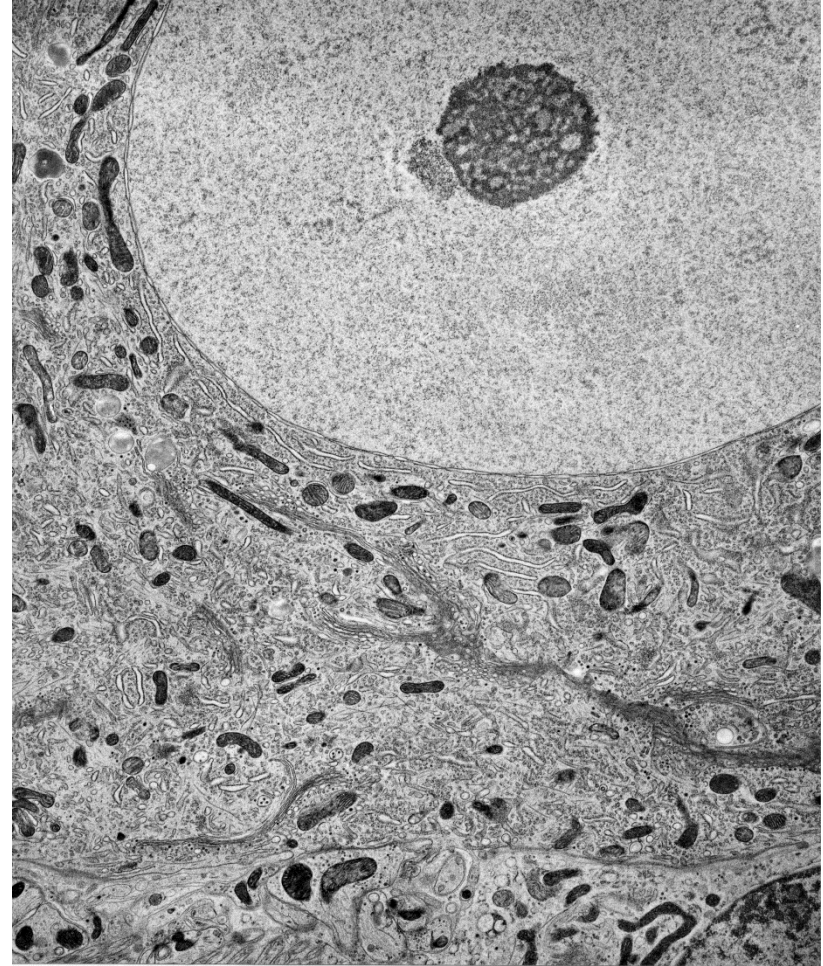
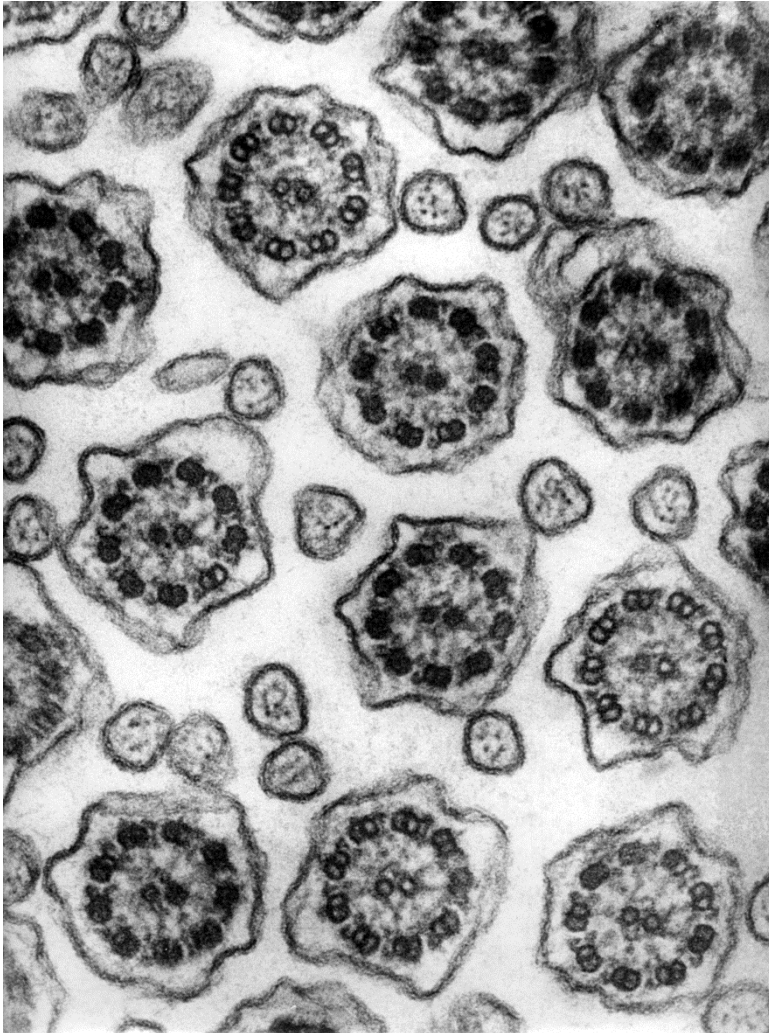
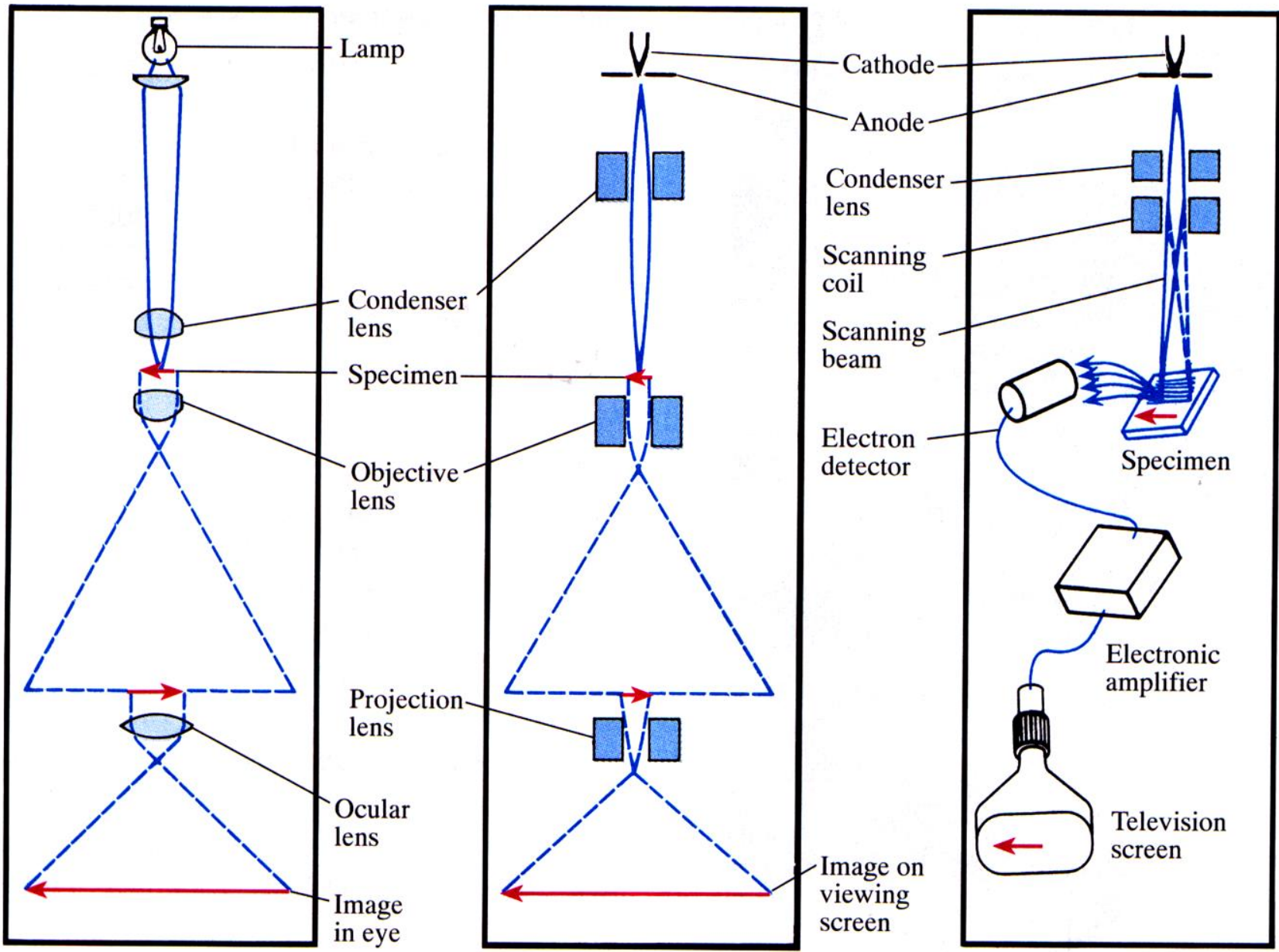


Electron- Microscopic Techniques

How to Prepare a good EM Photo



A thin section of the quick-frozen and substitution electron micrograph shows the cytoplasm of the Purkinje cell of the rat cerebellum. ($\times 11,400$.)



LIGHT MICROSCOPE

TRANSMISSION ELECTRON MICROSCOPE

SCANNING ELECTRON MICROSCOPE

N208a

200KV透過型電顕室
走査型透過型電顕室

火元責任者 廣川 信隆



High Voltage EM: (JEOL JEM-3100FEF) 300 KV and the accessory for the Cooling



TEM: JEOL JEM-2000EX II



TEM: HITACHI H-7100



TEM: HITACHI H-7500

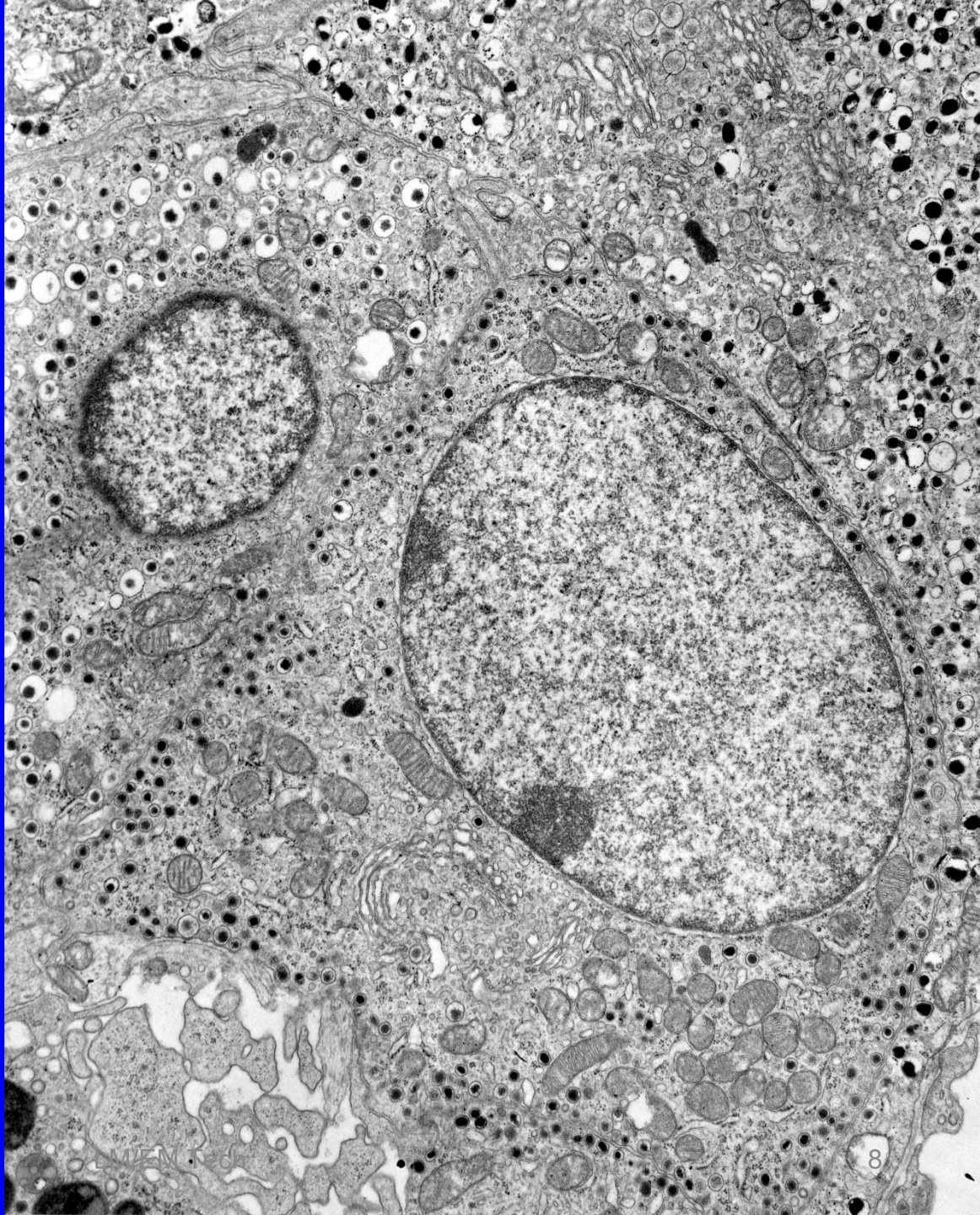
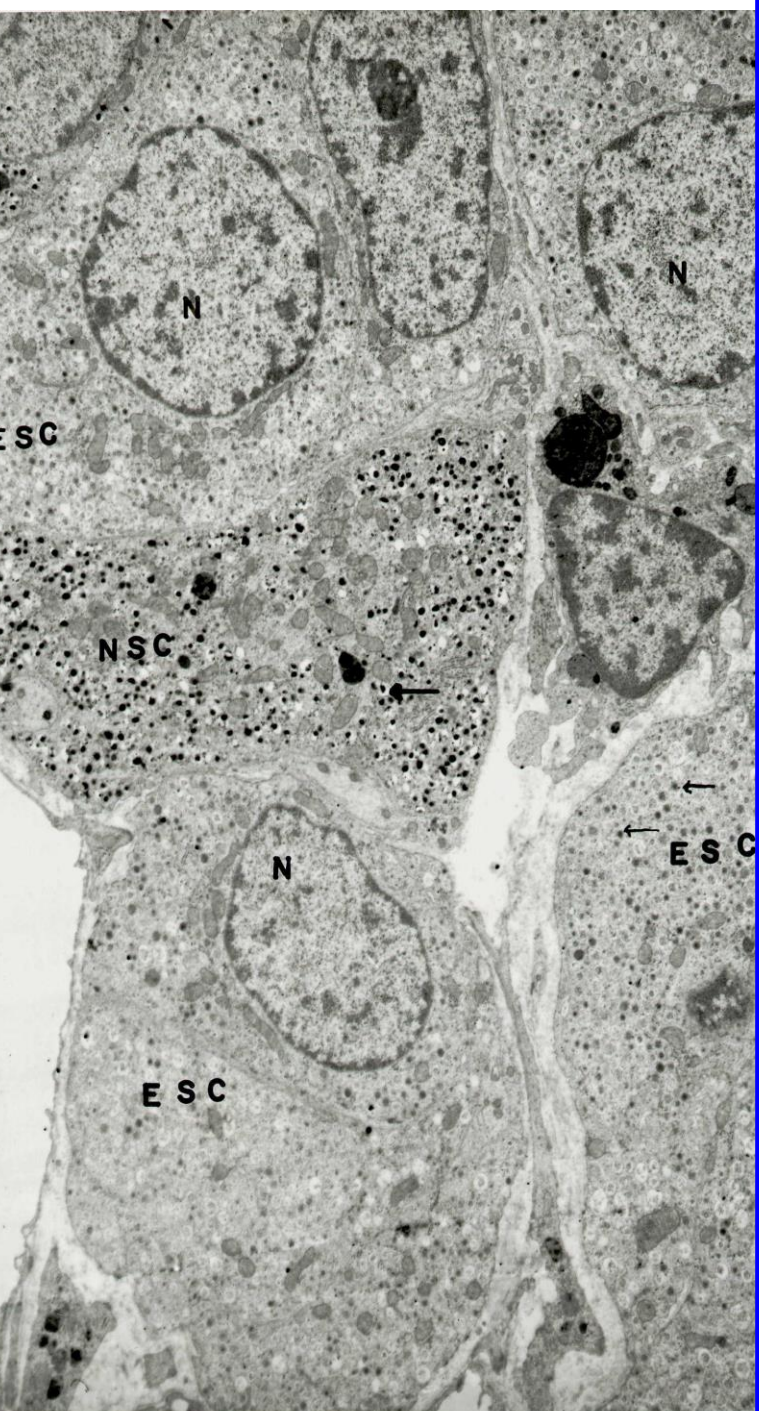
TEM: HITACHI H-7700

