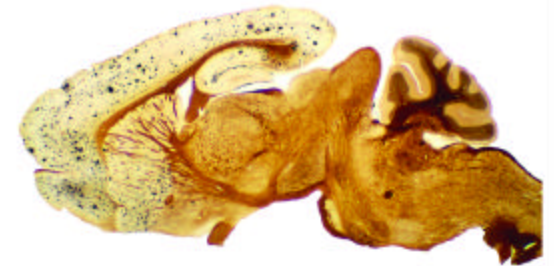
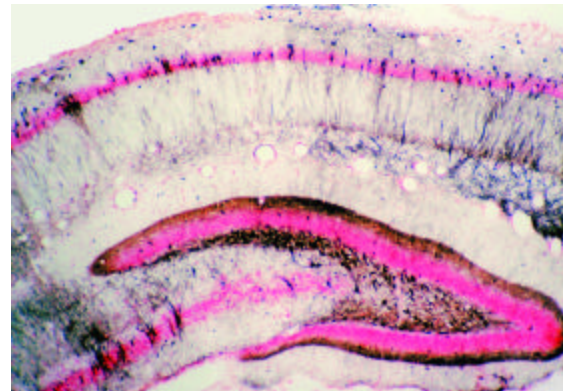
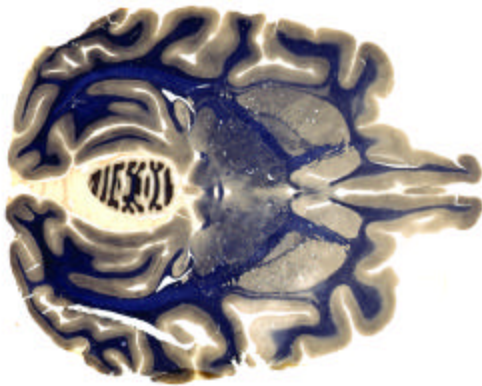
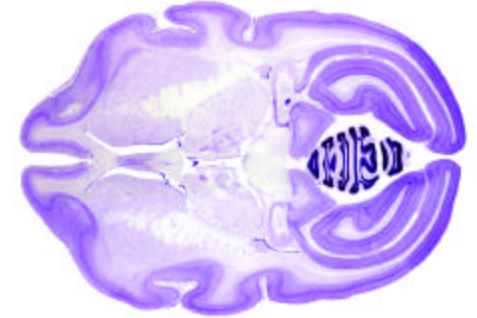
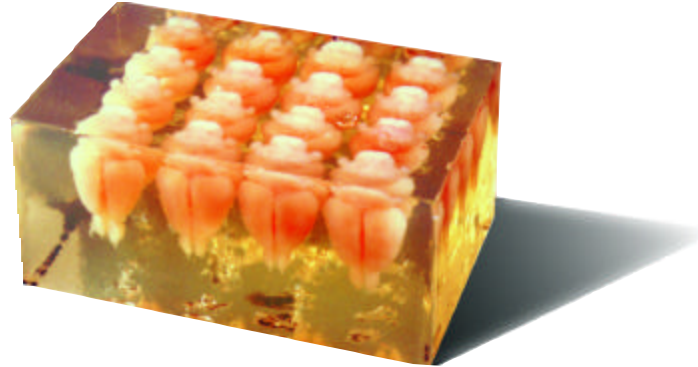




2005 Calendar



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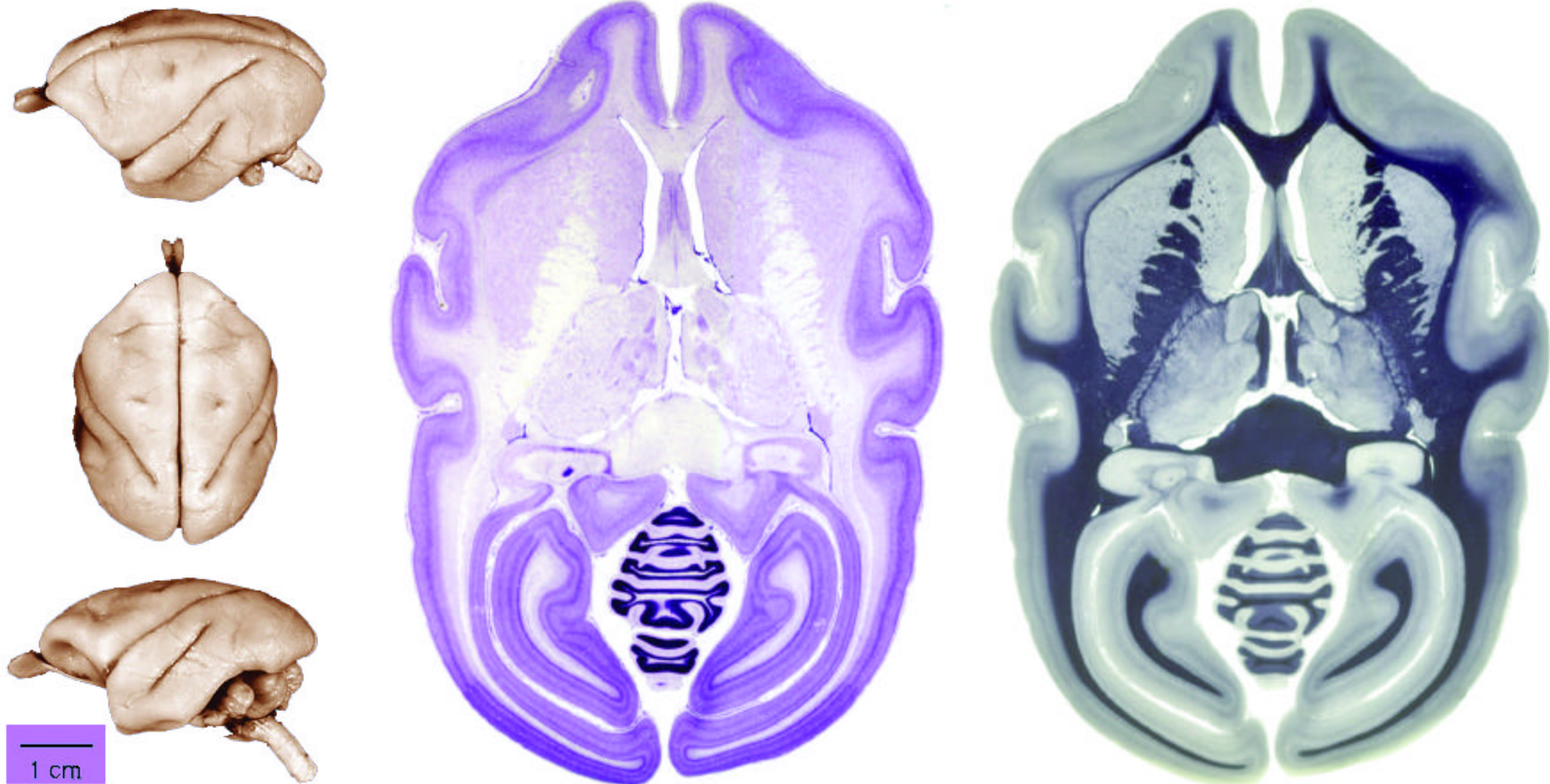
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Owl Monkey Brain: Nissl and Myelin Sections



