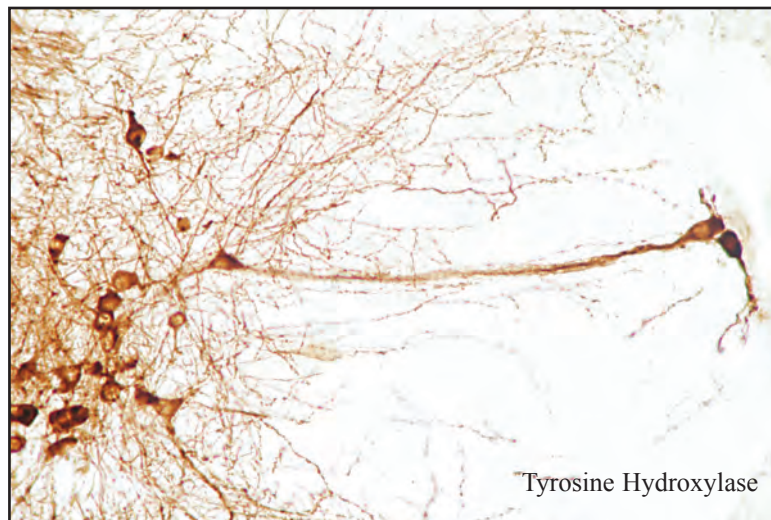
Tyrosine Hydroxylase



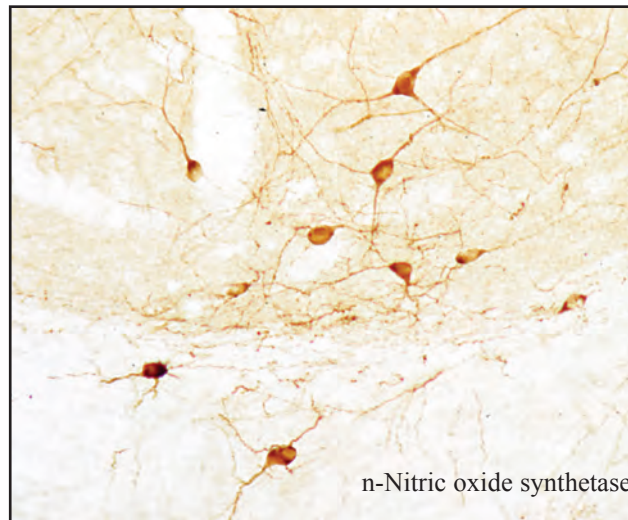
n-Nitric oxide synthetase



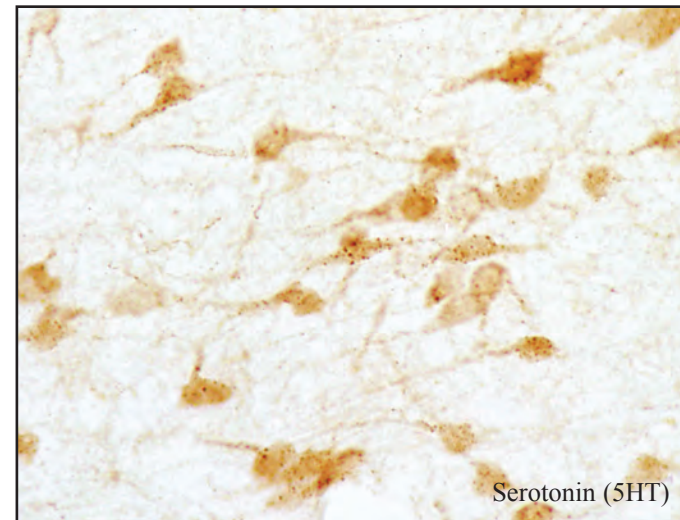
Orexin



Tyrosine Hydroxylase



n-Nitric oxide synthetase



Serotonin (5HT)

Antibody staining for Tyrosine Hydroxylase in rat substantia nigra (top & bottom). The top low power view shows the dendrites from the pars compacta streaming into the reticulata.

Neuronal nitric oxide synthetase antibody staining in neurons of the dorsal (top) and ventral (bottom) rat striatum near the anterior commissure.

Orexin antibody staining in the top image shows dense clusters of neurons in rat hypothalamus. Bottom: Antibody staining of serotonin in the raphe.



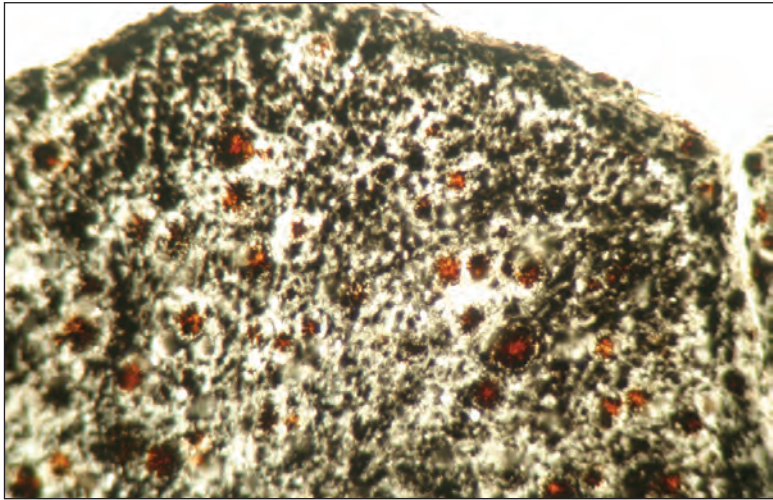
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