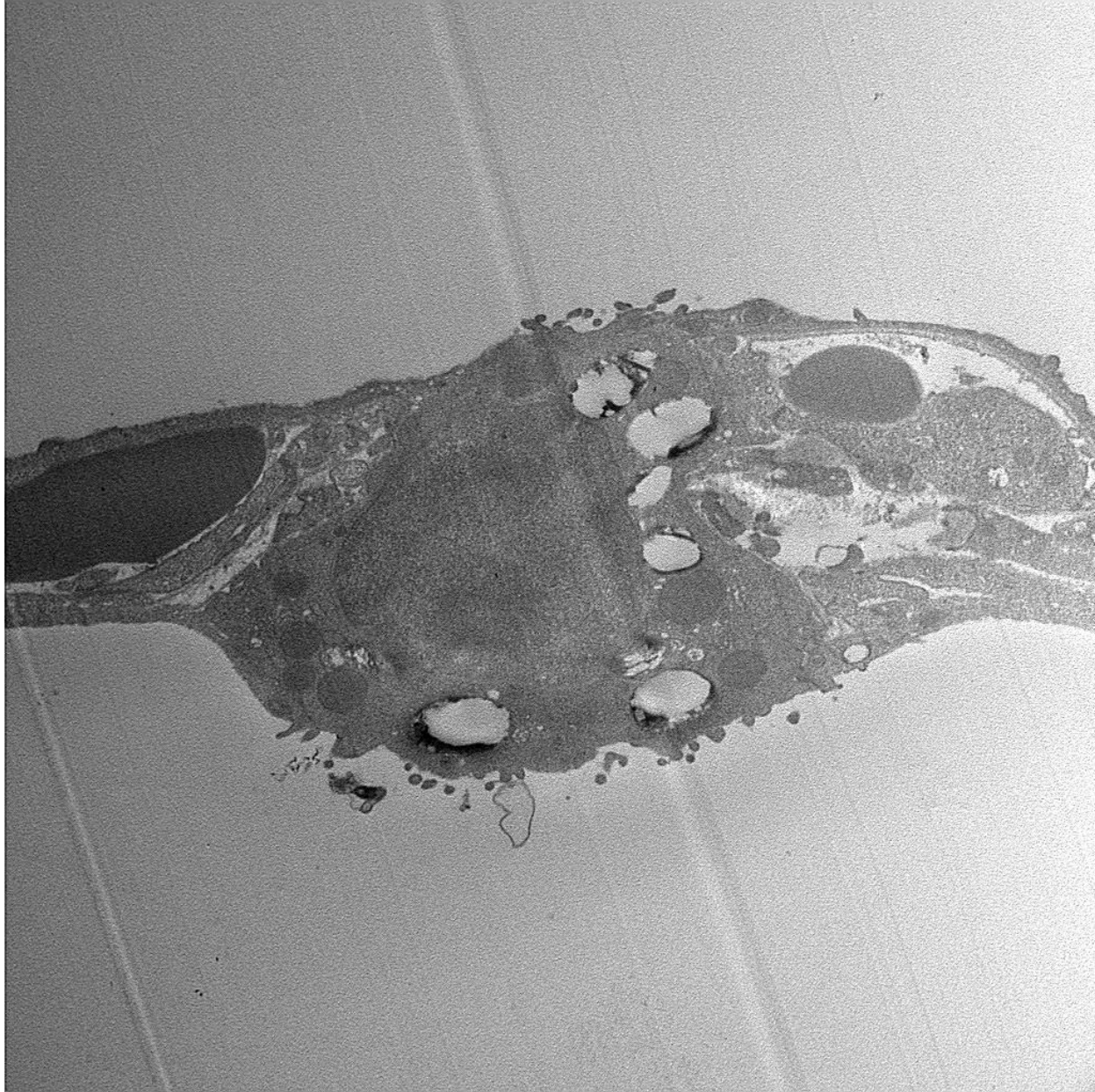


TEM: HITACHI H-7800

https://www.youtube.com/watch?time_continue=156&v=WbG4F2-jGu0&feature=emb_logo







009.tif

Print Mag: 11100x @ 7.0 in

13:50 08/04/10

2 microns

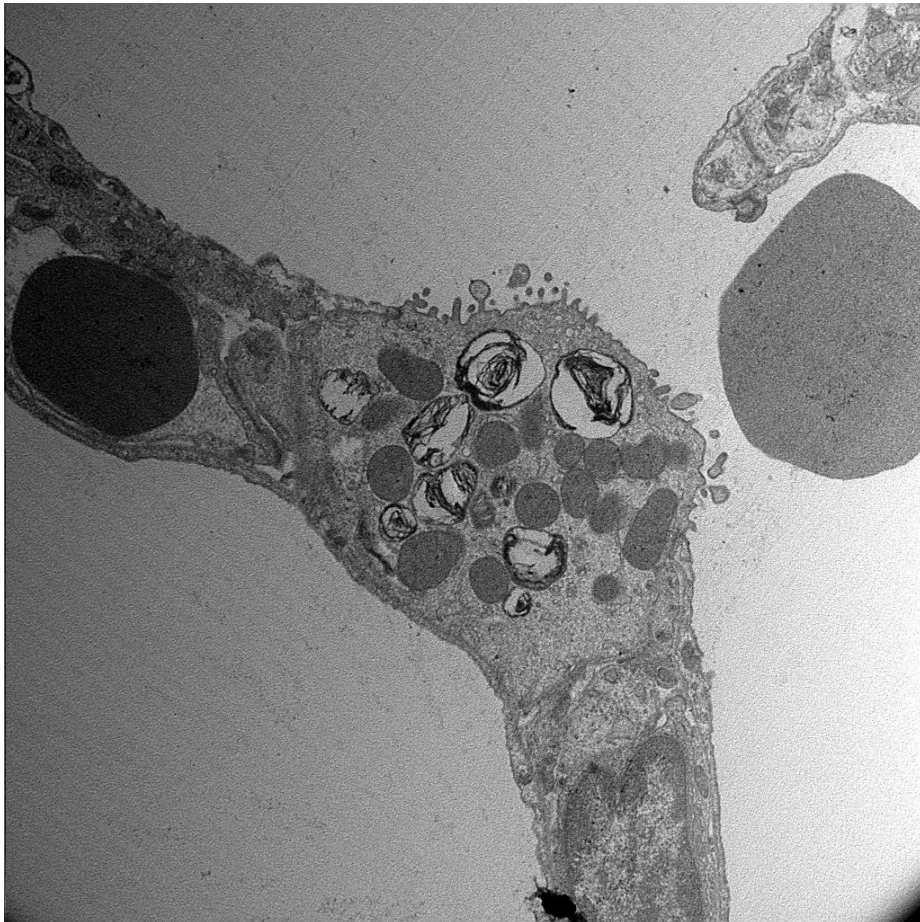
HV=100kV

Direct Mag: 6000x

Tilt:

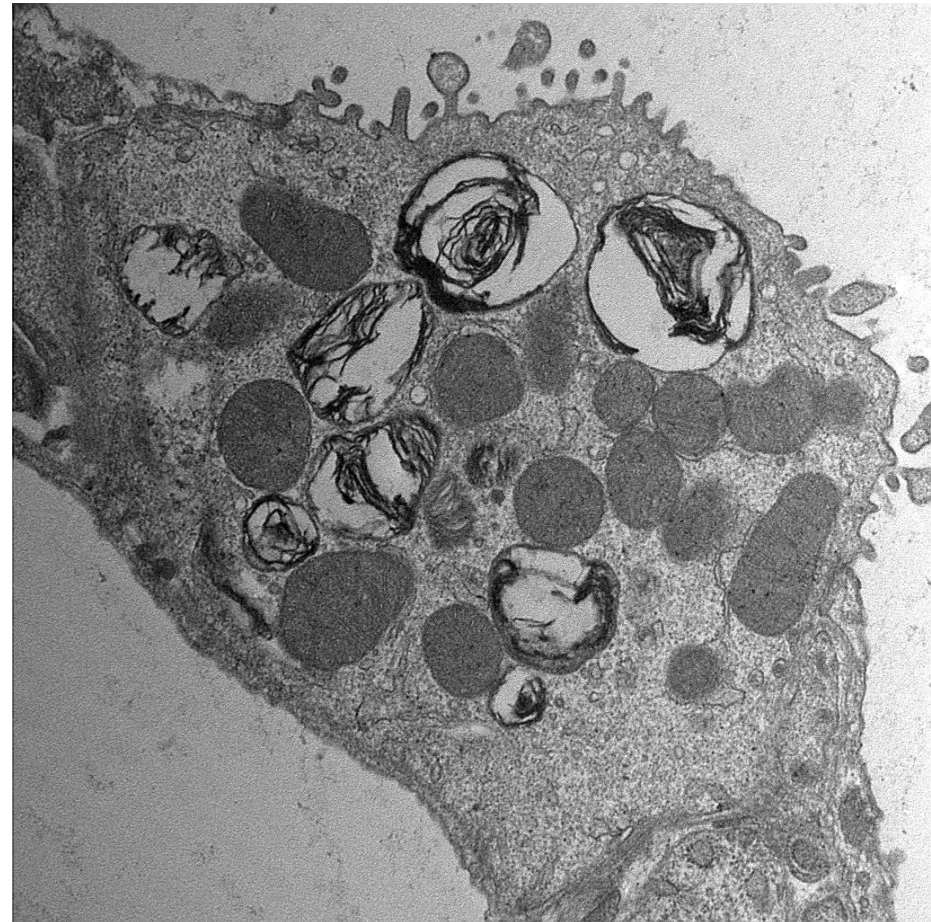
AMT Camera System

7/25/2024



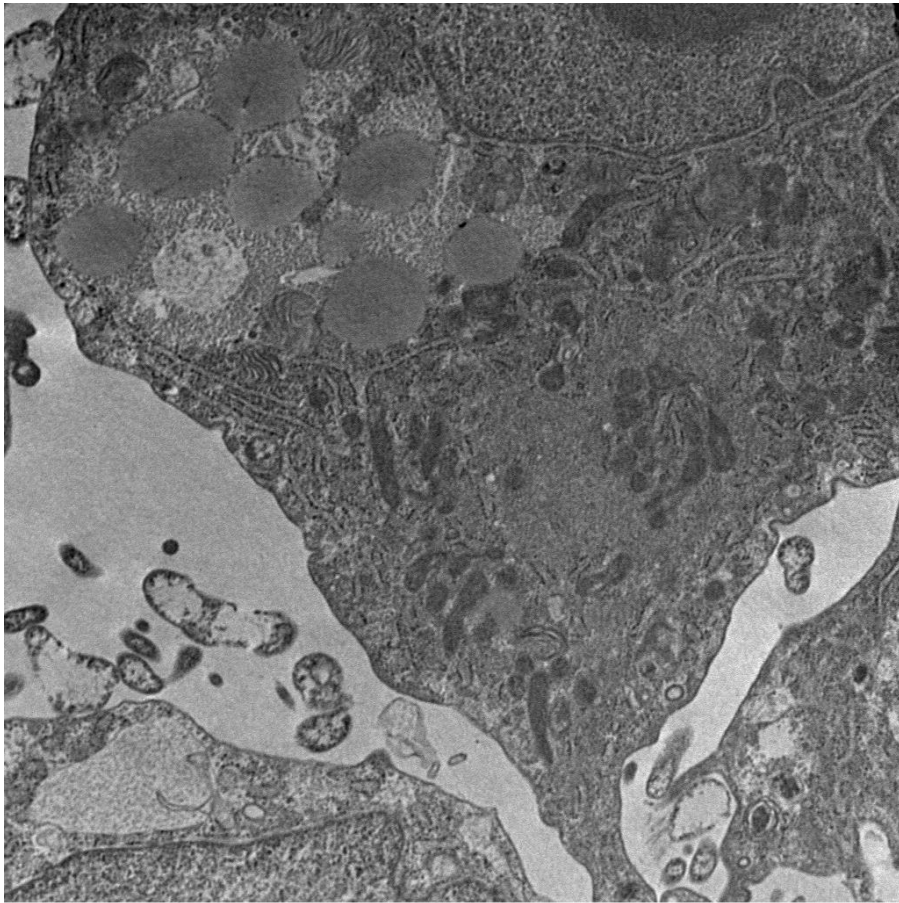
a01.tif
Print Mag: 11100x @ 7.0 in
13:57 08/04/10