Images of different views of the intact brain of an Owl monkey (*Aotus trivirgatus*) complement the two horizontal sections from this brain. The bluish purple section was stained for Nissl substance (RNA/DNA) in cell bodies. The grayish section shows myelin, the wrapping around axons. The brain images are reproduced with permission by Carol Dizack at <http://www.brainmuseum.org>, supported by the US National Science Foundation Division of Integrative Biology and Neuroscience.



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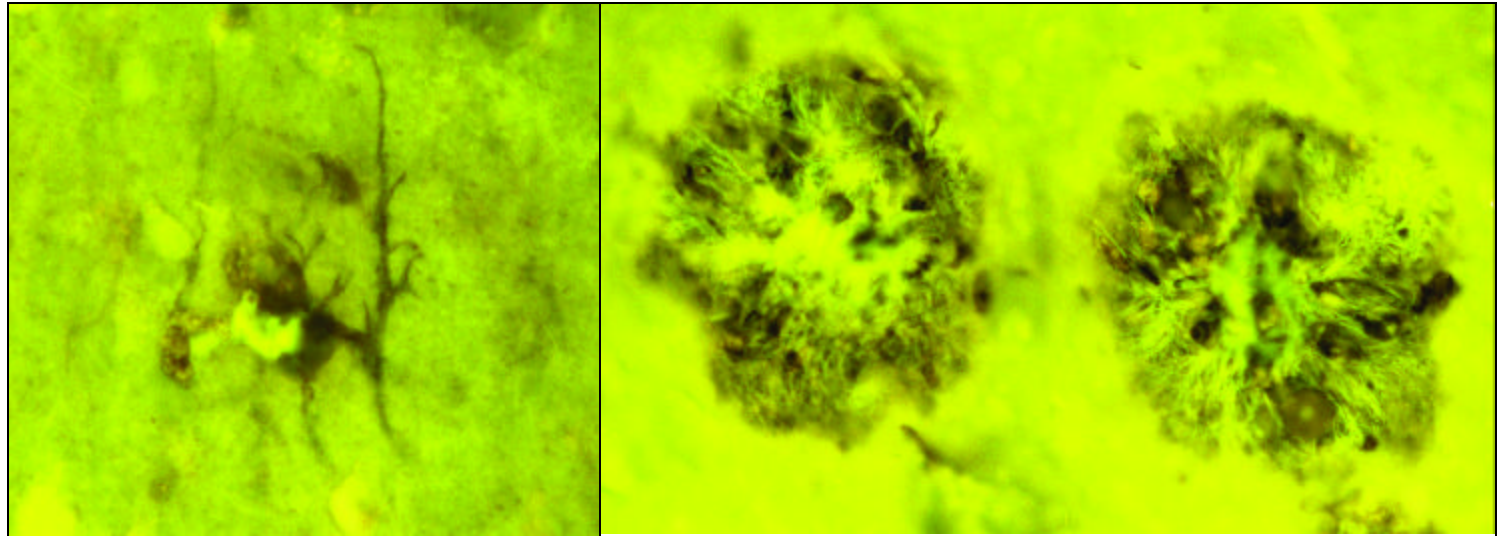
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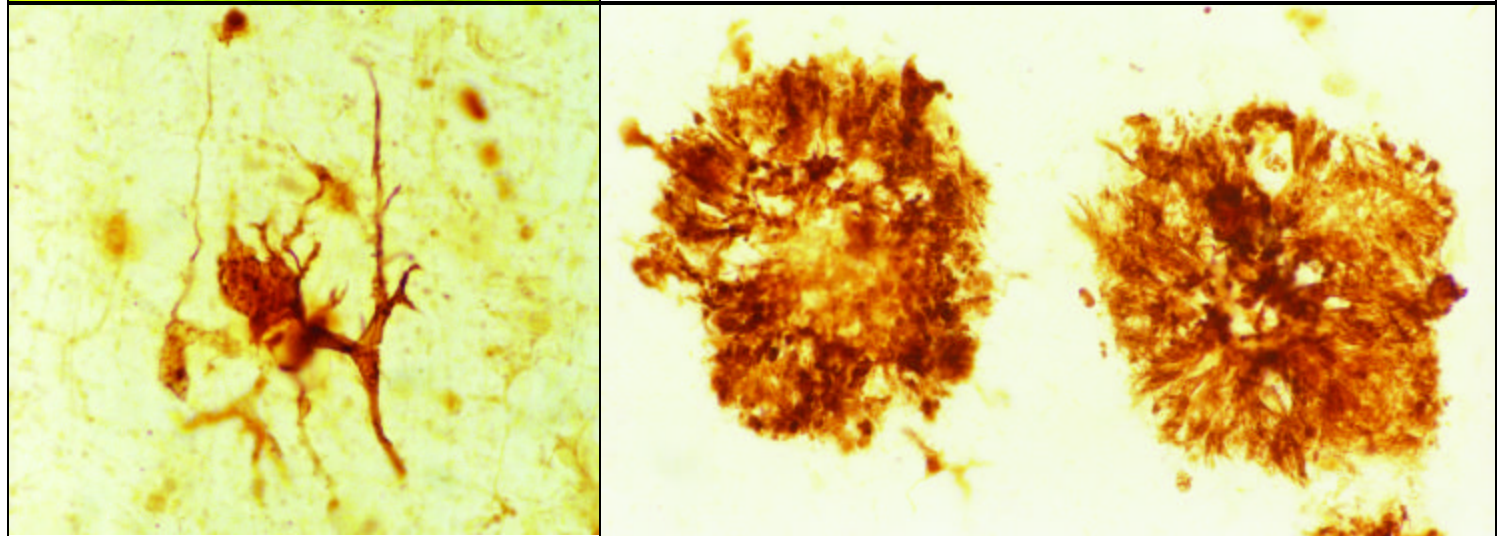


Thioflavine-S stained amyloid in Iron-positive glia and plaques in a case of Alzheimer's disease

Staining of fibrillar amyloid is revealed by the fluorescent dye, thioflavine-S, seen as brilliant yellow in the top panels of a glial cell (left) and two neuritic plaques (right).