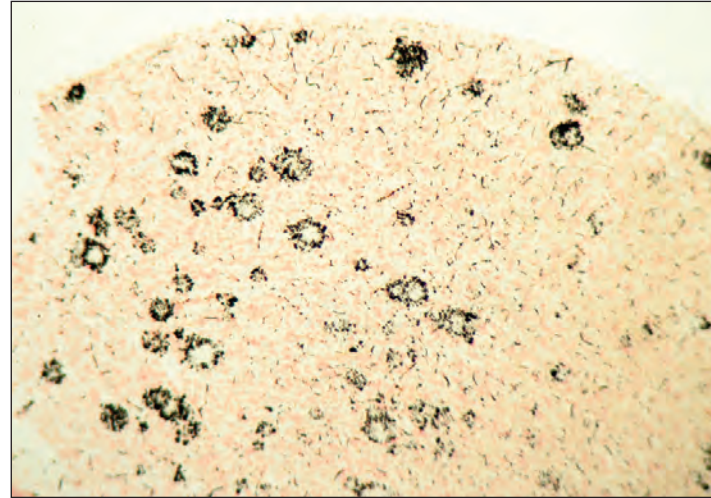
THE Neurotoxicity Testing Center



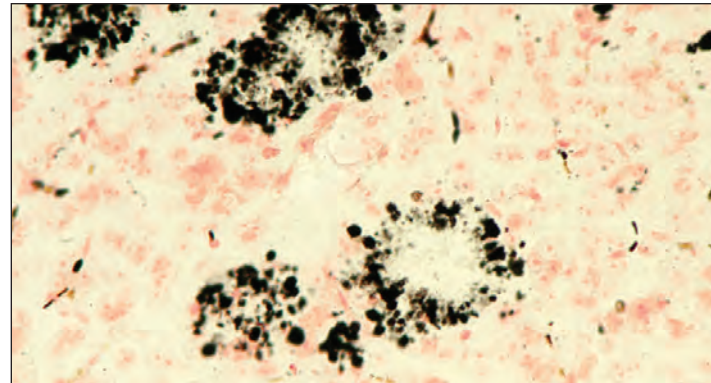
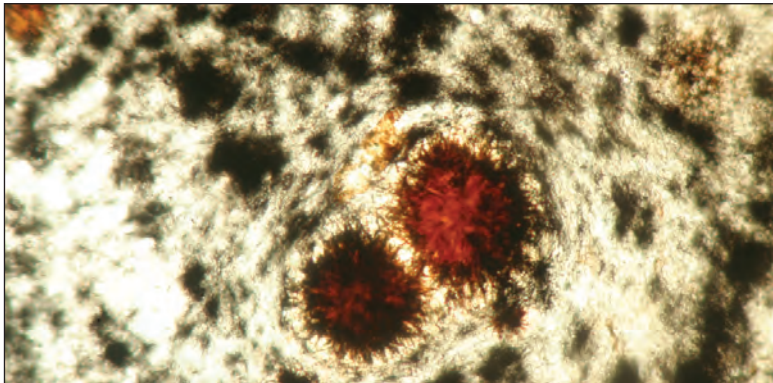
Disintegrative Degeneration Staining in Alzheimer's Disease Mouse Model vs Campbell-Switzer Stain for Plaques



Campbell- Switzer stain



Amino Cupric Silver
stain of deOlmos



Amyloid plaques are in very high density in this aged AD mouse model (PS1/APP) with fibrillar amyloid visible as amber in the Campbell-Switzer stained section. The disintegrative degeneration stain of deOlmos reveals globular impregnated profiles that correspond to the plaques with fibrillar (amber) amyloid but not the black diffuse ('preamyloid') plaques. At higher magnifications the locations of the globular profiles can be seen as vacancies adjacent to the amber centers. Recent work describes the profiles as dystrophic neurites; Brendza, et.al. *JCompNeurol.* 456:375, 2003.



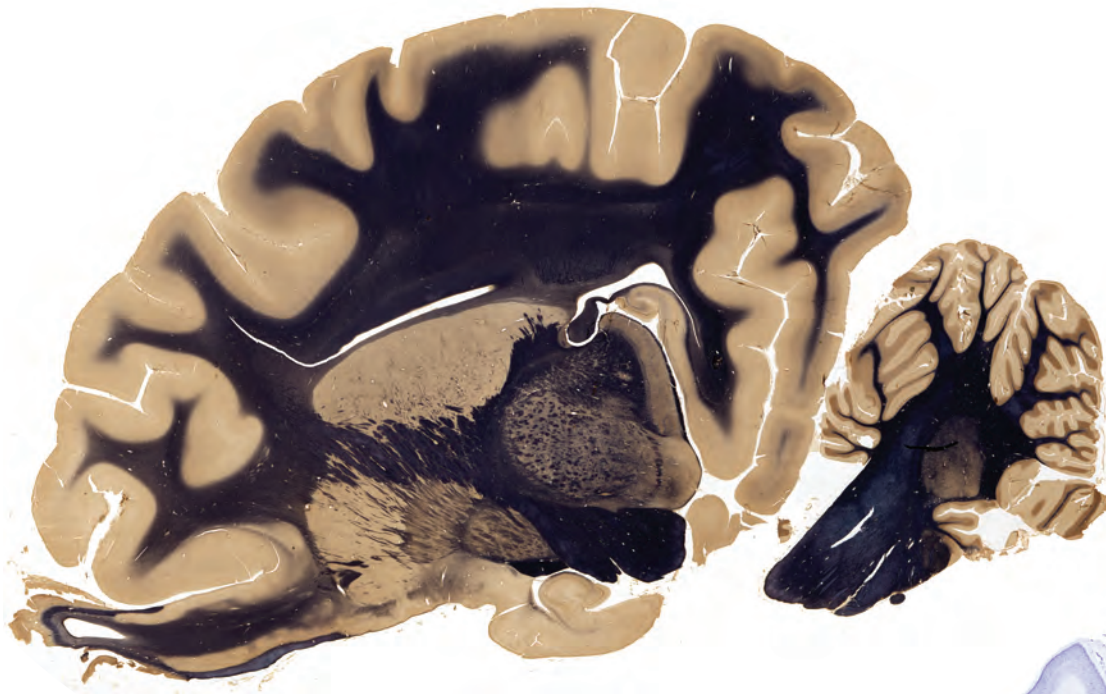
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