2 microns
HV=100kV
Direct Mag: 6000x
Tilt:
AMT Camera System



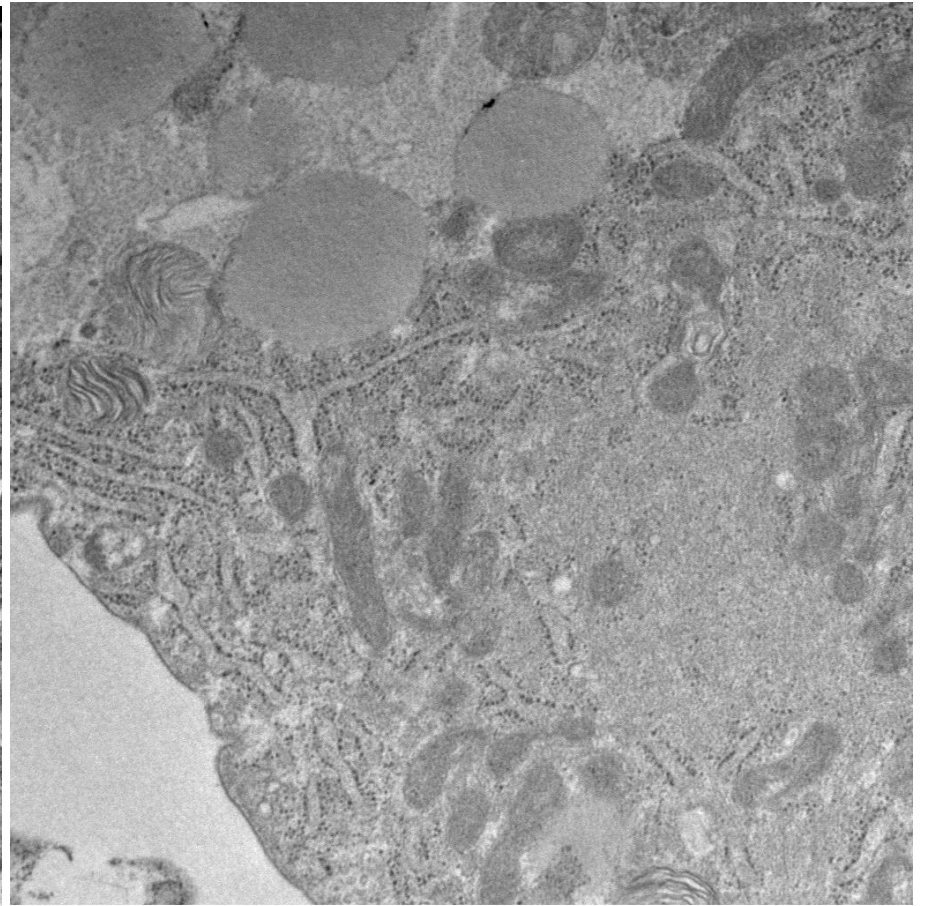
a02.tif
Print Mag: 22300x @ 7.0 in
13:58 08/04/10

500 nm
HV=100kV
Direct Mag: 12000x
Tilt:
AMT Camera System



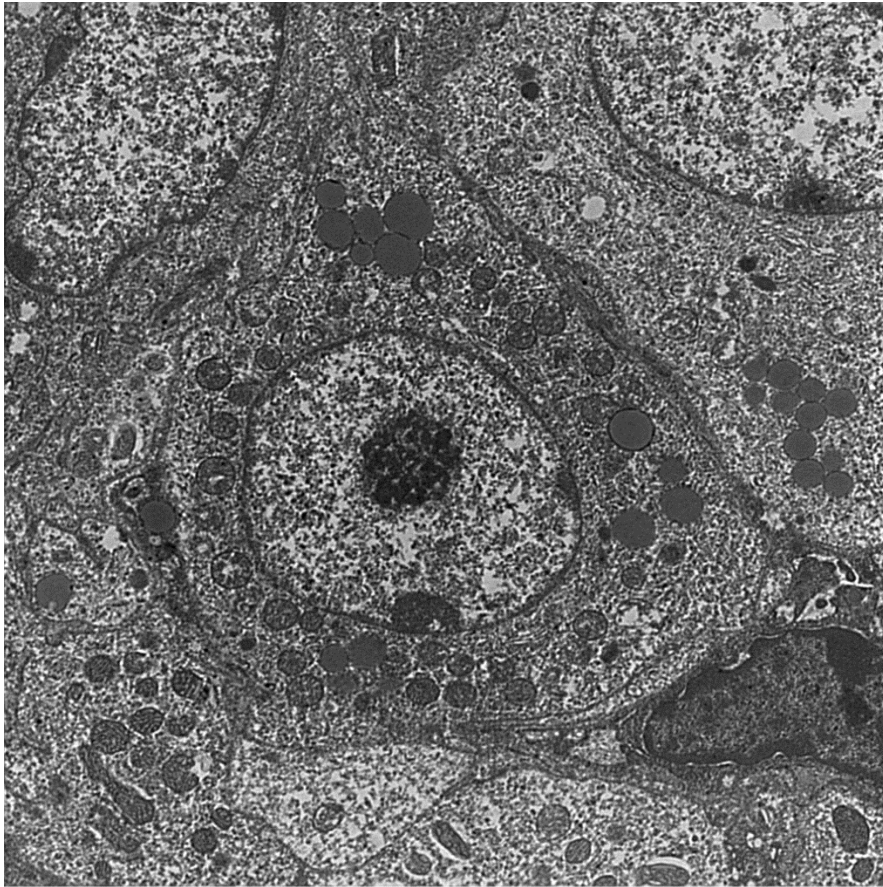
2-10k.tif
Print Mag: 19200x @ 7. in
14:51 06/04/04

500 nm
HV=100kV
Direct Mag: 10000x



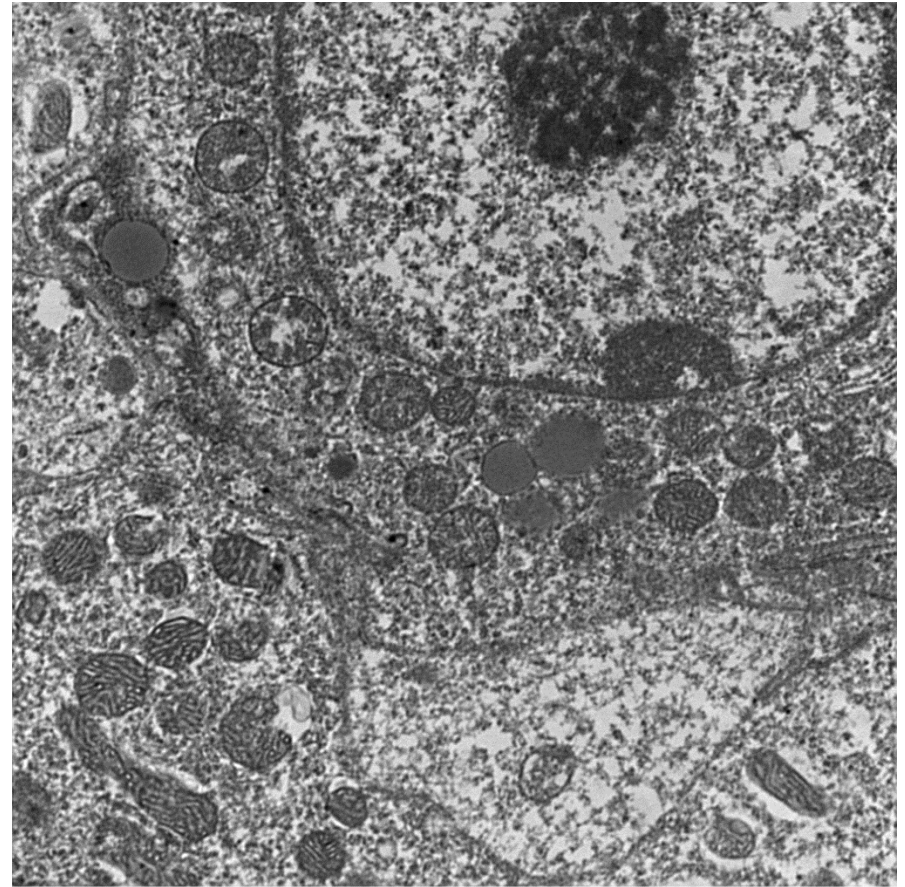
3-30k.tif
Print Mag: 38500x @ 7. in
14:53 06/04/04

500 nm
HV=100kV
Direct Mag: 20000x



35-8.tif
Print Mag: 9640x @ 7. in
16:27 04/20/04

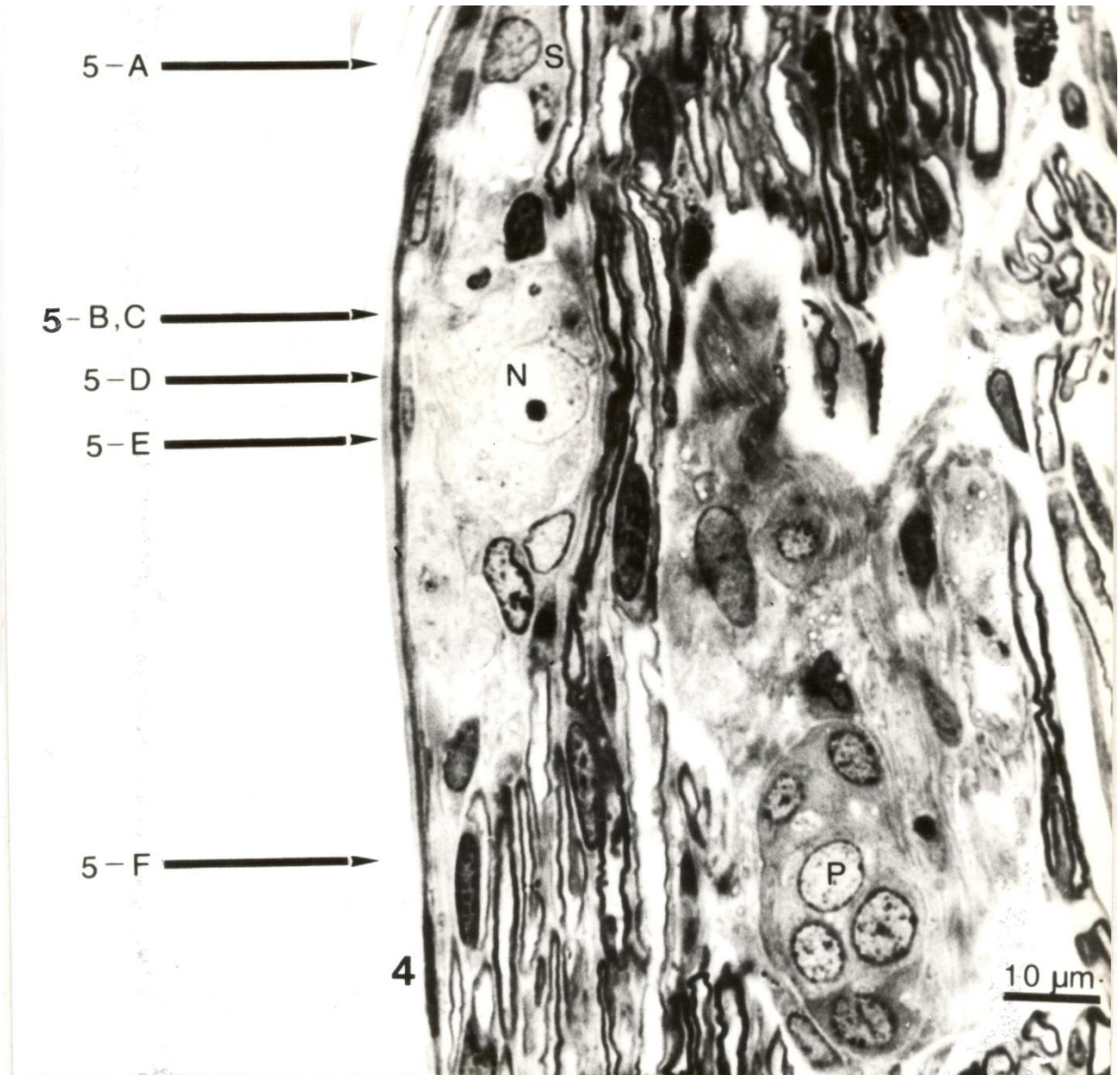
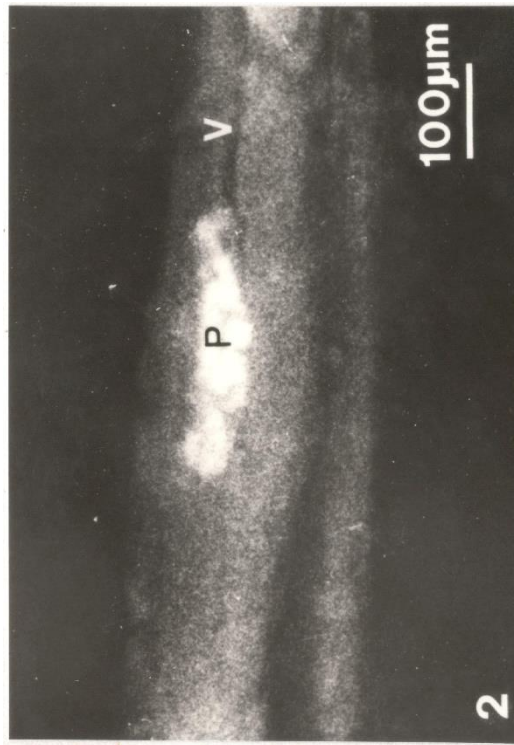
2 microns
HV=100kV
Direct Mag: 5000x