Ferric iron is revealed in the same glia and plaques using the Perls reaction and then enhanced with diaminobenzidine. Not all cases of Alzheimer's disease exhibit such intense iron staining.



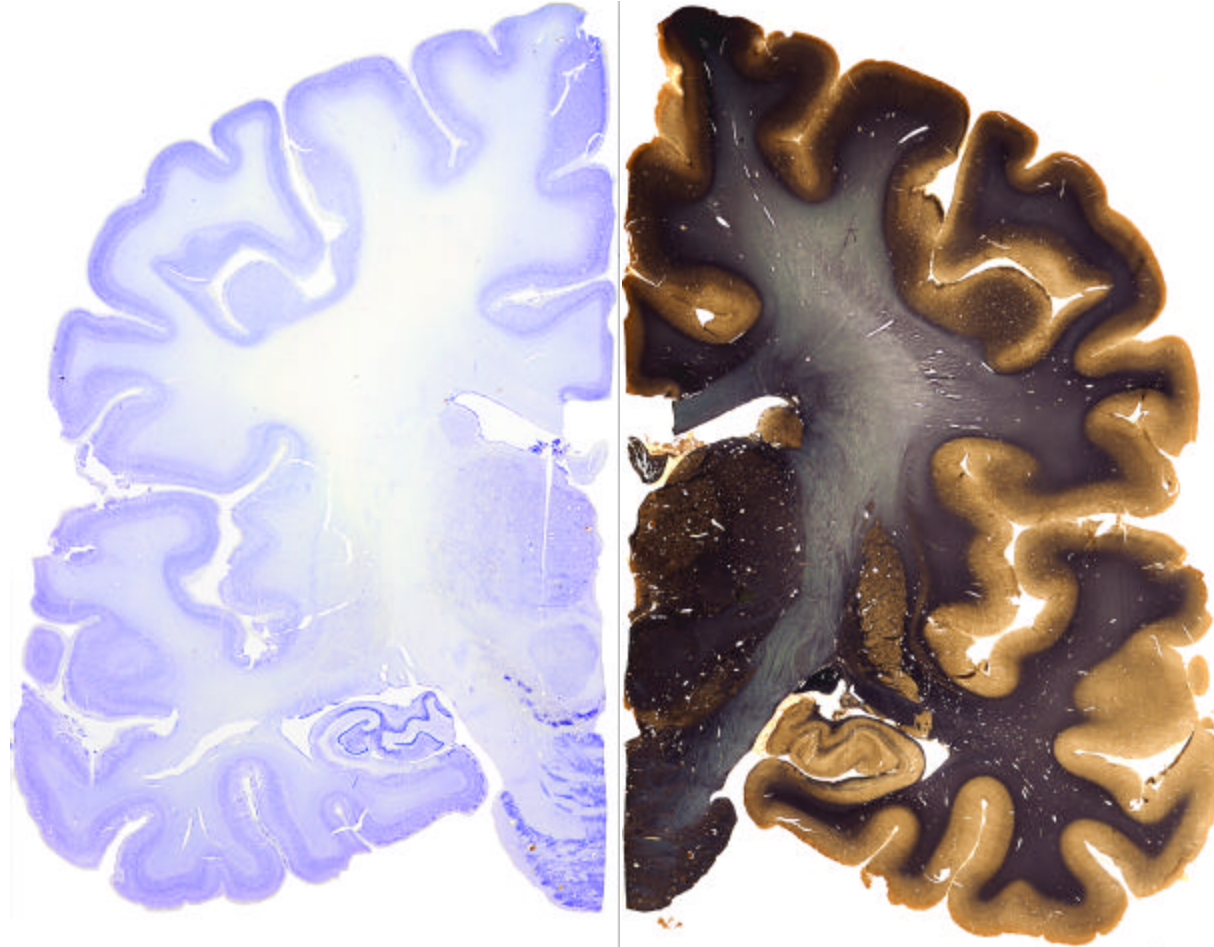
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Human Brain Hemisphere Sections



Adjacent sections stained for the Nissl substance in cell bodies (blue) and for myelin (black). The image for myelin was reversed to allow the midlines to match. The hemisphere was sectioned using a specially adapted hydraulically driven microtome. Sections were prepared for Eric Courchesne, University of California San Diego.