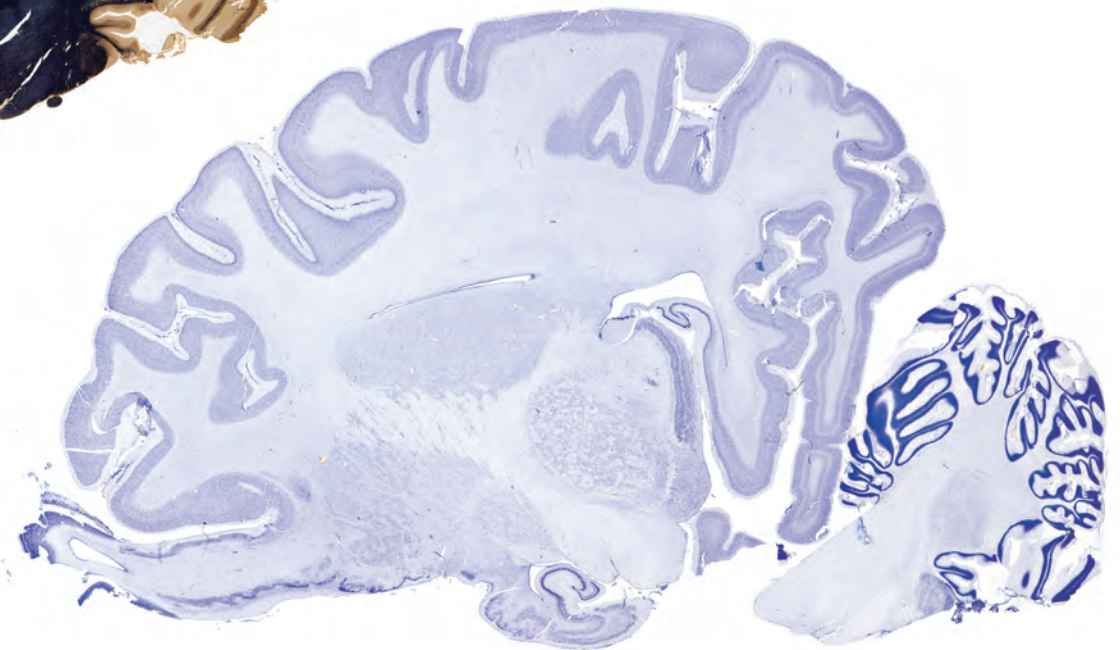
THE Neurotoxicity Testing Center



Grizzly Bear Brain in Sagittal Sections: Myelin and Nissl



A Grizzly bear (*Ursus arctos*) brain was embedded in MultiBrain™ Matrix, frozen and sectioned at 50 μ using NSA's hydraulically driven Lipshaw microtome. The section shown, mounted on a 3"x5" slide, was stained for myelin with the Weil iron hematoxylin method. A parallel set of sections was also stained for Nissl substance with thionine.



The brain was obtained through the efforts of Dr. George Stevenson of Jackson, WY, with the cooperation of the Montana Department of Game and Fish, US Dept of the Interior.



NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

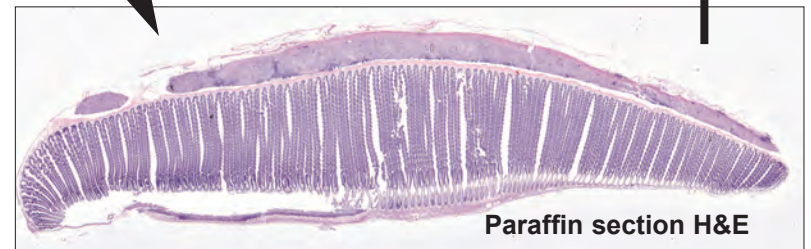
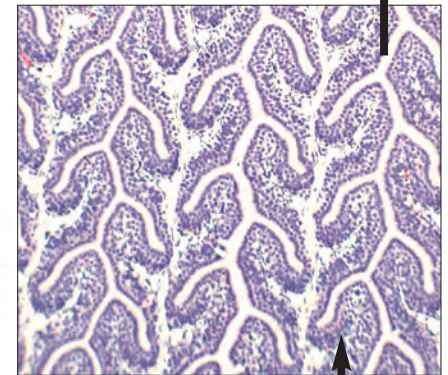
Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA



THE Neurotoxicity Testing Center



Hammerhead Shark--Sphyrna Lewini



The prominent olfactory sacs provide considerable size and enormous surface area of the olfactory epithelium supported on the olfactory rosettes shown to the right at successively in higher magnifications.

Further information on these amazing structures can be also be found at:
http://biomechanics.bio.uci.edu/_media/pdf_papers/j_morph_hammer.pdf.
From a project commissioned by Dr. Tim Tricas (tricas@hawaii.edu) of the Hawaiian Institute of Marine Biology

NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

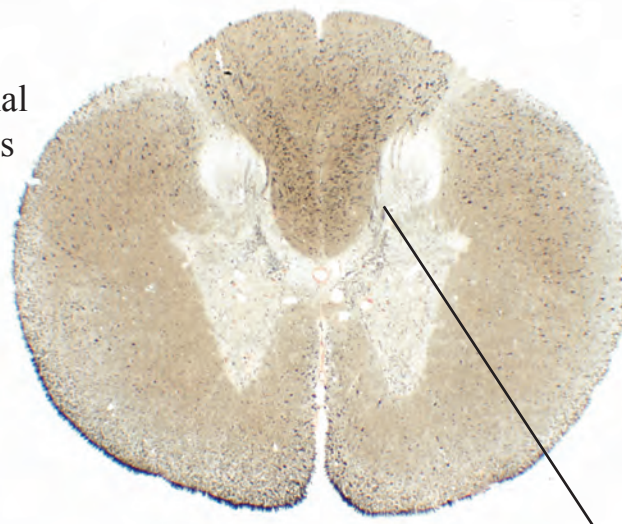
THE Neurotoxicity Testing Center



Monkey Spinal Cord in EAE* Model of Multiple Sclerosis



Coronal Views



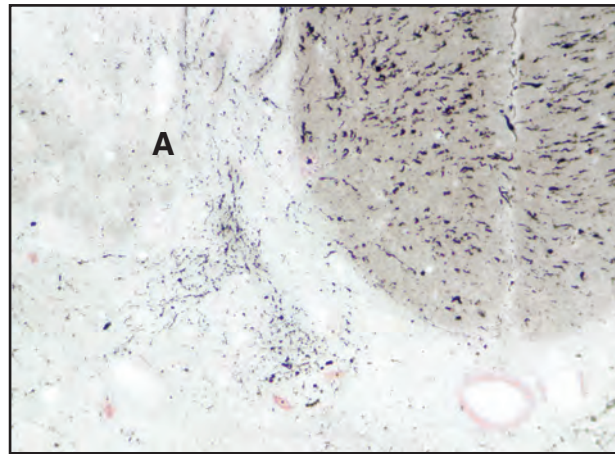
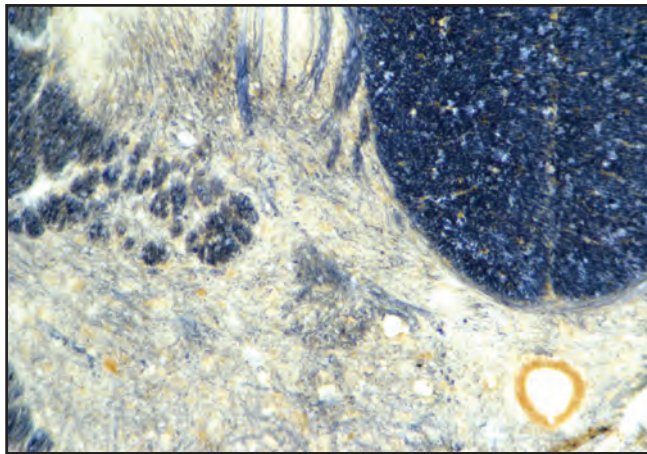
High signal to noise detection of disintegrating axons is obtained with the stain of deOlmos as compared to a traditional staining method for myelin.

This material suggests that axon degeneration may precede the loss of myelin.

*EAE= Experimental Autoimmune Encephalomyelitis

Myelin stain-Weil method

Degeneration stain-deOlmos method



Horizontal



NEUROSCIENCE ASSOCIATES, Inc.

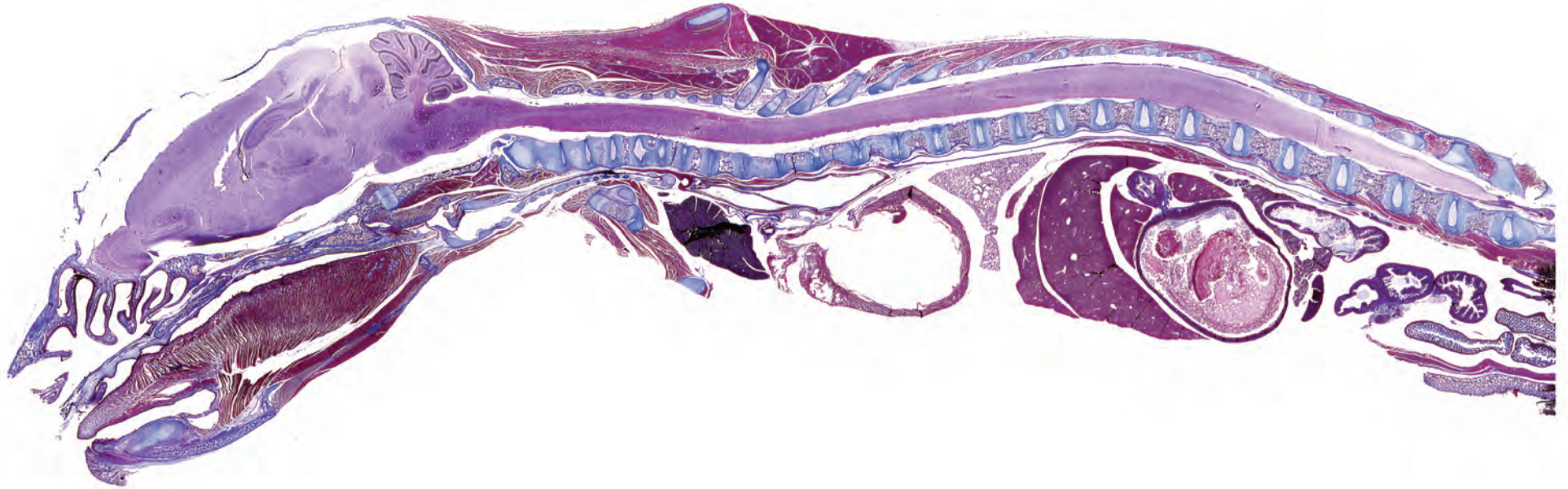
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
 www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center