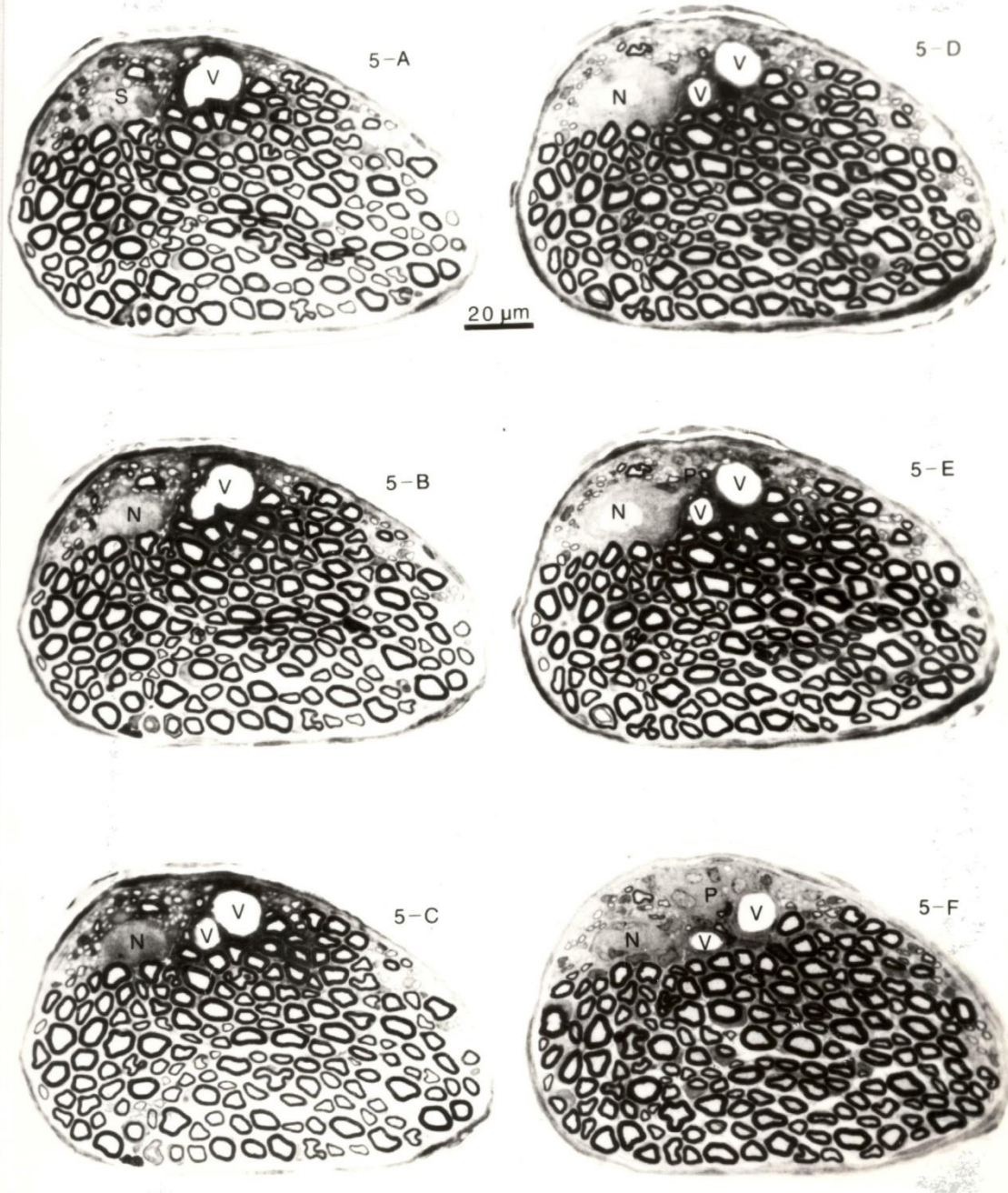
35-9.tif
Print Mag: 19200x @ 7. in
16:30 04/20/04

500 nm
HV=100kV
Direct Mag: 10000x

Paraganglia in Recurrent laryngeal nerve (Chien, 1989)



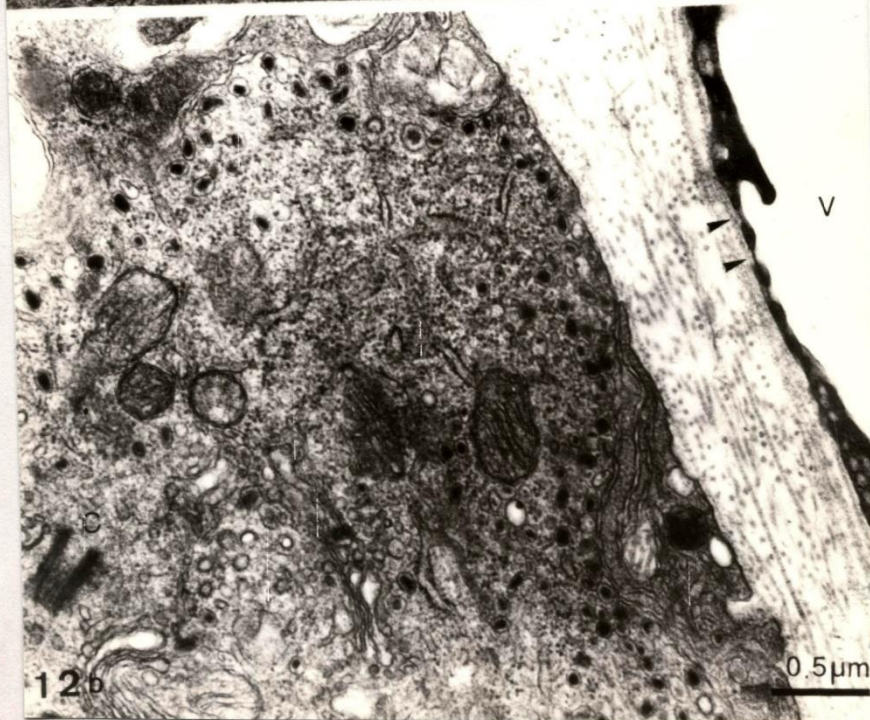
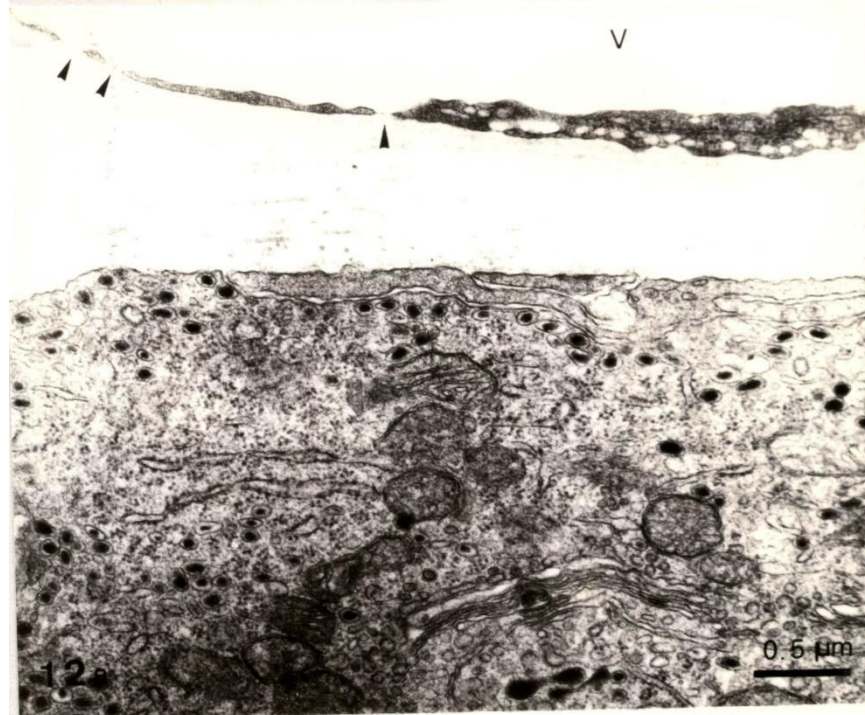
Find the ganglia
neuron (N) and
Paraganglia (P)
from the Semi-thin
sections of nerves



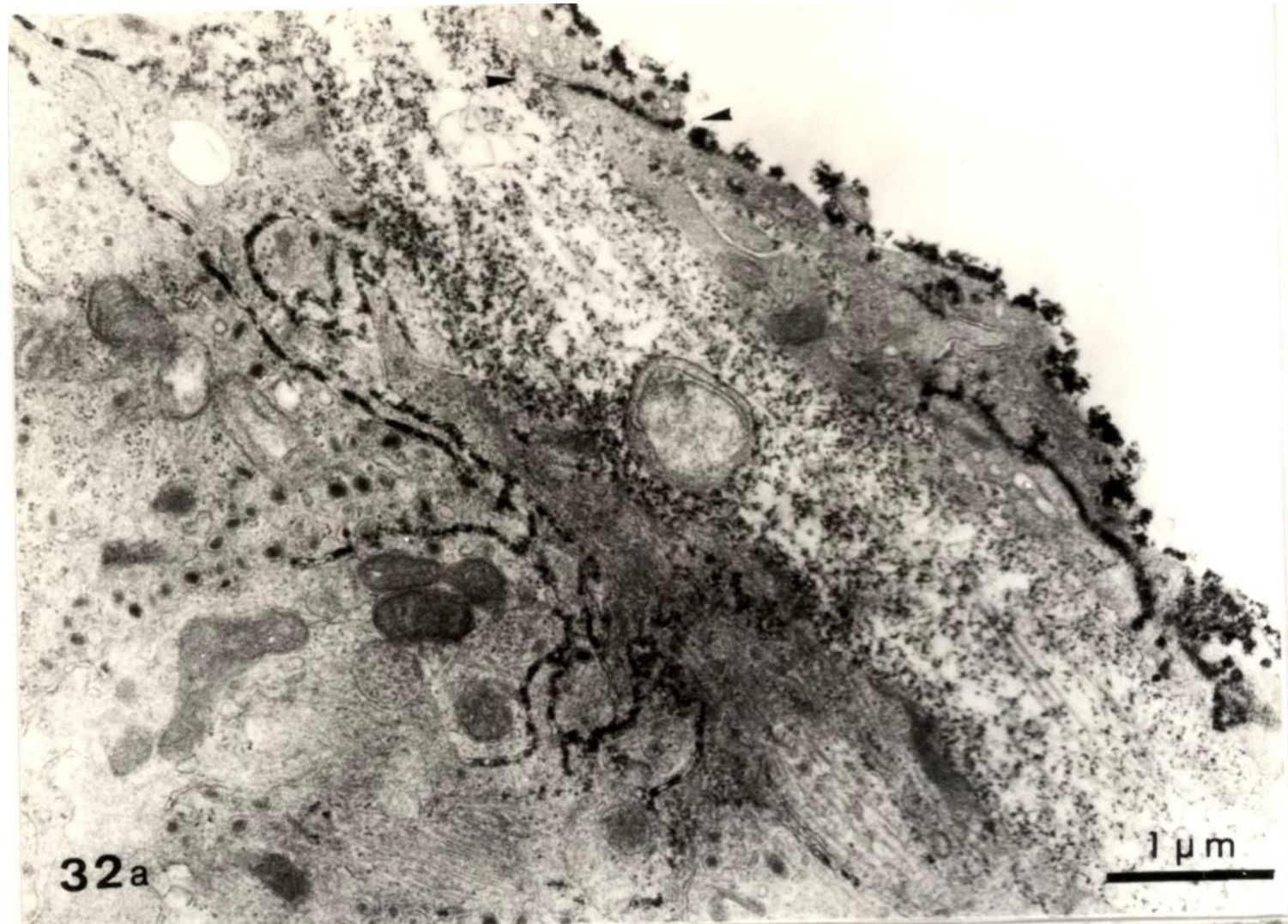
(Chien, 1989)

Blood vessel (V)
Fenestrated capillary
Next to the paraganglia
cells

(Chien, 1989)