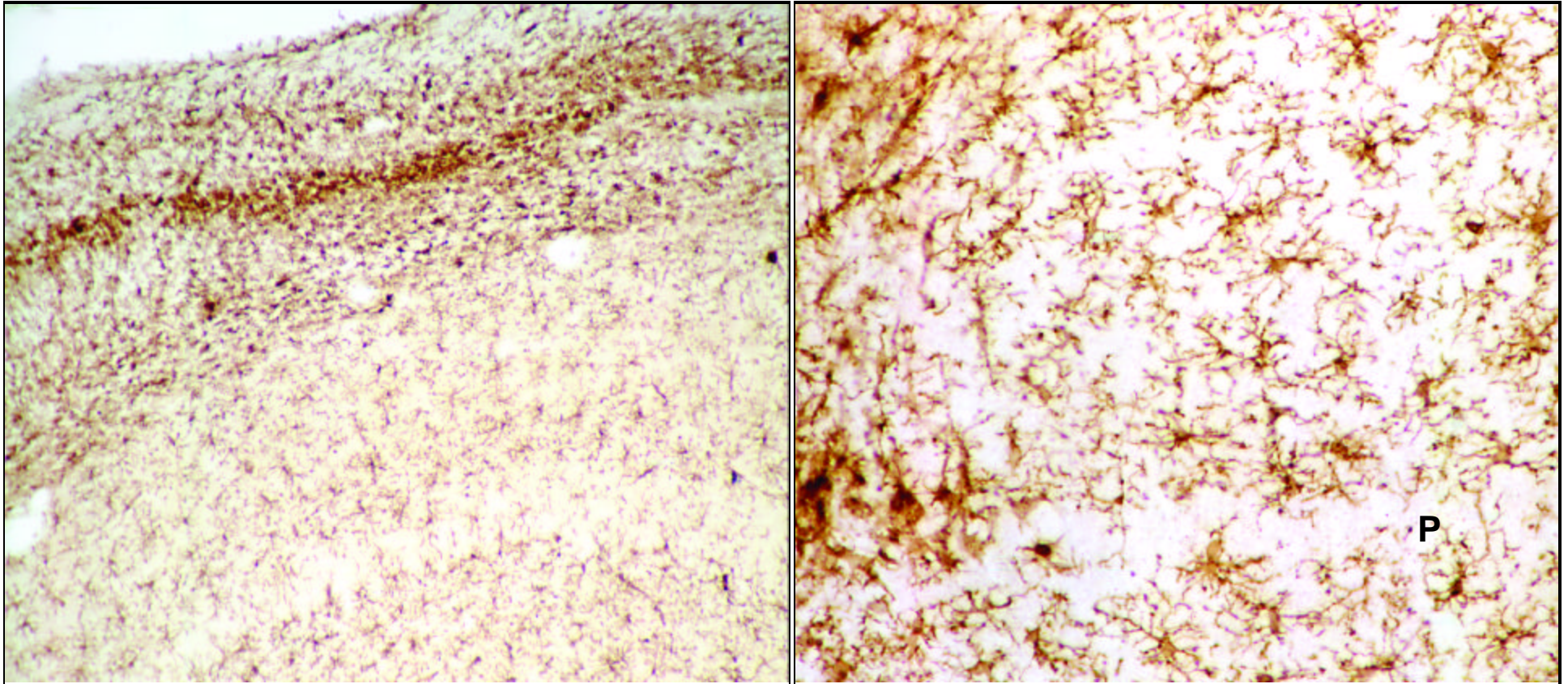
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Glut-5 Antibody Staining for Microglia



Microglia become reactive following traumatic brain injury. In their resting state microglia have numerous fine processes with multiple branches as shown in the bottom area of the left panel and in the right two thirds of the right panel. In response to trauma, the processes become shortened until there are none in the amoeba-form stage-see the dense band above

The area shown above left is hippocampus which was damaged following a contusion to the overlying cortex. The image in right panel is a higher magnification of the hippocampus in an area adjacent to the left panel. 'P' indicates the band of pyramidal cells of hippocampus. Microglia in the amoeba-form stage are to the far left.



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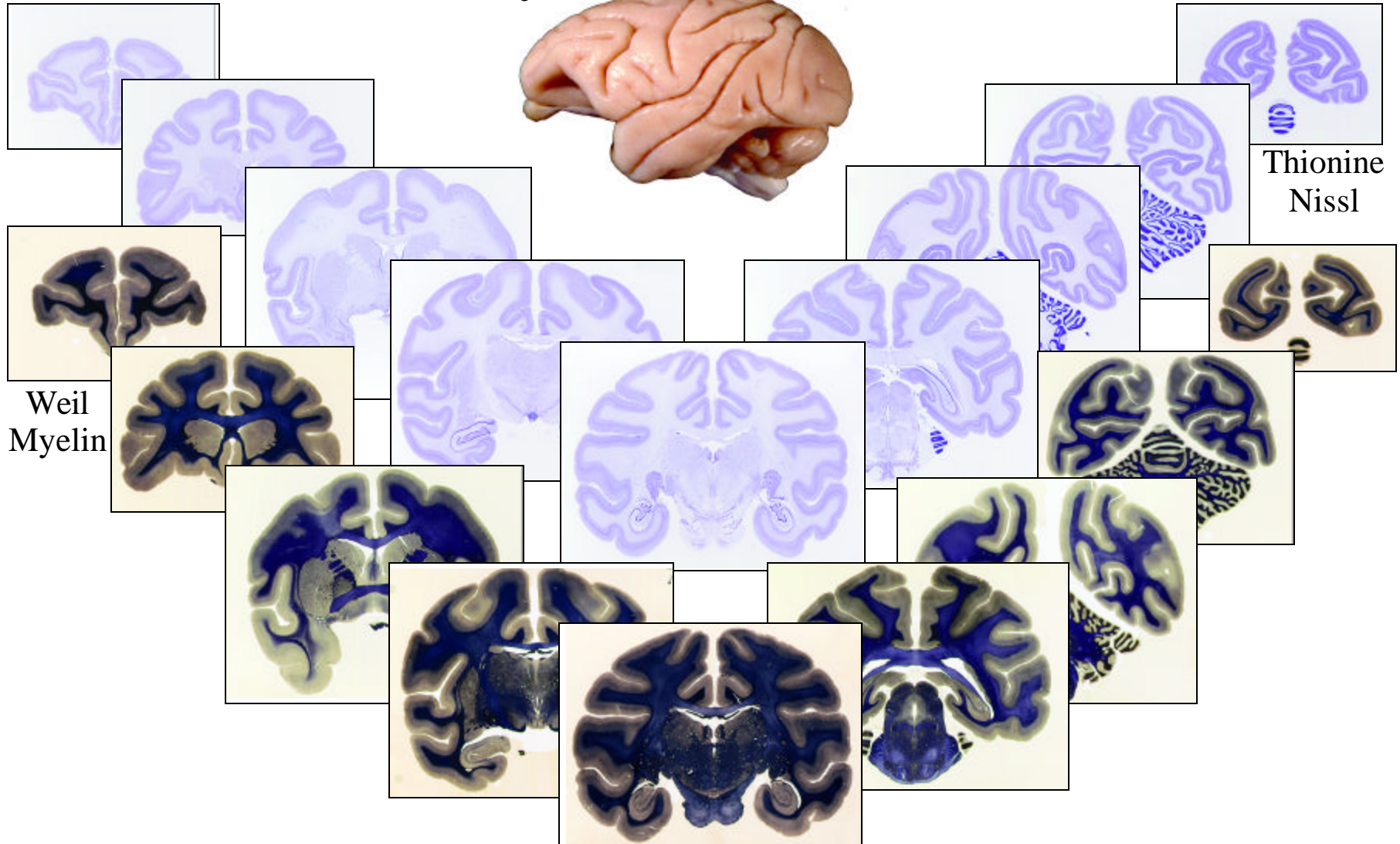
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Rhesus Monkey