Entire Rat Paraffin-Sectioned and Stained With Mallory Trichrome



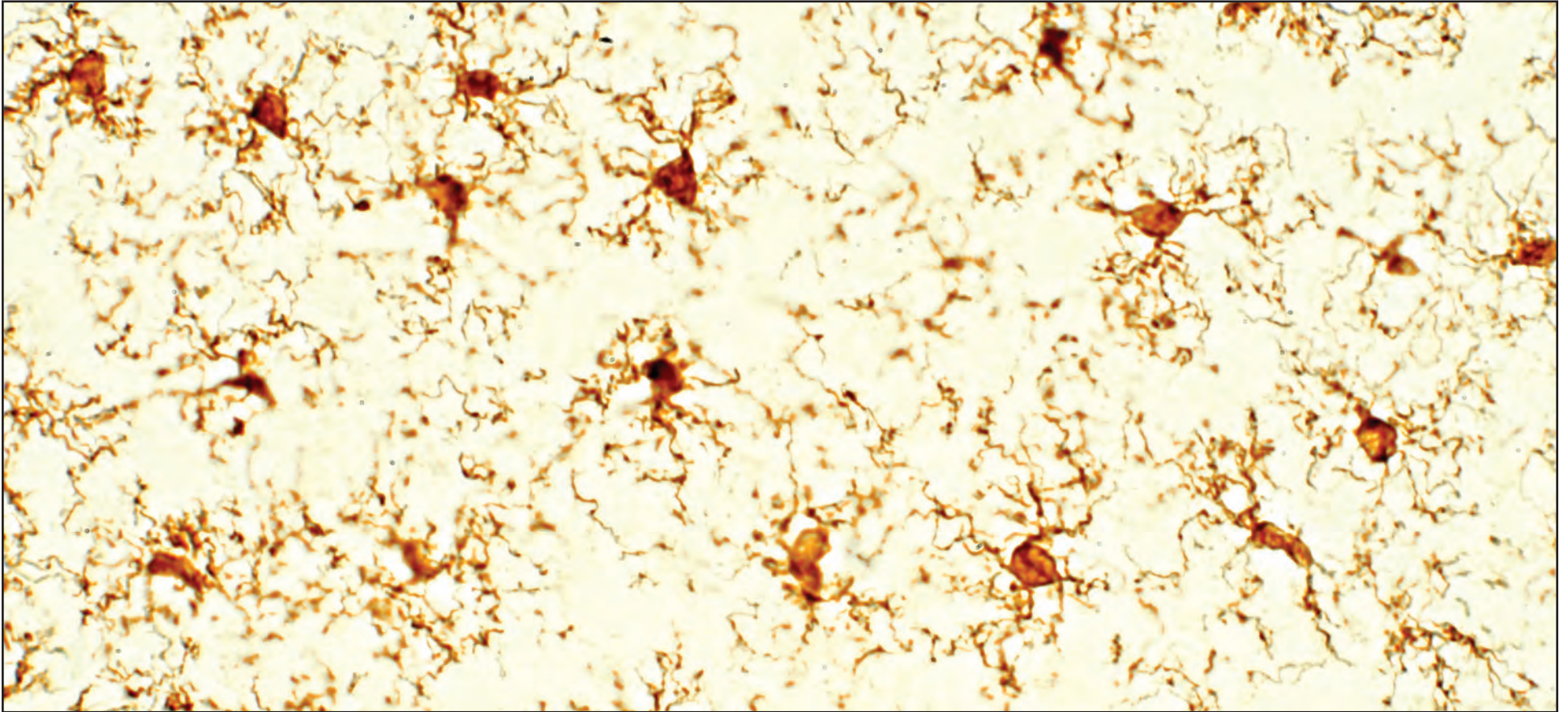
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center



Iba1 Immunohistochemistry Reveals Microglia



In 1996 Imai, et. al. (*Biophys. Biochem. Res. Commun.*, 224 (1996) 855-862) discovered a gene encoding the protein Iba1 (ionized calcium-binding adaptor molecule 1) that encoded a protein found in microglia and macrophages. Other markers for microglia have been species dependent, time-in-formaldehyde-sensitive, or difficult to utilize consistently. Antibodies against Iba1 reveal microglia in numerous species as shown here in an image of guinea pig cortex.



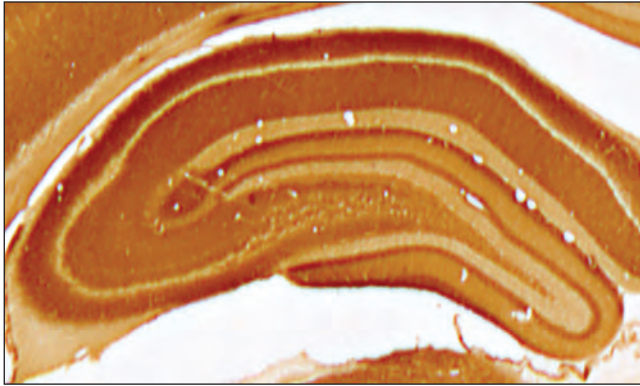
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center