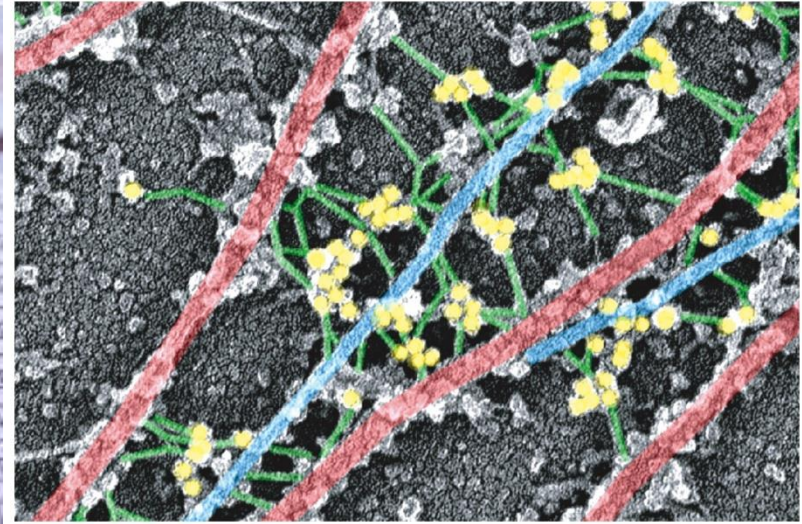
La³⁺ 鐳離子灌流探討 Blood-Nerve Barrier



La³⁺ 鐳離子灌流探討 Blood-Nerve Barrier



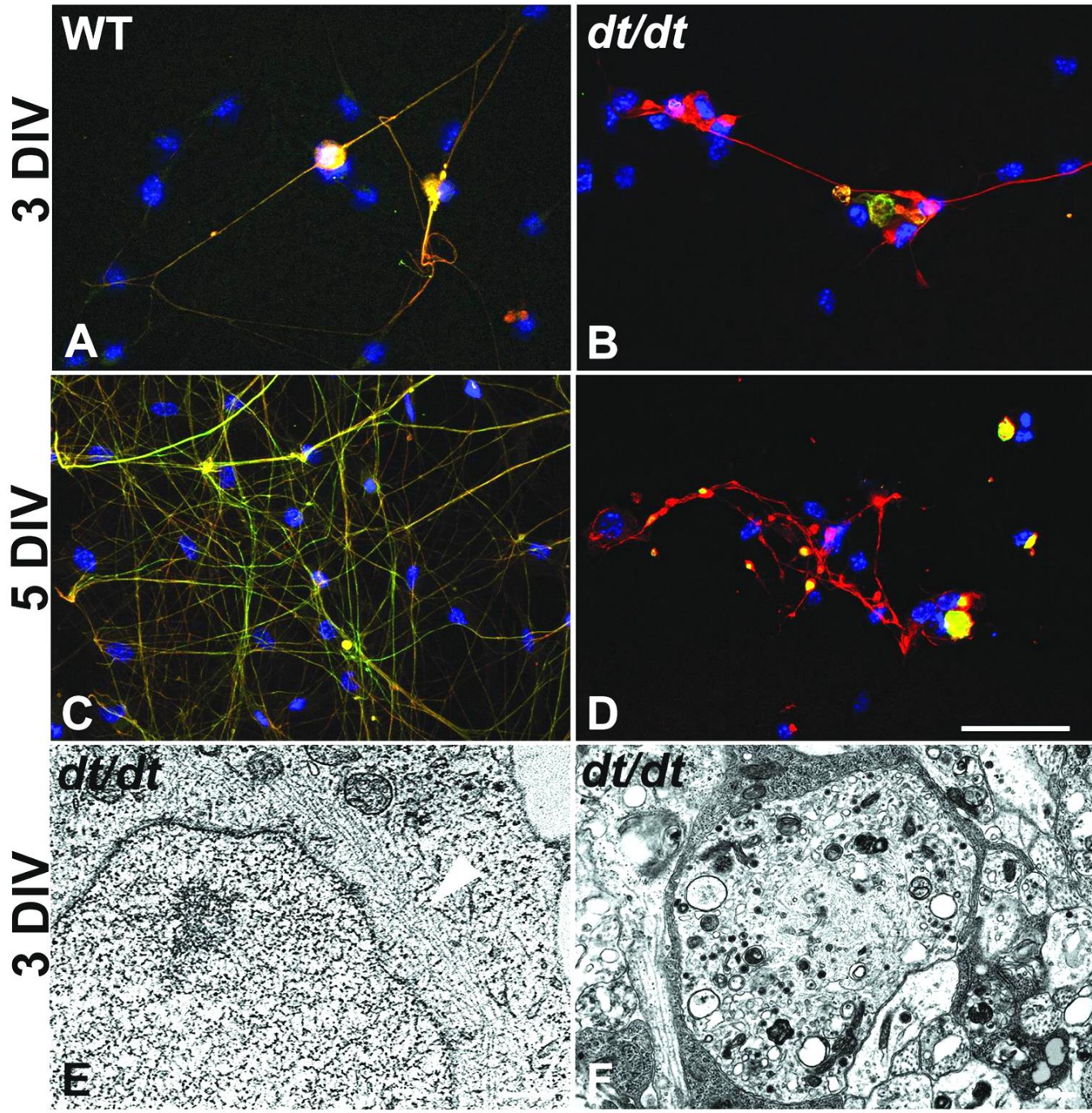
Nature Mutant for Neuronal Degeneration



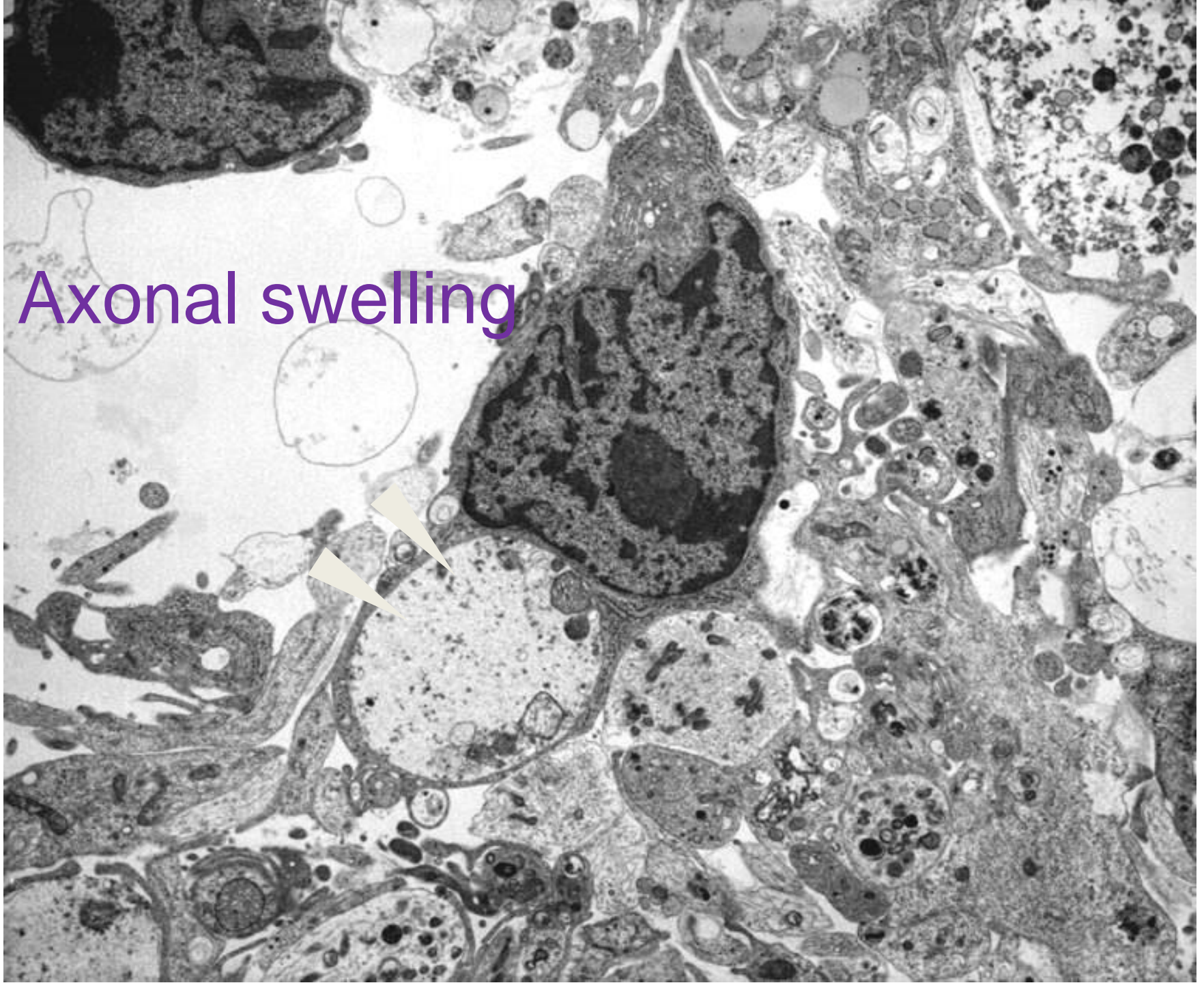
- *Dystonia musculorum (dt)* mouse is a recessive hereditary sensory neuropathy of the mutant mouse, which is defective in *BPAG1* gene.
- Mice affected with *dt* are seemingly normal at birth, but by 10–12 days they begin twitching, writhing, and exhibiting uncoordinated movements.
- **BPAG1** cross-links the intermediate filaments and other cytoskeletons.

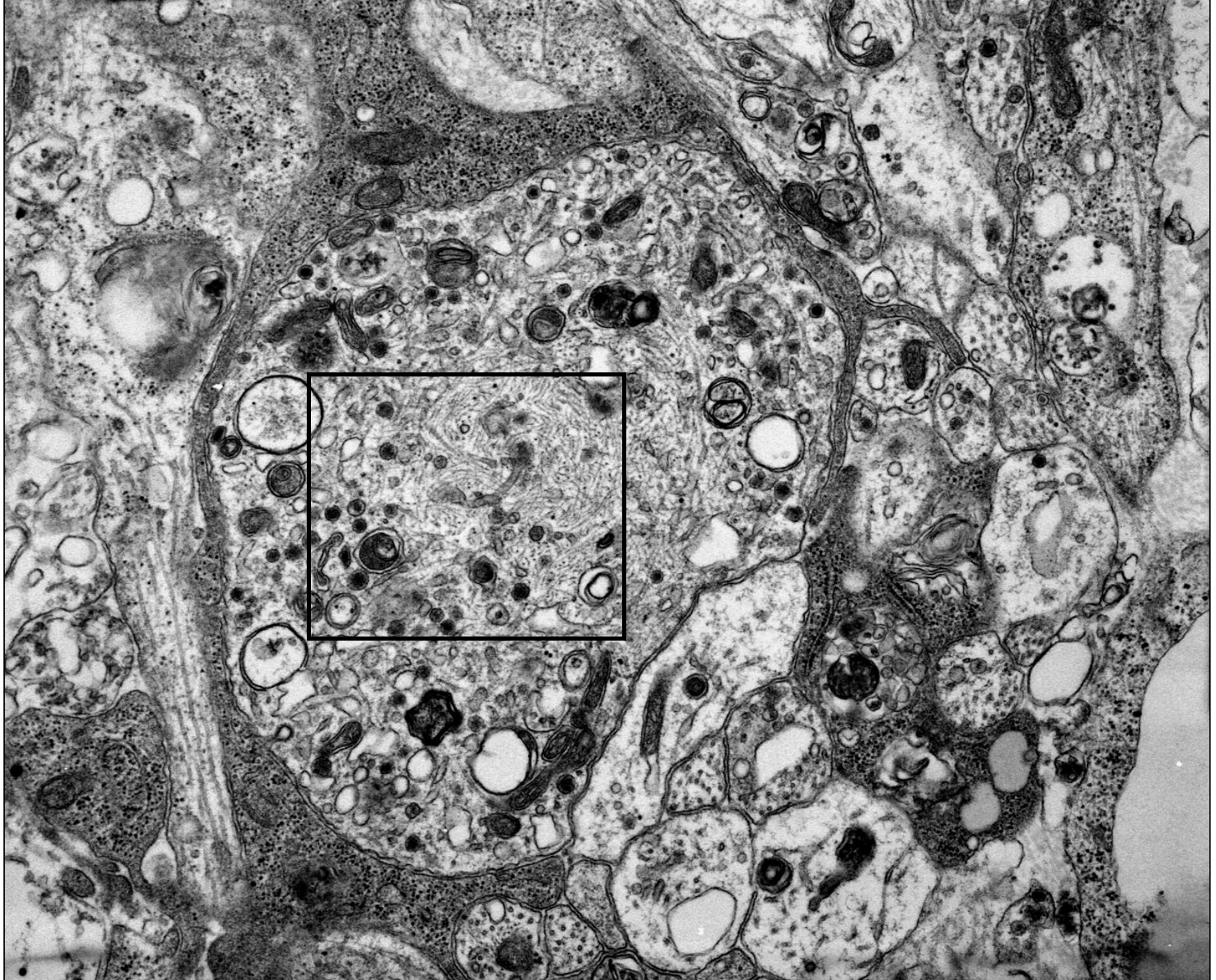
Cultured DRG
neurons
from E15.5
embryos

α -interneixin proteins
are accumulated in
the cell bodies as
well as in the
processes of *dt/dt*
neurons.