Atlas Series



Thionine
Nissl

Weil
Myelin



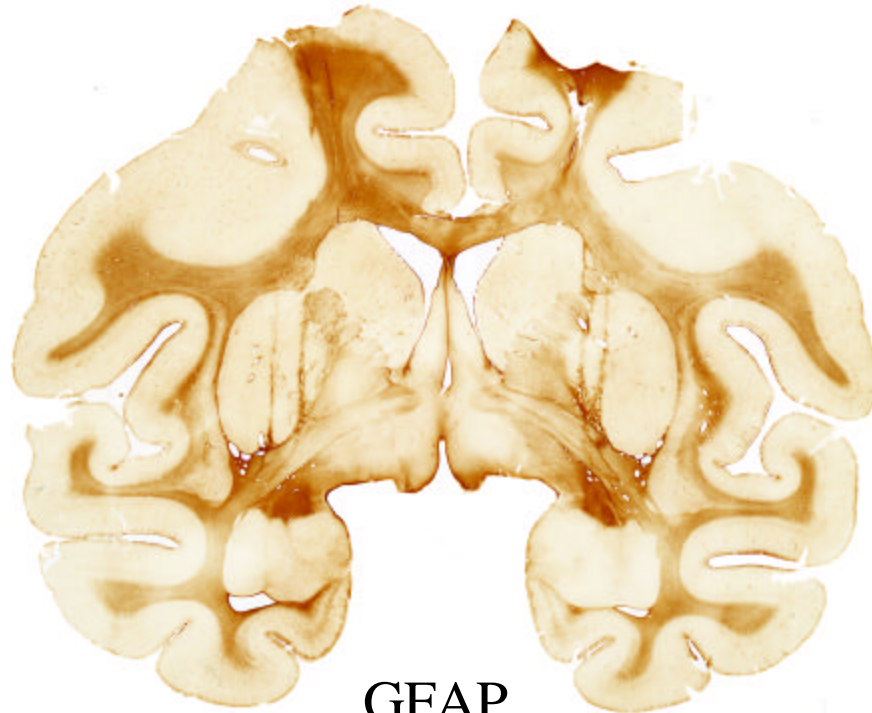
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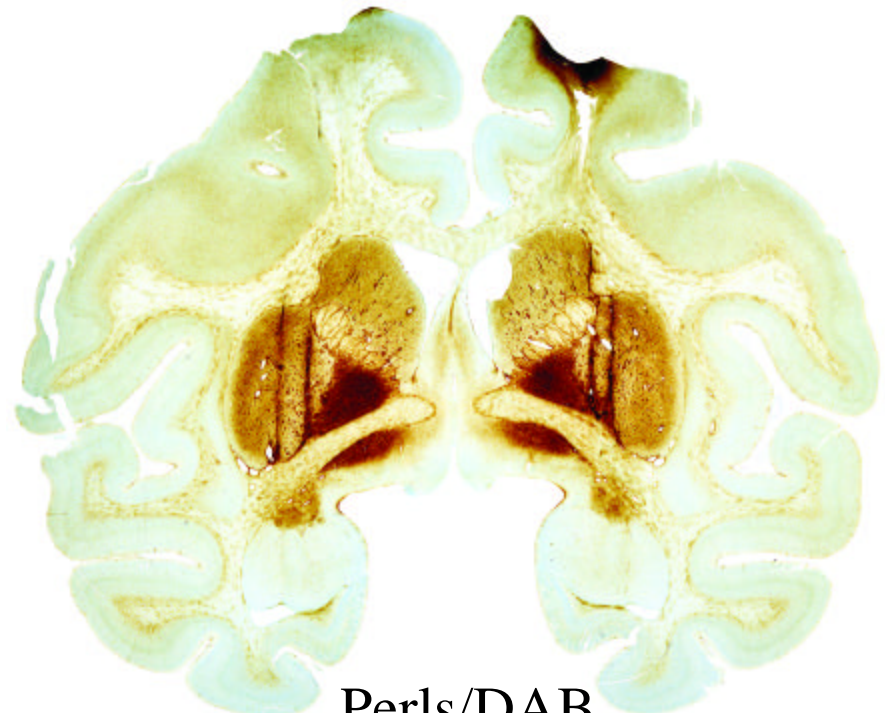
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Special Stains to Reveal Evidence of Needle Tracts



GFAP
(astrocytes)



Perls/DAB
(ferric iron)

Injection needles were inserted one year before sacrifice in a rhesus monkey to place lesions in parts of the amygdala. Histologic staining of adjacent brain sections for reactive astrocytes and for ferric iron reveal four of the needle tracts in parallel. The passage of the needles caused breakage of fine capillaries en route to their target. Red blood cells entered the brain parenchyma, ruptured and released the ferrous iron of the hemoglobin molecules. The iron became reduced to the ferric state and could be visualized using the histochemical Perls method to produce the Prussian blue reaction product. This reaction product was intensified using hydrogen peroxide and diaminobenzidine to yield a reddish brown deposit. Astrocytes reacting to the damage of the tracts were revealed immunohistochemically using an antibody against the astrocyte specific protein, GFAP. Sections courtesy of Steve Shelton, University of Wisconsin. Results of study reported in *J Neuroscience* (2004) 24:5506–5515.