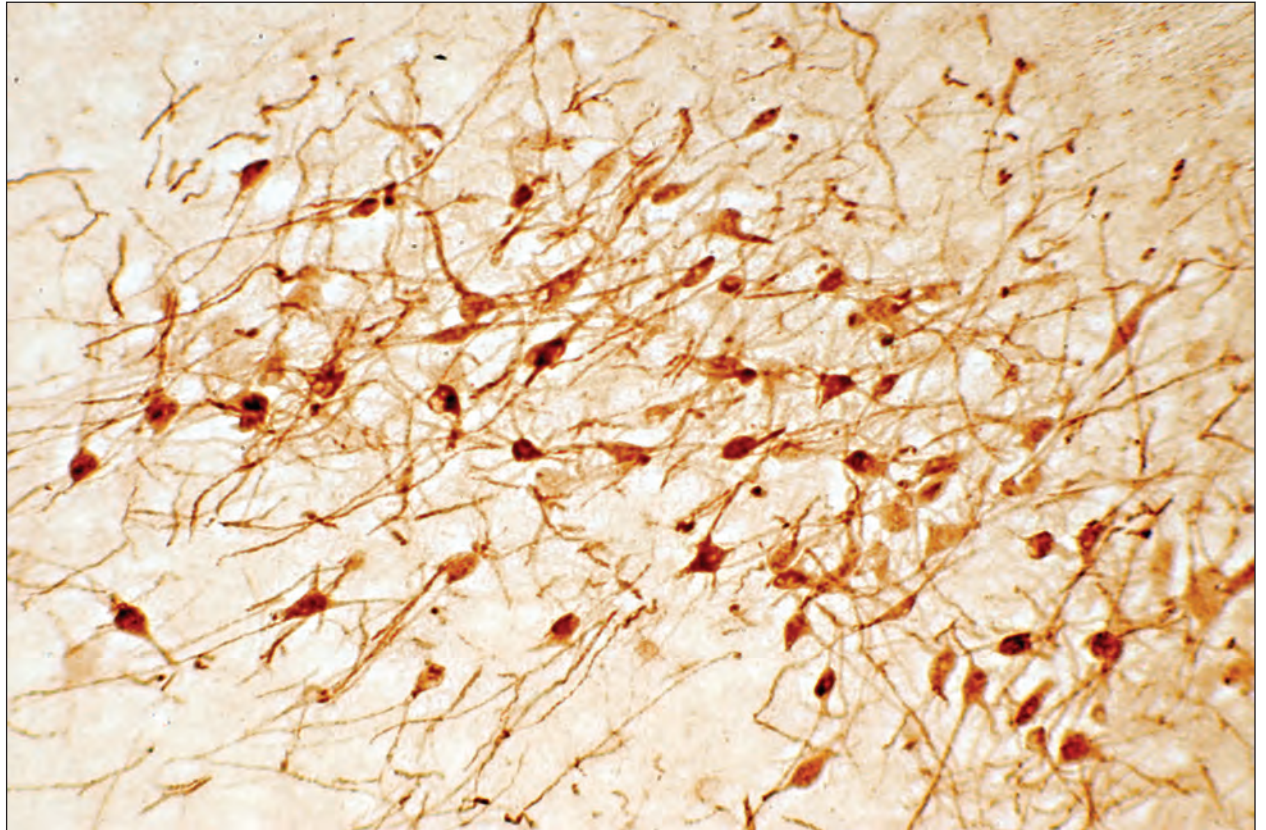


Alpha-synuclein Immunohistochemistry



Antibodies against synuclein have primarily been used for investigating abnormal aggregates in Parkinson's disease. The normal distribution of synuclein, however, presents an interesting dimension of normal chemoarchitectonics as shown in this image of rat hippocampus.

Calbindin Immunohistochemistry



Numerous cells in the brain are highly positive for calbindin, of which the purkinje cells are the most 'popular'. Shown in this image are calbindin positive neurons in the dorsal lateral septum of a rat.



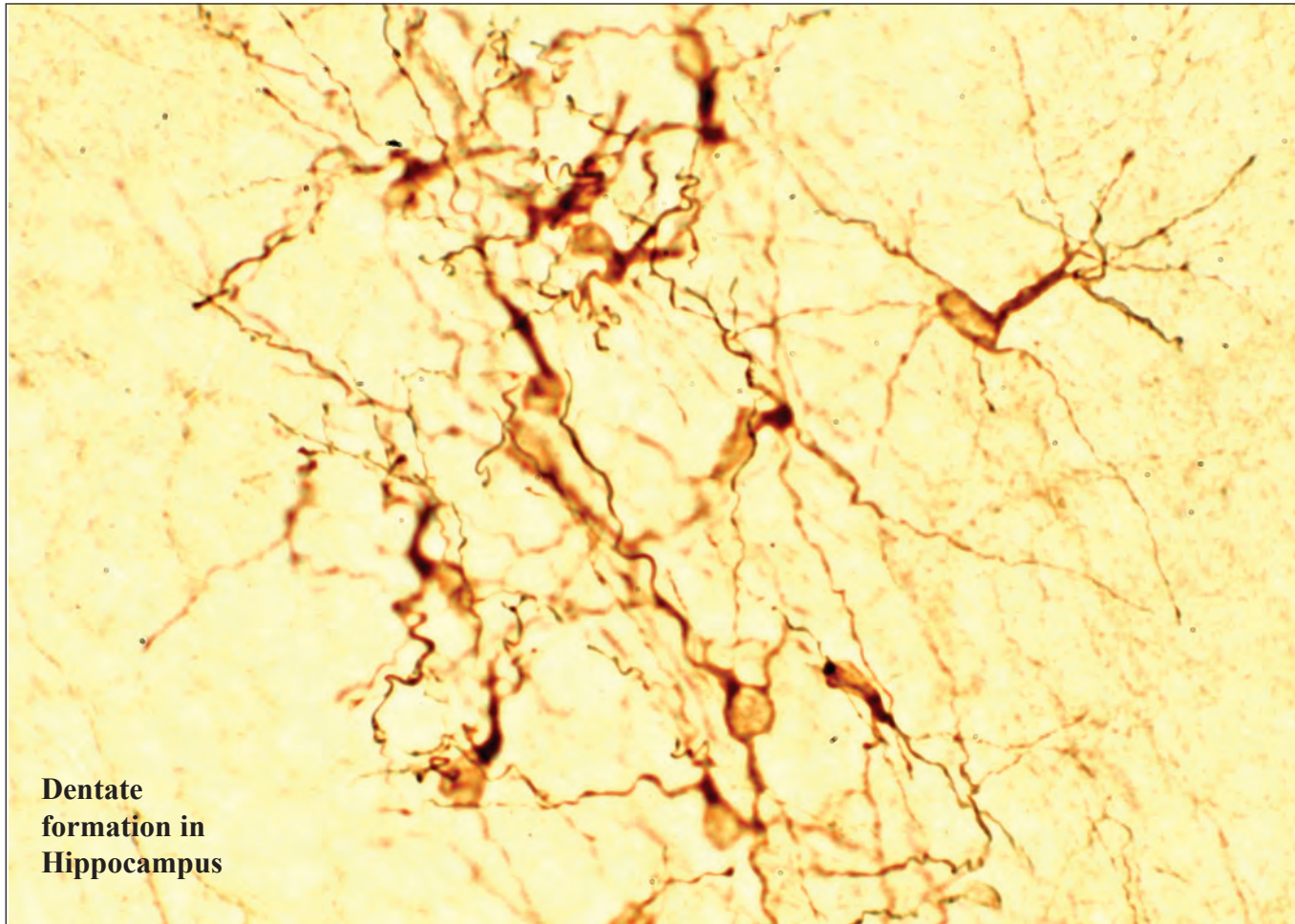
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center



DoubleCortin Immunohistochemistry Reveals Newly Formed Neurons (Microtubule Binding Protein)



Newly created neurons (recently divided) express cytoplasmic 'double cortin' (a microtubule-associated phosphoprotein) for several days after which time they express 'adult' like markers such as NeuN. (see e.g. Rao and Shetty, *Eur. J. Neurosci.* 19: 234-246, 2004)



NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

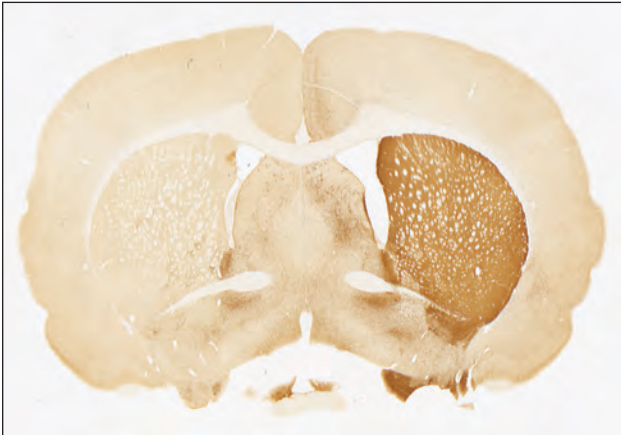
THE Neurotoxicity Testing Center



Stem Cell Function Efficacy Assessments: Parkinson's Disease Model

The desired function of cells created from stem cells can be probed using techniques specific to that particular function. The example below is specific to an approach relevant to Parkinson's disease therapy. Other probes or stains can be used to assess each unique application of stem cell therapy. Brains inflicted with Parkinson's disease experience a loss of dopamine-producing cells that produce Tyrosine Hydroxylase (TH).

PD Model Brain



In this disease model animal, TH presence has been successfully suppressed in the left hemisphere. Suppression such as this is consistent with human Parkinson's cases.

Normal Brain

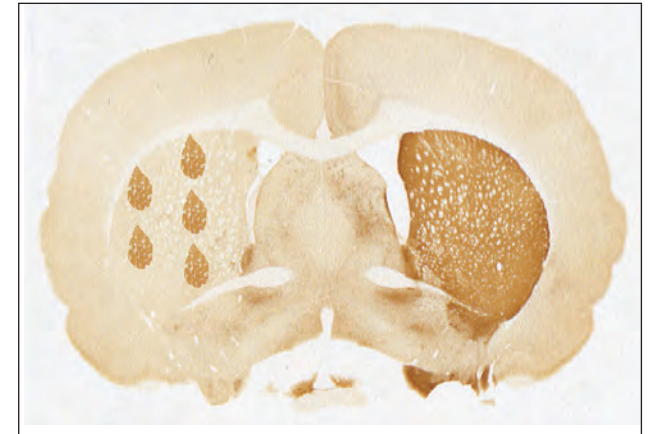


This example shows the balanced presence of TH in a "normal" area as indicated by the dark brown stained area.

Stem cell treatments related to Parkinson's disease often involve the attempt to create dopamine-producing stem cells that will spawn the increased production of TH when introduced into the brain.

Immunohistochemistry that reveals the presence of TH is one indicator of success in this type of therapy.

Treated PD Model Brain



This section simulates the appearance of a successful attempt to resume TH presence in zones near points injected with stem cells. The dark teardrop shapes in the left hemisphere indicate resumption of generation of TH in areas injected with stem cells.



NEUROSCIENCE ASSOCIATES, Inc.

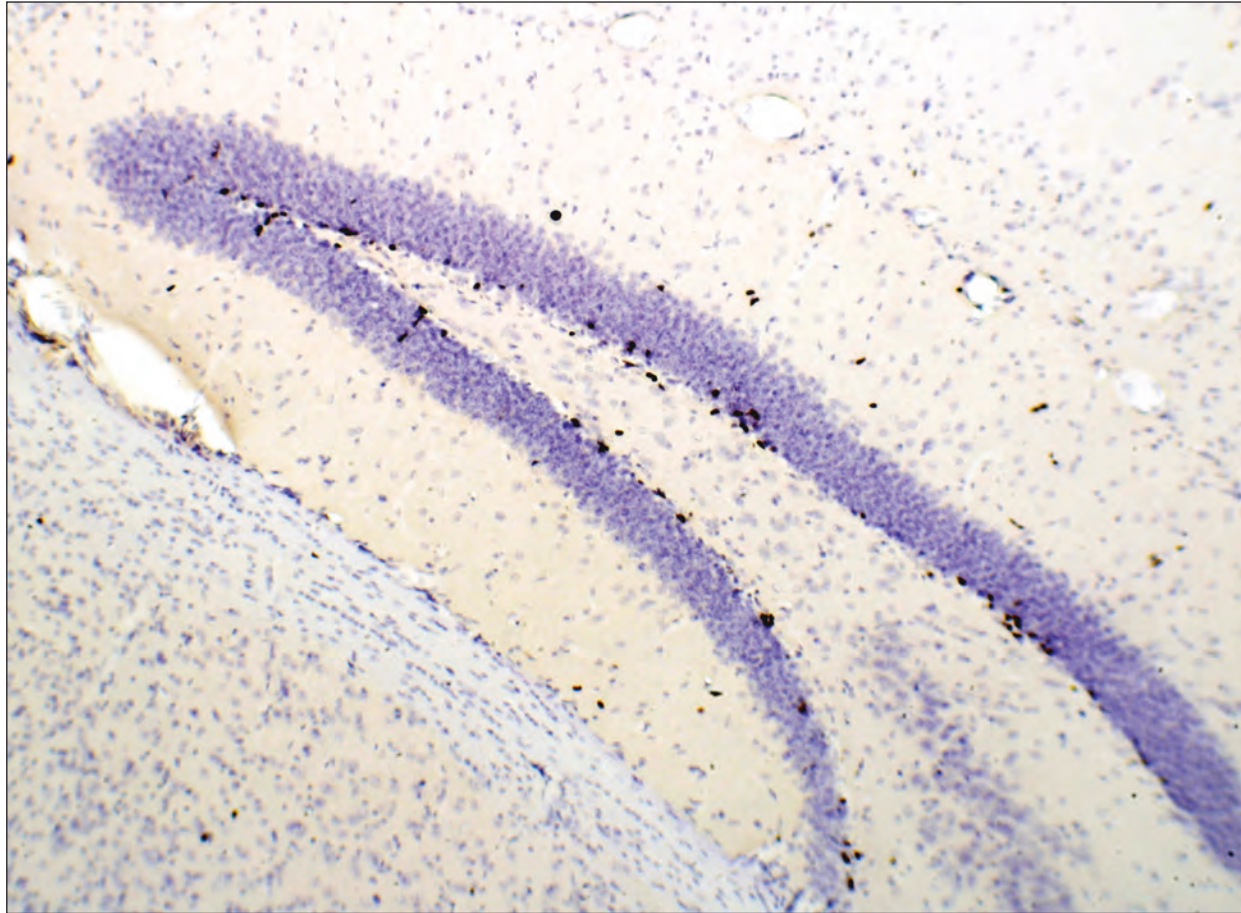
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center



BrdU Immunohistochemistry



To identify newly created neurons, an animal is injected with BrdU (bromodeoxyuridine) which will be incorporated into newly synthesized DNA (masquerading as thymidine) thereby marking the cell's 'birthday'. In this image of a mouse's dentate formation of hippocampus, BrdU-labeled cells are seen as darkly-stained dots, mostly along the inner edge of the "arrowhead" of the dentate formation shown in this image. The purple staining is normal cell body background stained for anatomical reference.