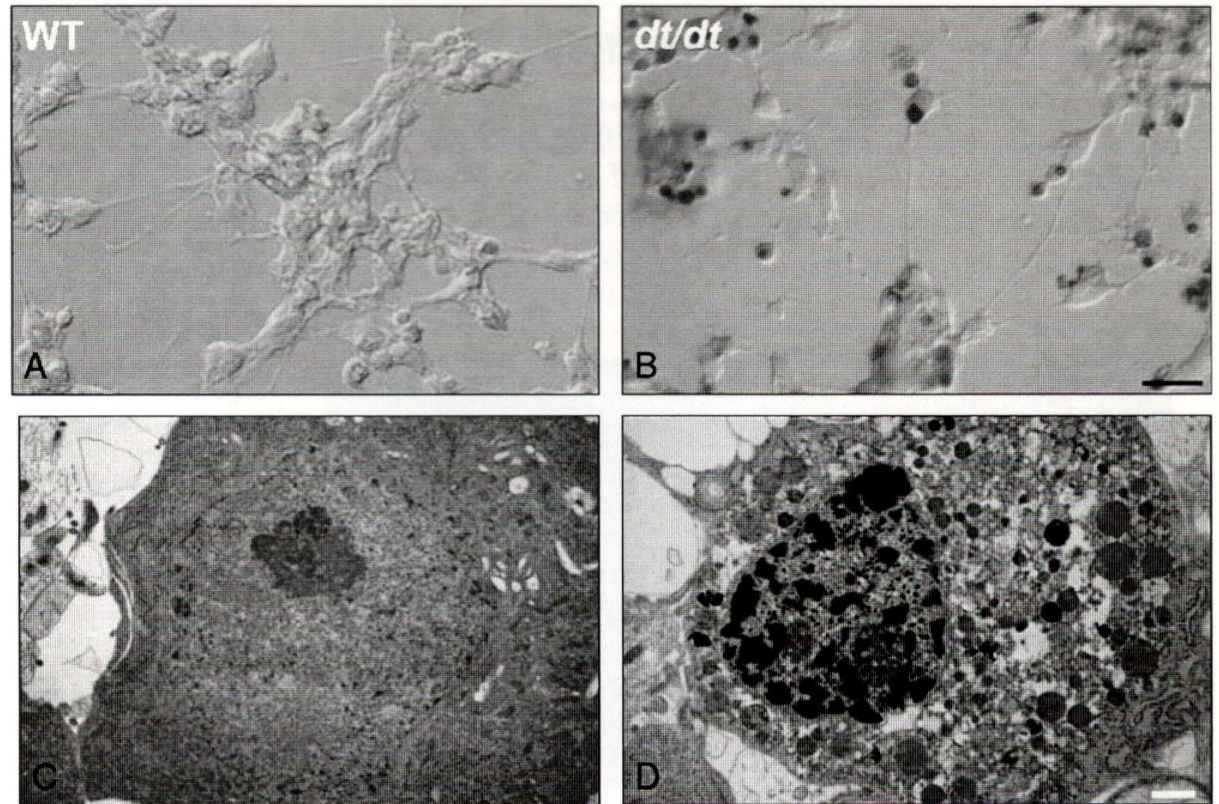
Axonal swelling





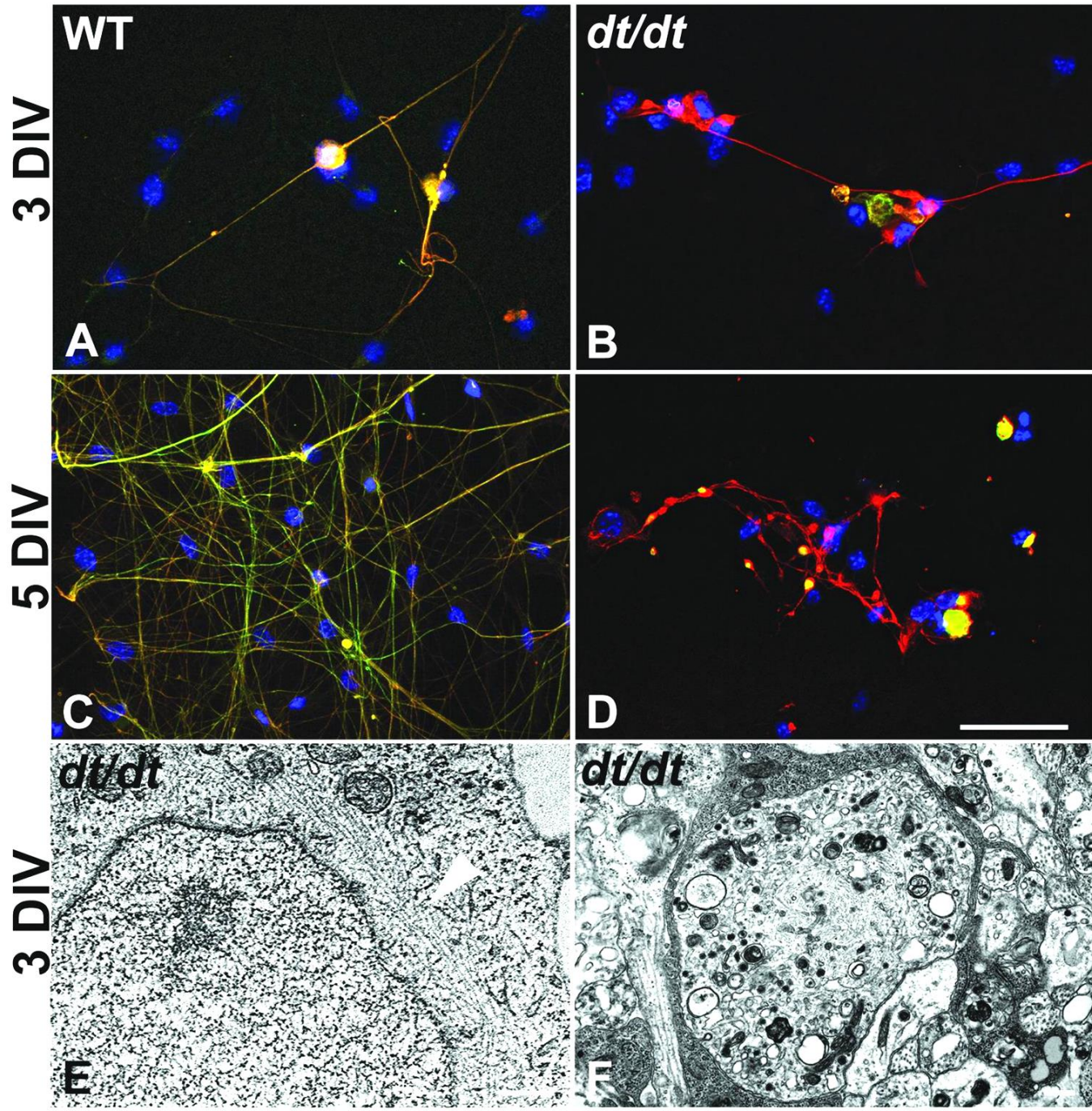
DIC Image with TUNEL staining + EM

FIGURE 7. TUNEL assays and ultrastructural observations on the cell death of cultured DRG neurons at 5DIV from the wild-type and *dt* mutant mice. No TUNEL-positive cells could be found from the cultured DRG cells of wild-type embryos (A), but some TUNEL-positive cells could be detected from those of *dt/dt* embryos (B). At the ultrastructural level, the cell nucleus of DRG neuron from wild-type embryos exhibited typical nuclear morphology with a nucleolus (C), whereas the nucleus of DRG neuron from *dt/dt* embryos exhibited apoptotic characteristic of chromatin condensation with intact nuclear envelope (D). Scale bars = (A, B) 40 μ m; (C, D) 1 μ m.



Cultured DRG
neurons
from E15.5
embryos

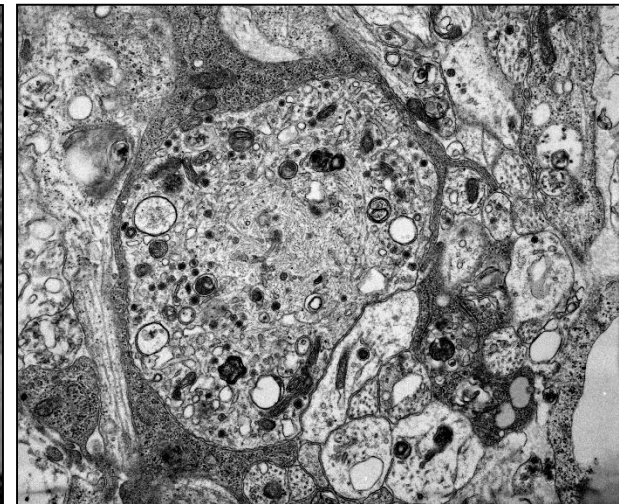
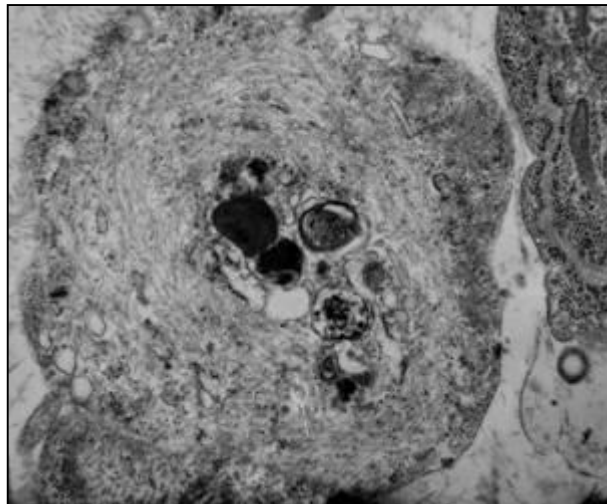
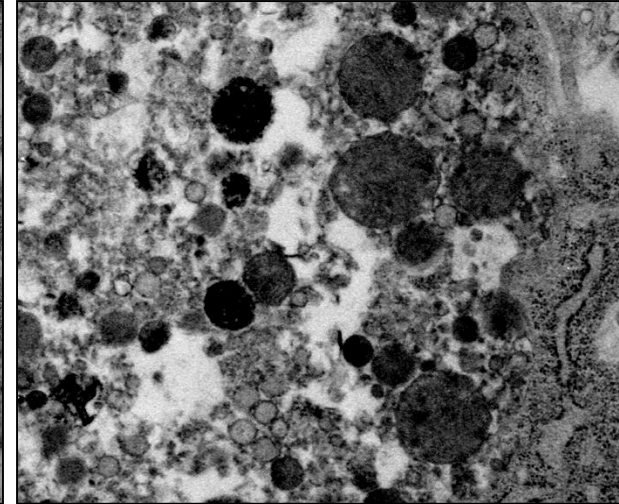
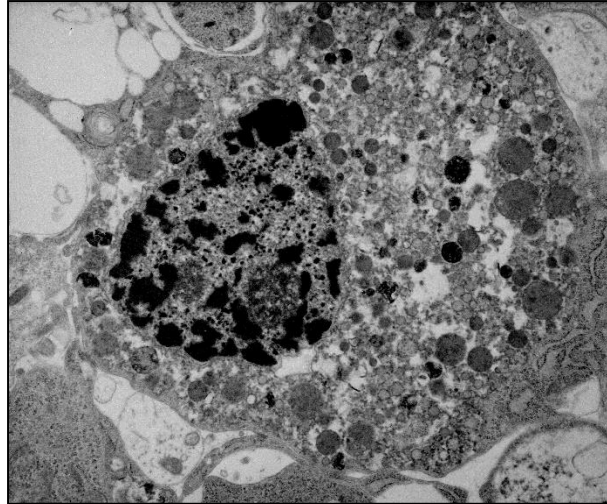
α -interneixin proteins
are accumulated in
the cell bodies as
well as in the
processes of *dt/dt*
neurons.



Primary culture of DRG neurons

DRG neurons of *dt/dt* mice observation by Electron microscope

- Chromatin condensation
- IFs accumulation
- Axonal swelling



- Cell apoptosis

Pre-embedding immunoEM

Tseng et al.,
J. Comp. Neurol. 2008

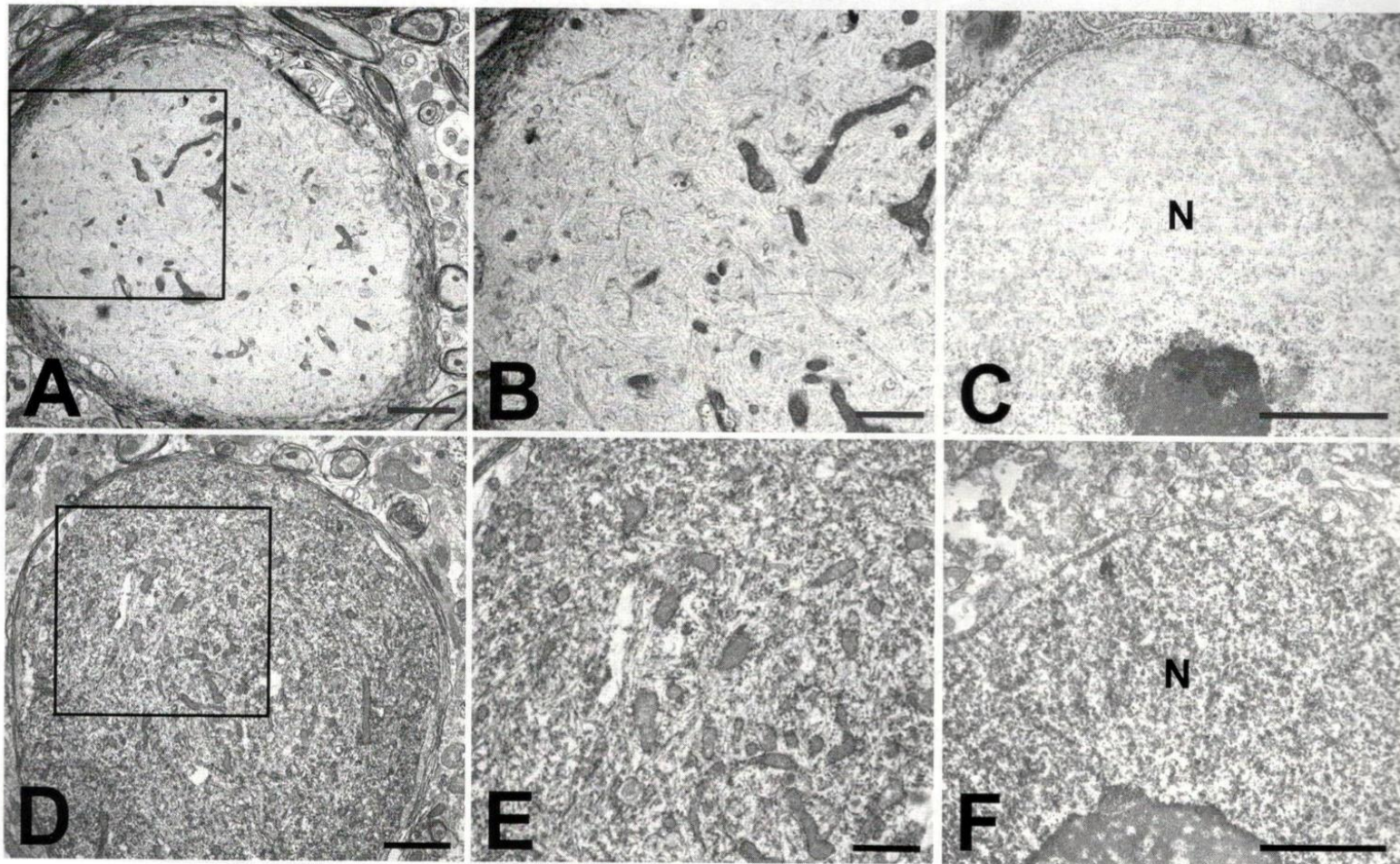


Fig. 6. Preembedding immunoelectron microscopy of the swelling axon and the nucleus of motor neuron from *dt/dt* mutant. Ultrathin sections obtained from *dt/dt* spinal cords were stained with uranyl acetate and lead citrate (A-C), or stained with antibody to α -internexin (D-F), and examined by electron microscopy. Randomly orientated intermediate filaments and axonal organelles were found in the swelling axons (A,B), yet the morphology of the cell nucleus looked normal in the spinal neuron of the *dt/dt* (C). α -Internexin (dark DAB reaction products) was detected in the swelling axon (D,E) and also in the nucleus (F) of spinal motor neuron by immunoelectron microscopy. N, nucleus. Scale bars=1 μ m in A,D; 500 nm in B,C,E,F.