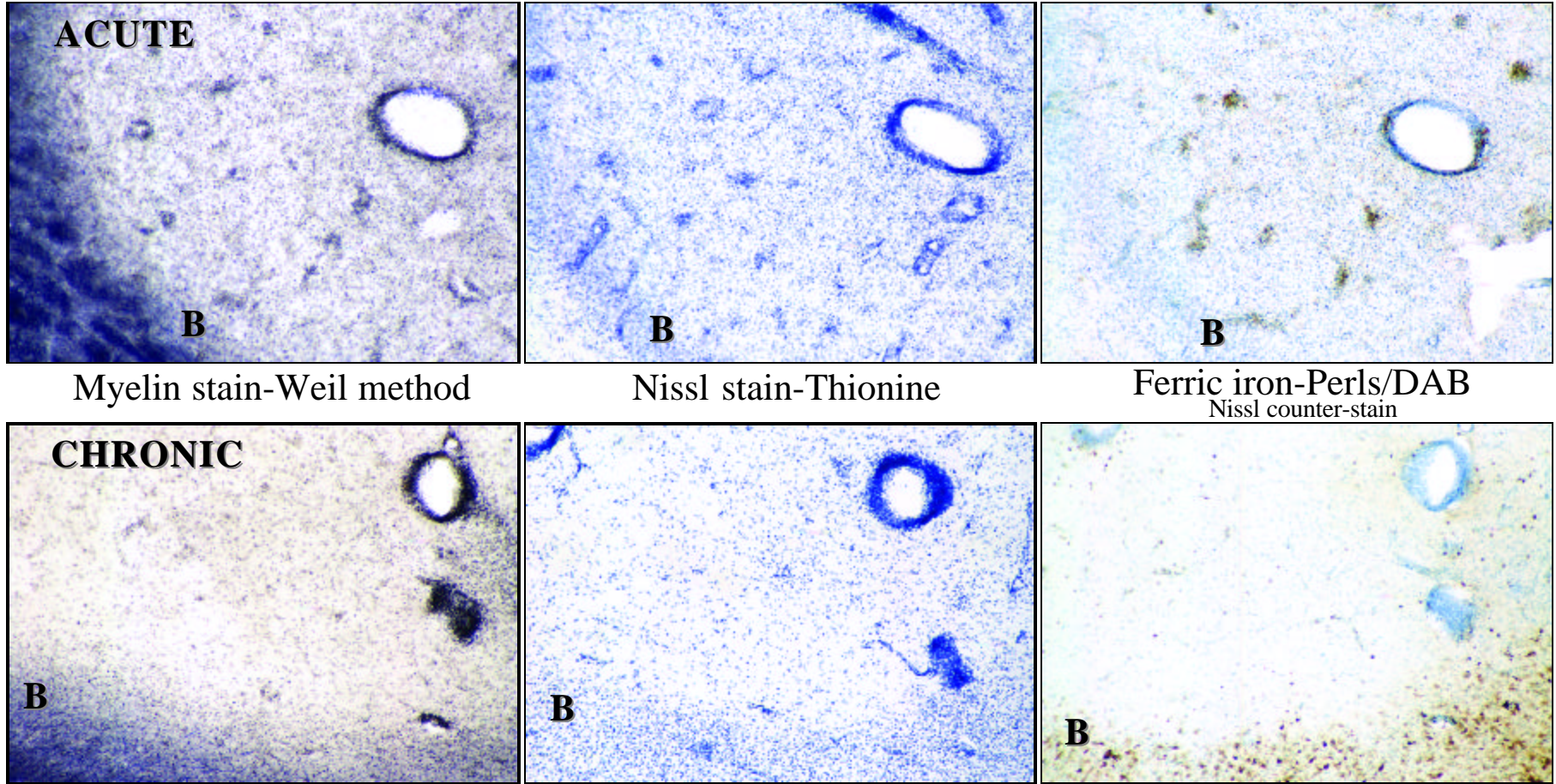
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Multiple Sclerosis: Acute & Chronic Lesions-Differential Staining



Near adjacent sections from the same case of Multiple Sclerosis were stained for different features to allow comparisons of recently developed lesions (acute) versus long standing lesions (chronic). The hallmark lesion of MS is the loss of myelin seen to the left and high cellularity around vessels (cuffing) seen in each of the photos. This cellularity around small vessels in the acute series is absent in the chronic. Iron positivity corresponds to small vessel cellularity in the center of the lesion of the acute and in the boundary (B) zones where reactive glia are present.



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Squid Embryo/Hatchling- *Loligo pealei*



Squid Embryo/Hatchling-(see Arnold, 1965 Normal embryonic stages of the squid *Loligo pealei*, Biol. Bul. 128:24-32) from MBL, Woods Hole, MA
Paraffin section (6 μ) stained with hematoxylin & eosin (H&E)- Sections prepared for Phil Grant, NINDS-NIH



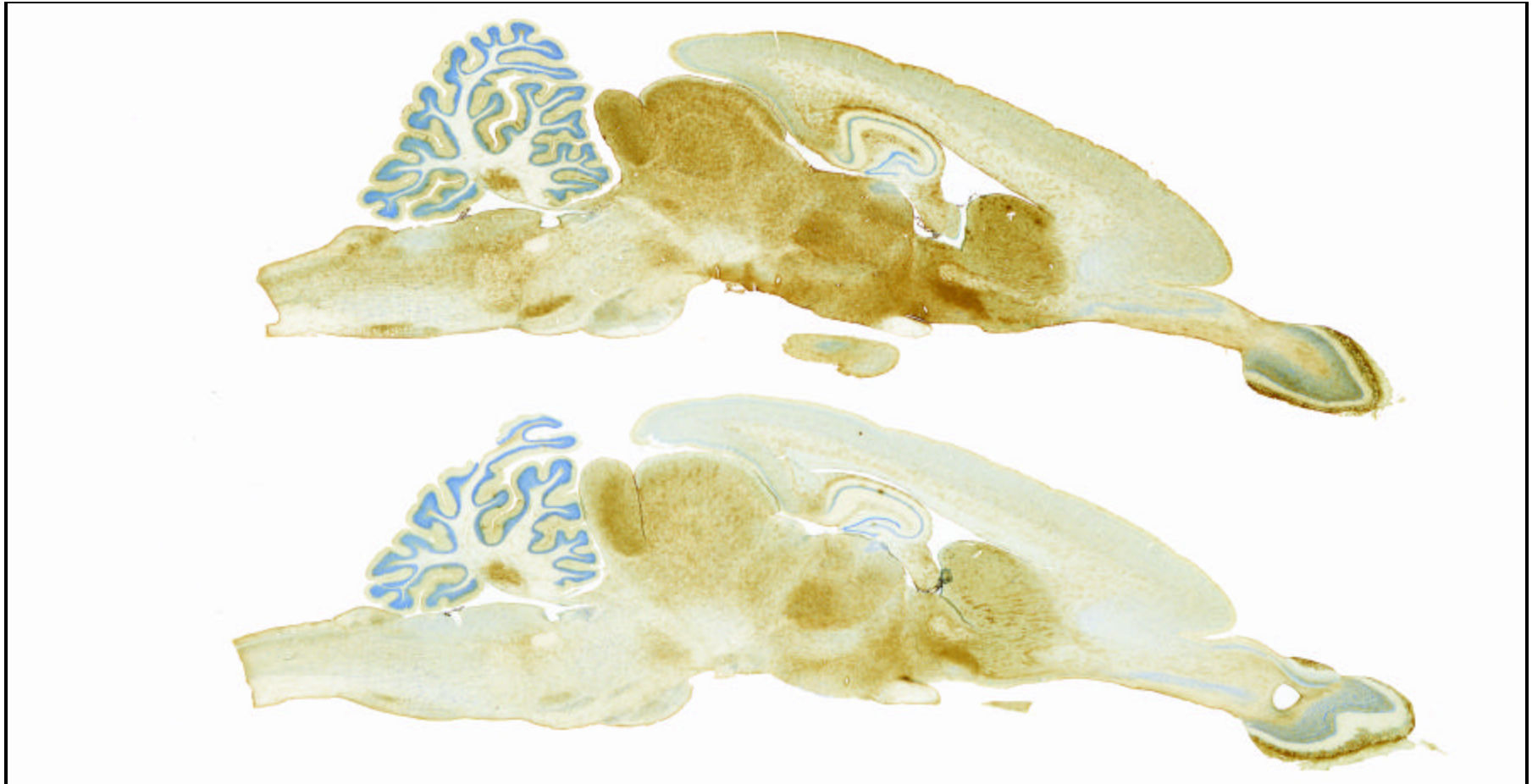
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Ferric Iron Distribution in Rabbit Brain