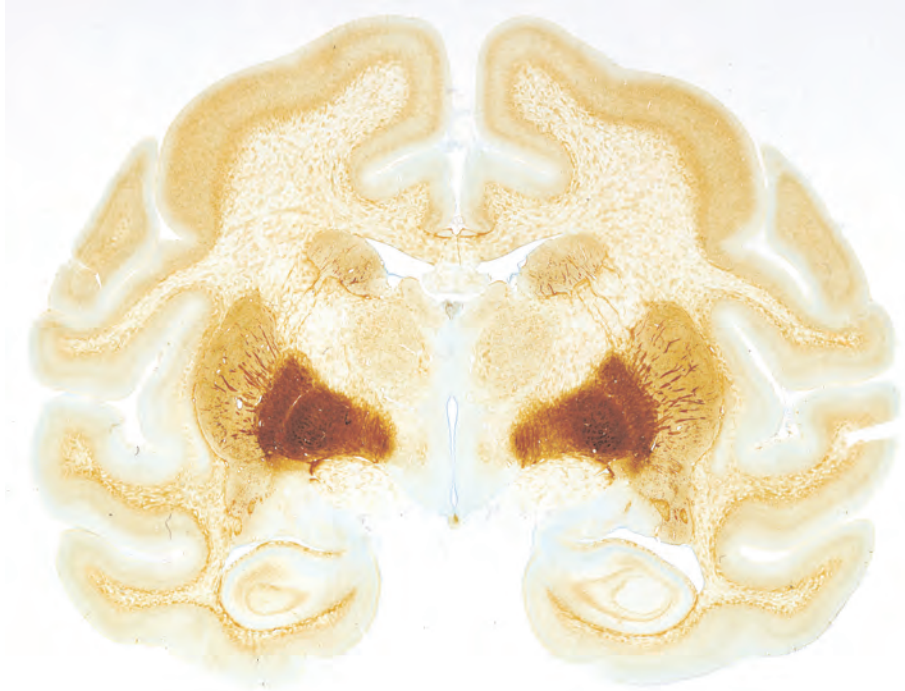
NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center

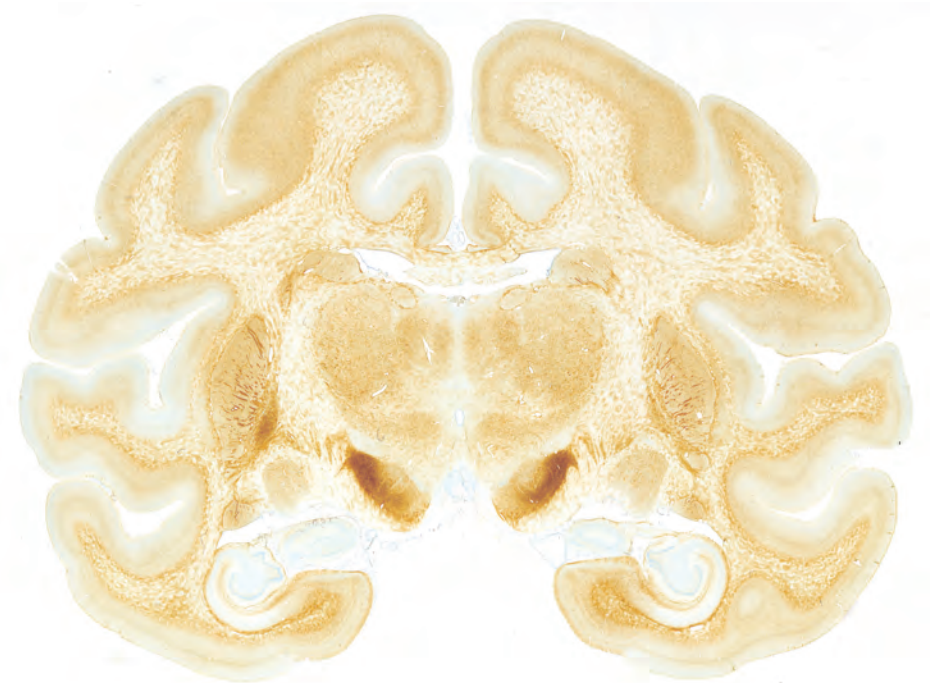


Ferric Iron-Rich Areas in African Green Monkey Brain



High concentrations of ferric iron are shown in the globus pallidus of the section to the left and in the substantia nigra, reticulata in the section below. Note the band of heavier iron staining in layer 6 of the cortex which can be seen in T2 weighted MRI images in the human brain. Also note the patchiness of iron staining in the white matter. The iron is predominately located in glia.

Ferric iron was revealed with the Perls reaction (acidified potassium ferrocyanide) intensified with diaminobenzidine. Blue color is a light counterstain for cell body nissl substance.



African green monkey, *Cercopithecus chlorocephalus*
(previously *C. sabaues*)
Brain specimen provided courtesy of
Dr. Eugene Redmond, Yale University and RxGen.



NEUROSCIENCE ASSOCIATES, Inc.
Premier Neurohistology Services and Specialized Tools

Sales 866-341-8191 or 540-341-8191 Lab 800-972-3401 or 865-675-2245 Fax 865-675-2787
www.NSALabs.com Info@NSALabs.com 10915 Lake Ridge Drive Knoxville, TN 37934 USA

THE Neurotoxicity Testing Center