Post-embedding immunoEM

Tseng et al.,
J. Comp. Neurol. 2008

The Journal of Comparative Neurology. DOI 10.1002/cne

ABNORMAL TRANSLOCATION OF α -INTERNEXIN

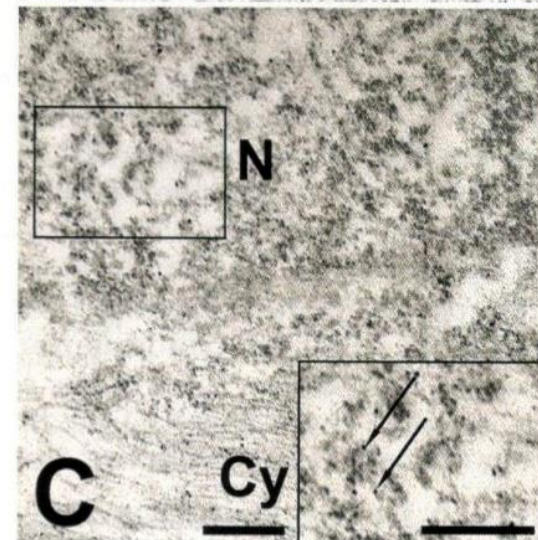
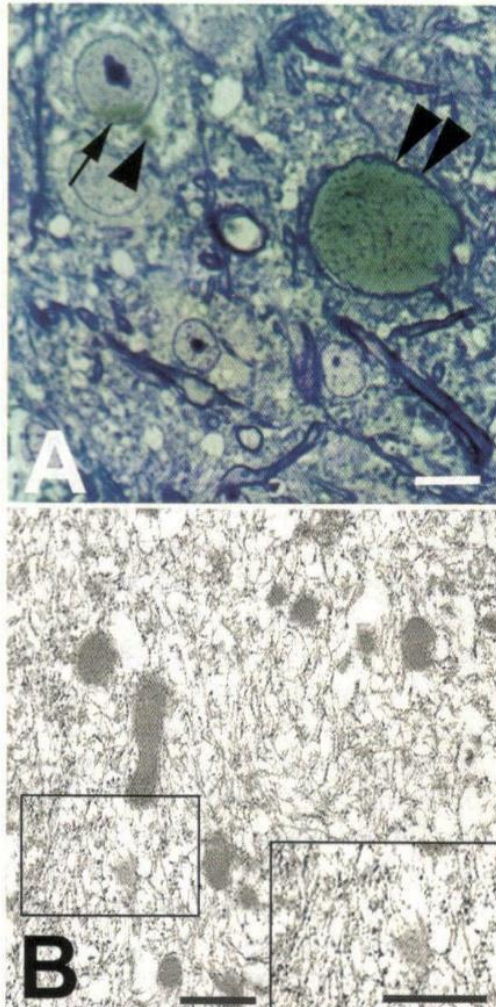
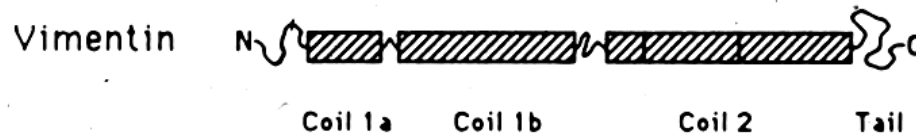
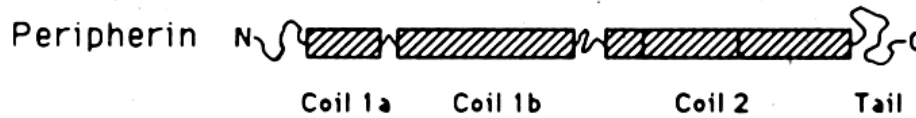


Fig. 7. Postembedding immunoelectron microscopy of swelling axon and the nucleus of motor neuron from *dt/dt* mutant. Sections were stained with antibody to α -internexin and then revealed by DAB reaction (A) or gold particles (B,C). In the semithin section, immunopositive α -internexin was found in the cytoplasm (arrowhead) and also in the nucleus (arrow) of spinal motor neuron. Further, immunopositive α -internexin was also observed in the myelinated swelling axon (double arrowheads) in the ventral horn of *dt/dt* mice (A). In the ultrathin section, filamentous α -internexin labeled with 10 nm gold particles was found in the swelling axon (B) and cytoplasm (C). Note that some immunopositive gold particles (arrows) were found in the cell nucleus (C). Cy, cytoplasm; N, nucleus. Scale bars=20 μ m in A; 500 nm in B,C.

Seven Intermediate Filament Proteins in Neural Differentiation



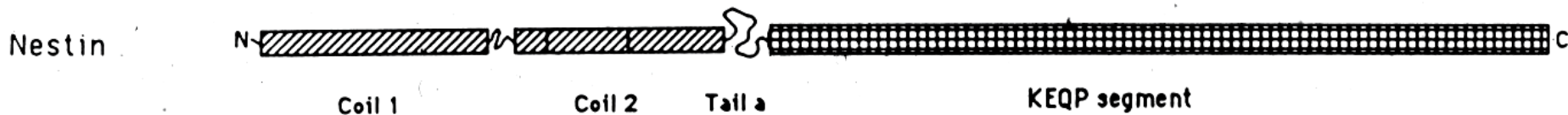
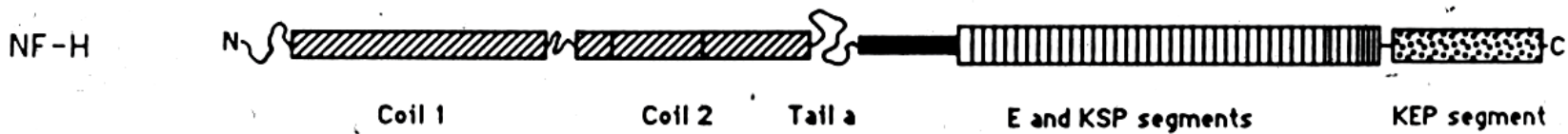
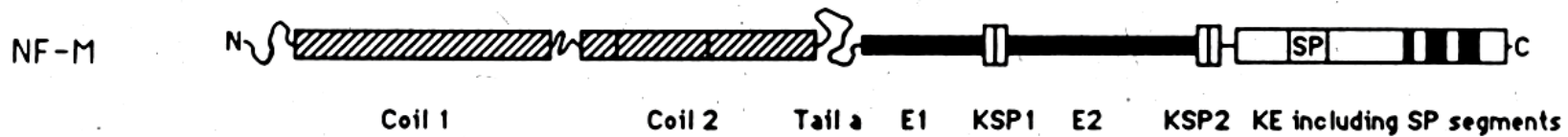
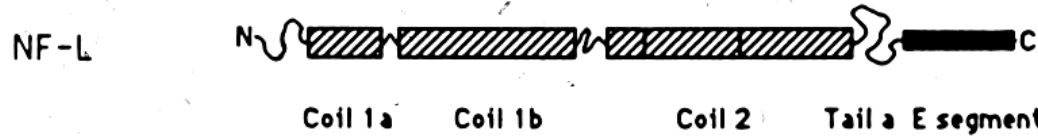
Neuroepithelial stem cells



First neuronal IF in PNS

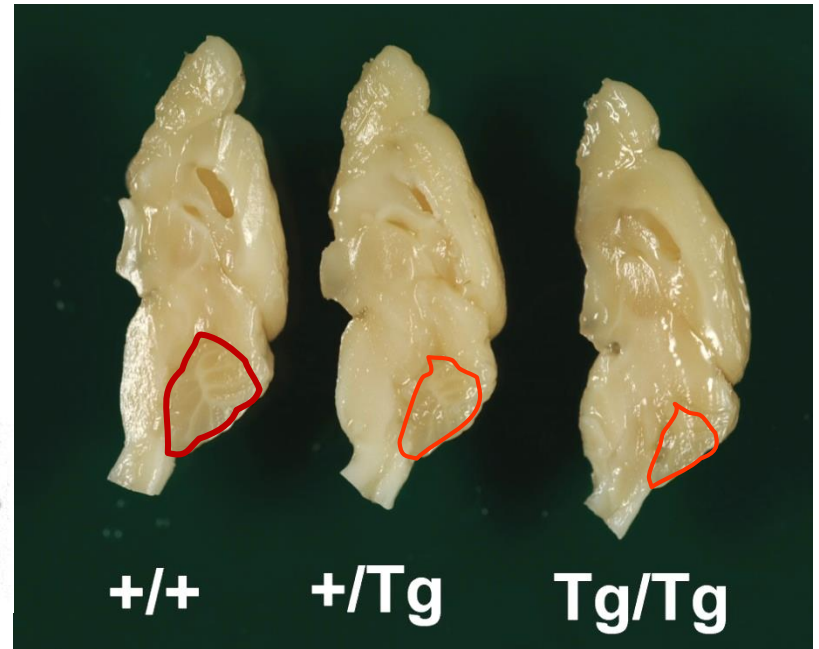
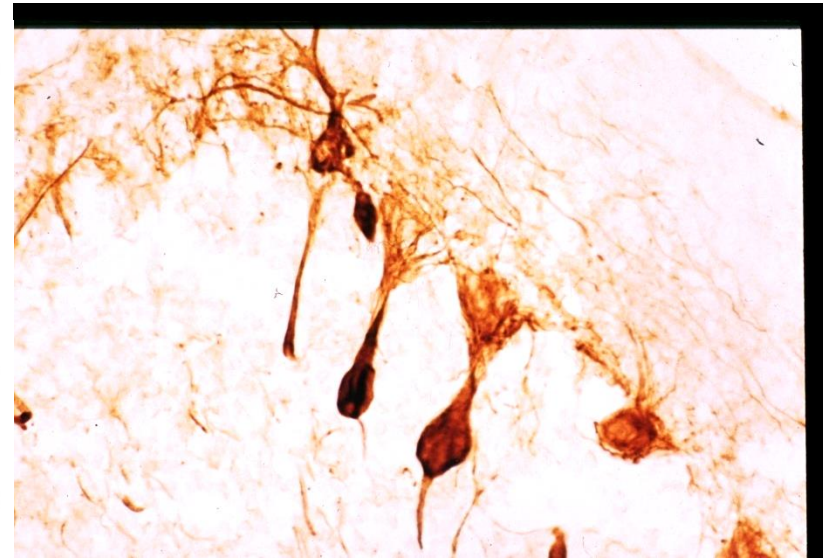
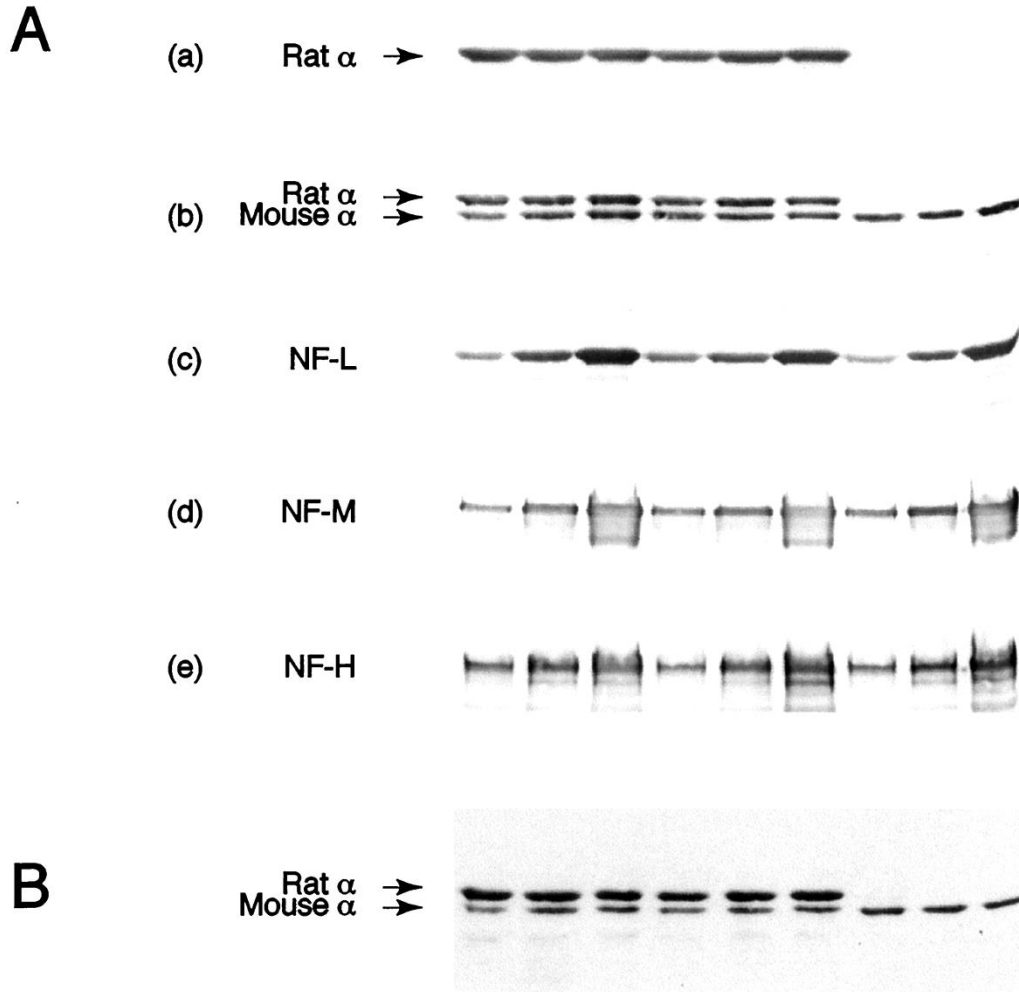