The distribution of ferric iron in these sagittal sections of two rabbit brains is revealed by staining the sections with the Perls method (HCl & K ferrocyanide) and enhancing that blue reaction product with hydrogen peroxide and diaminobenzidine which yields the reddish-brown staining shown here. The section was counter-stained with thionine (blue) to show the location of cell bodies.



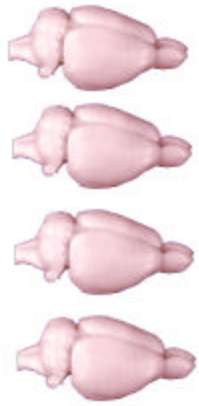
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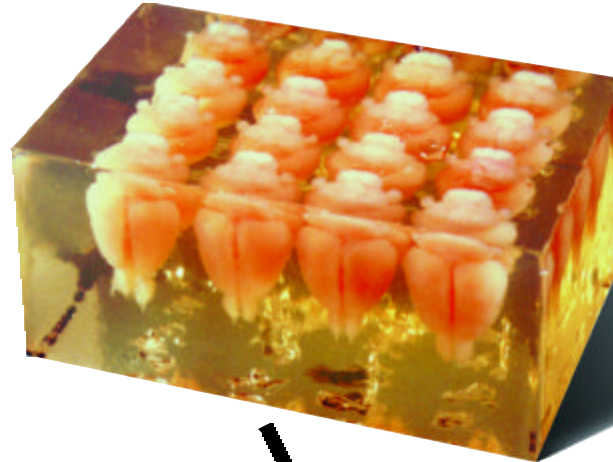


MultiBrain™ Technology Process

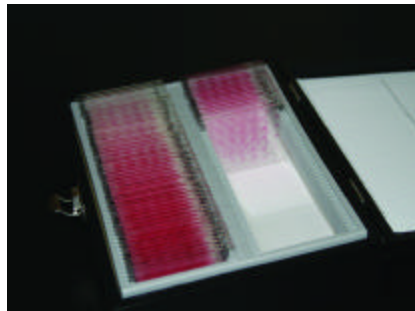
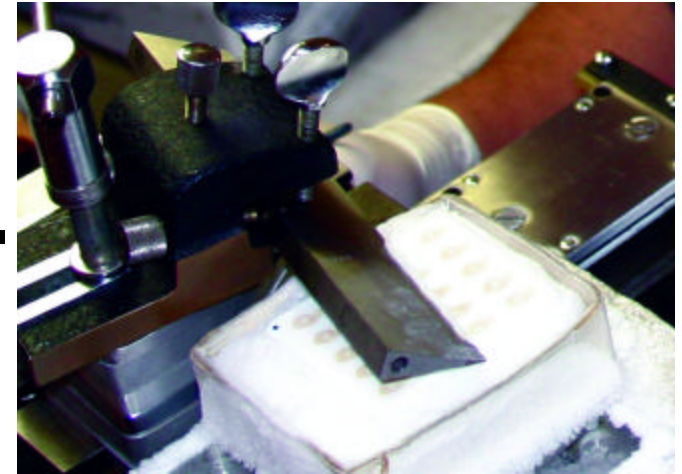


Up to
16 rat brains
or
25 mouse
brains

Embedding



Sectioning



Finished Slides



Resource of Sections



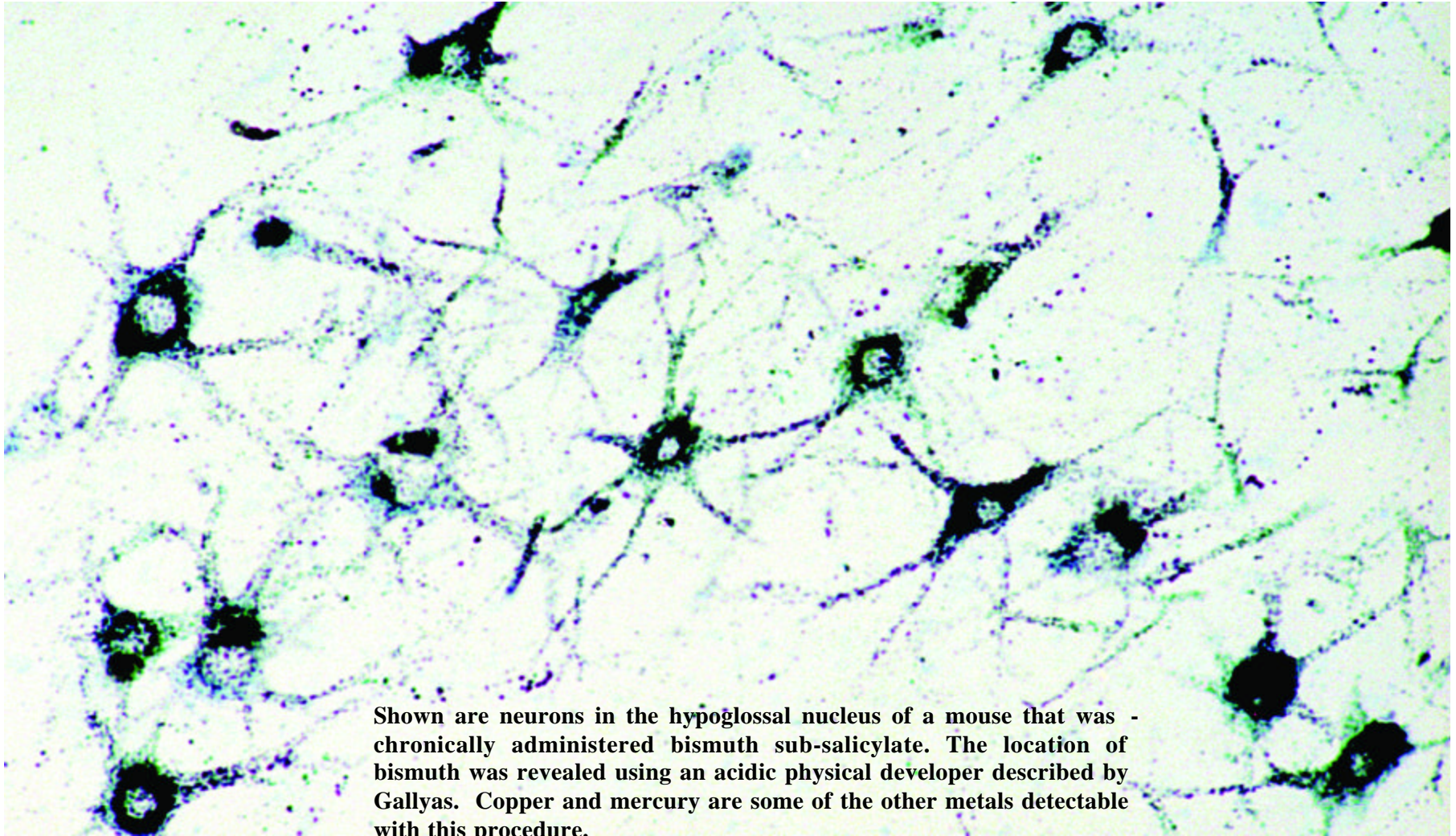
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Autometallography Detection of Metals



Shown are neurons in the hypoglossal nucleus of a mouse that was -
chronically administered bismuth sub-salicylate. The location of
bismuth was revealed using an acidic physical developer described by
Gallyas. Copper and mercury are some of the other metals detectable
with this procedure.



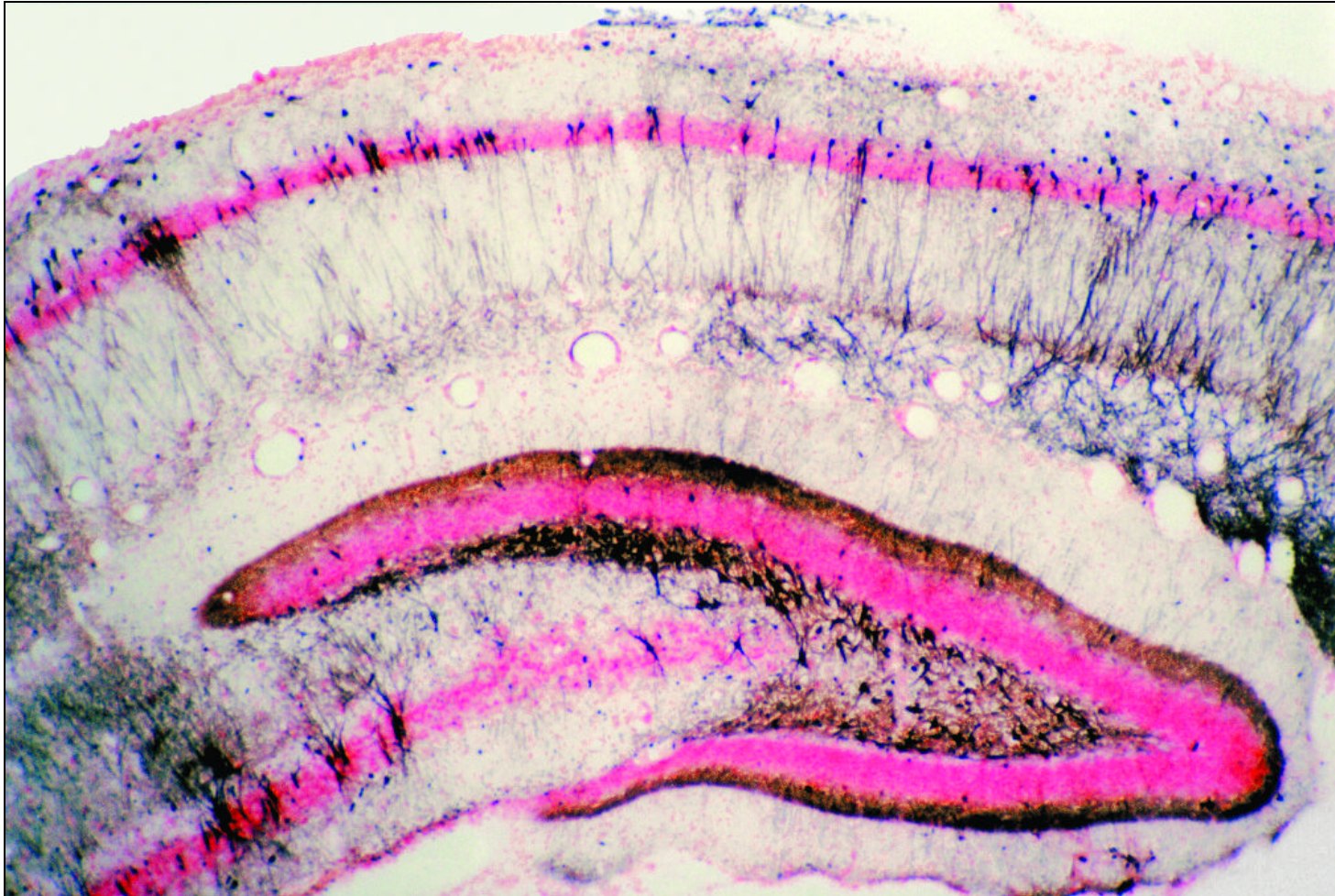
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Amino Cupric Silver Staining of the Hippocampus in a Rat Brain Exposed to Soman



All of the black areas reveal disintegrative degeneration.

The pink/red areas are the result of our Neutral Red counter-stain, which aids in the visibility of the normal, unaffected cells.



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