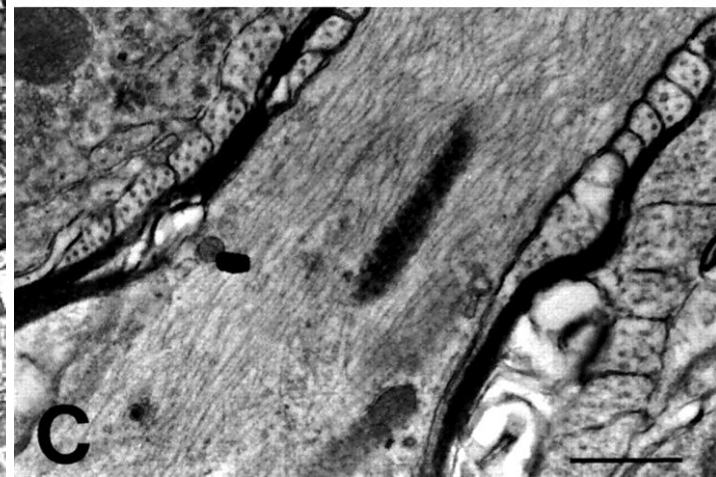
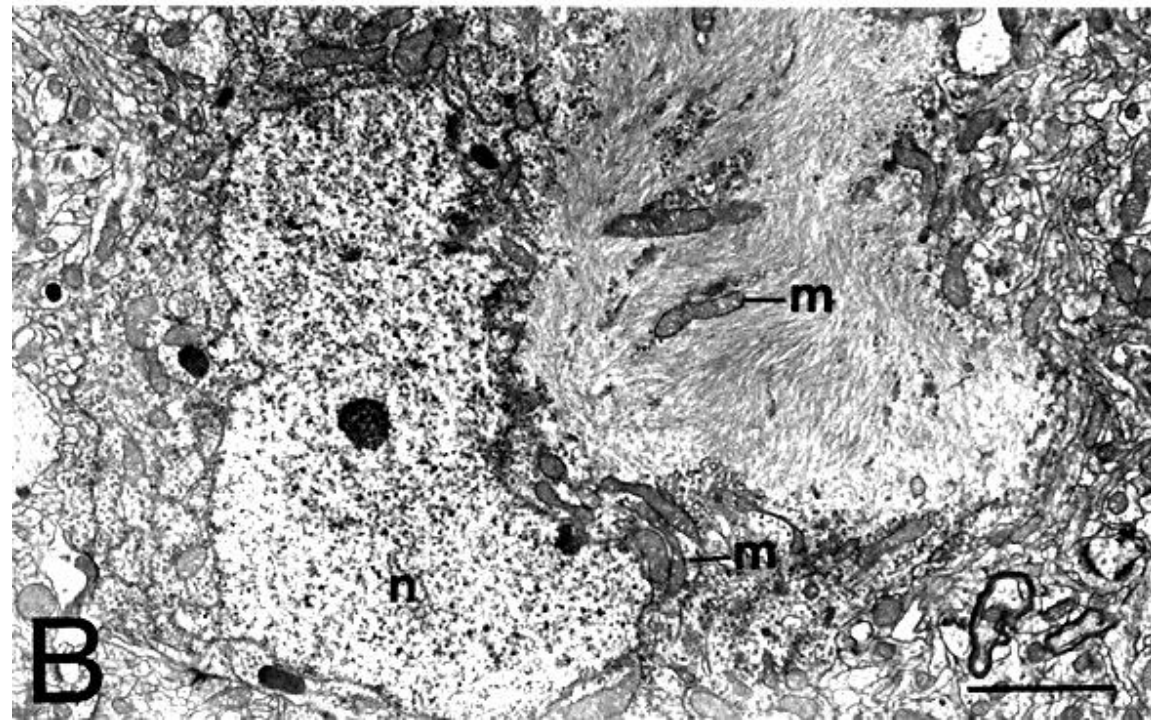
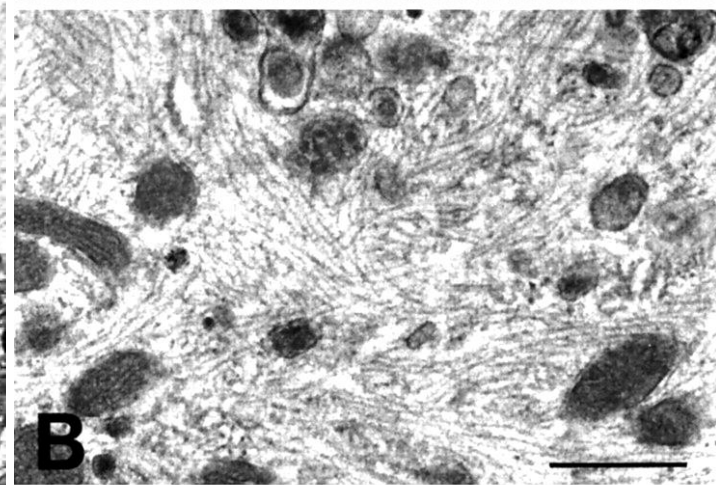
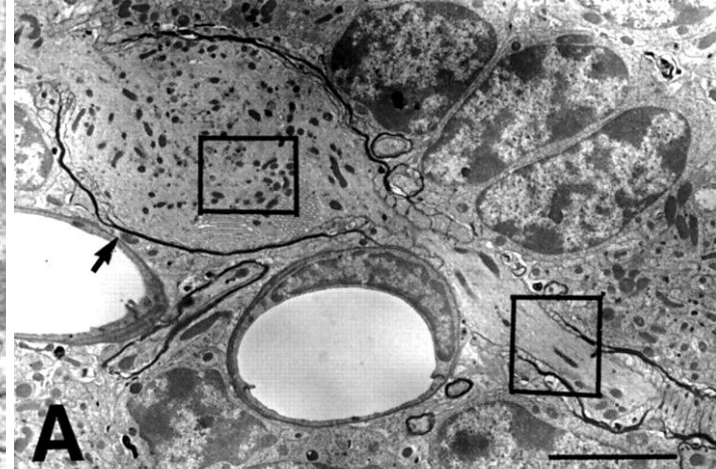
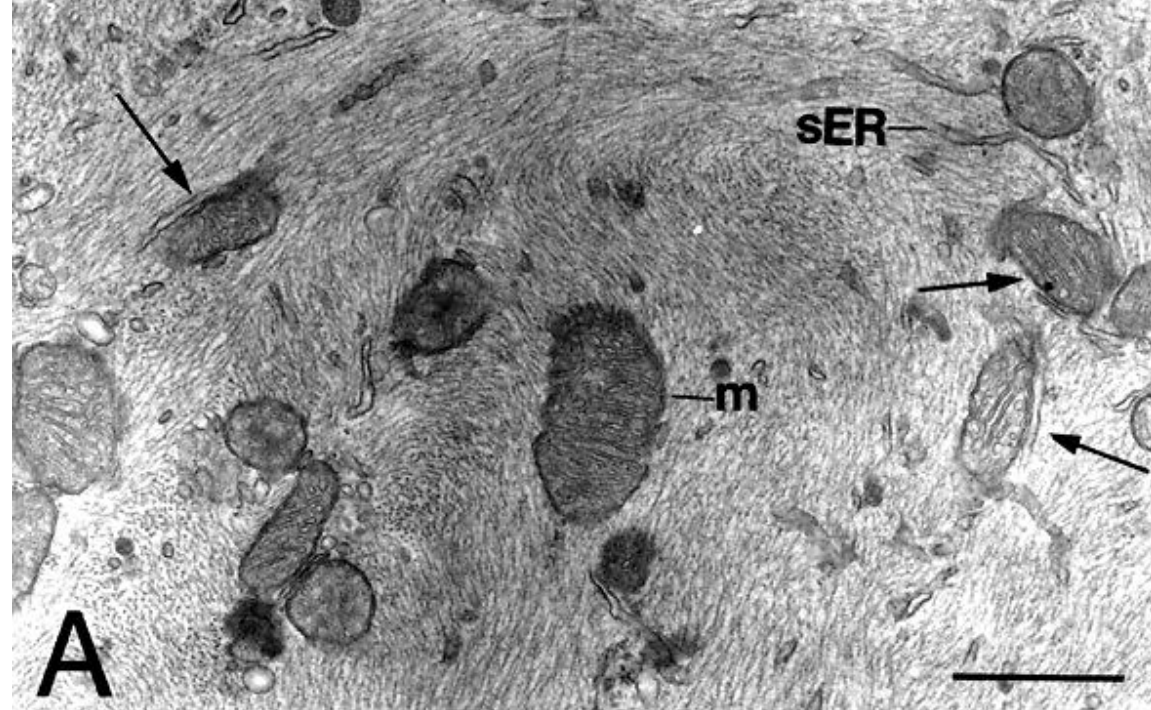
First neuronal IF in CNS



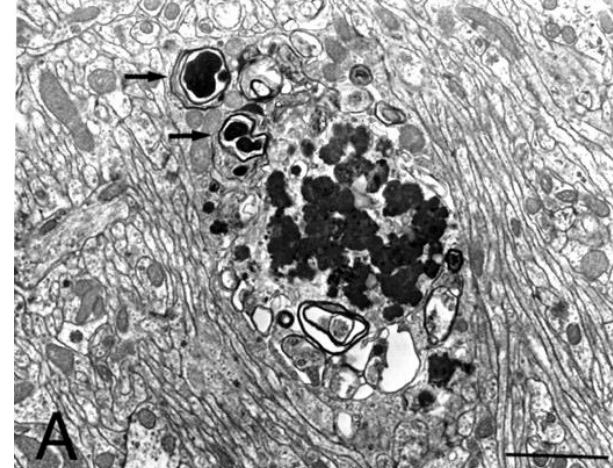
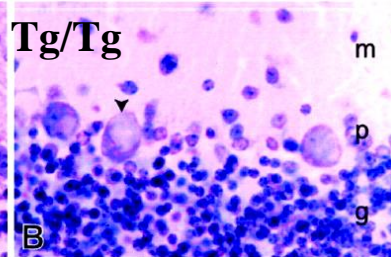
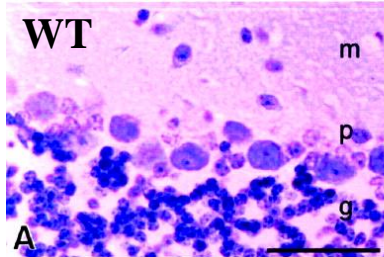
Neuroepithelial stem cells

Animal model for cerebellar atrophy (J. Neurosci. 19:2974-2986, 1999)

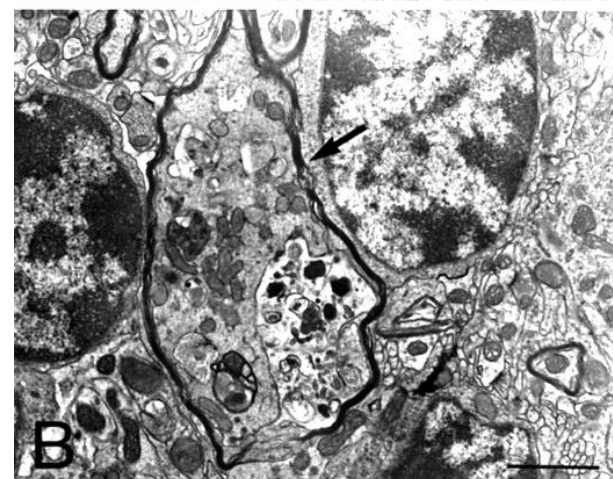
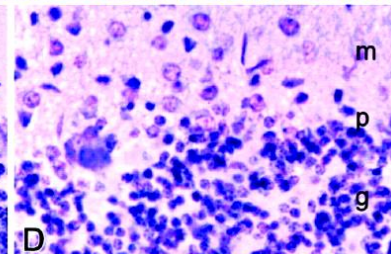
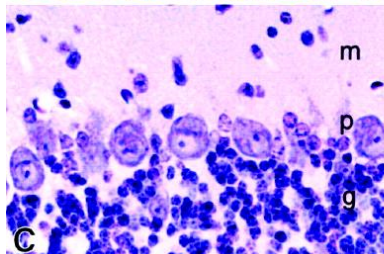




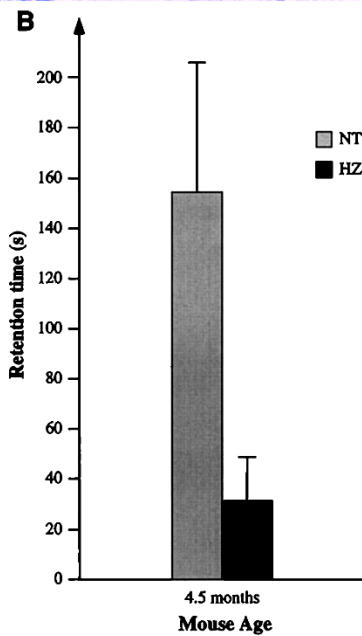
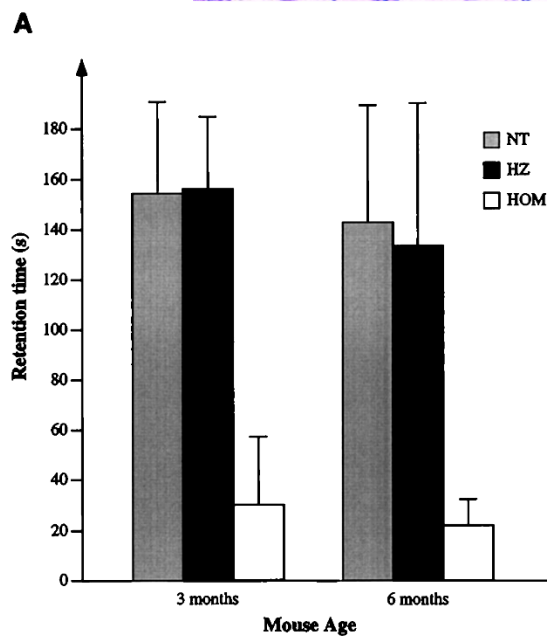
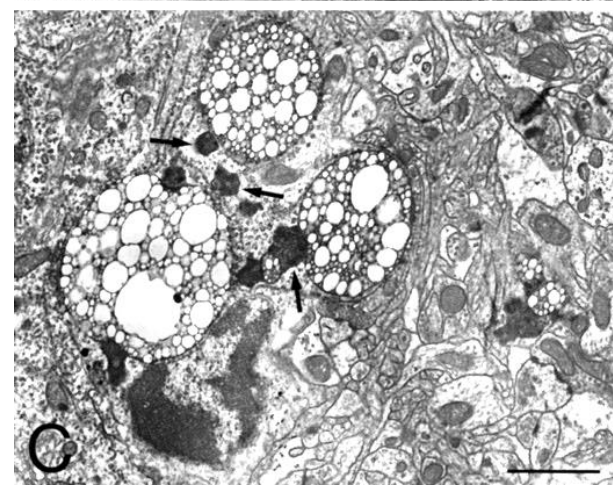
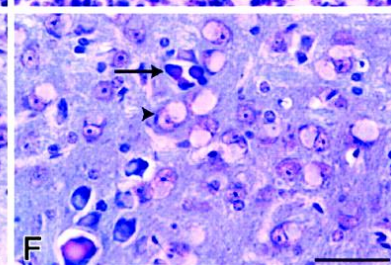
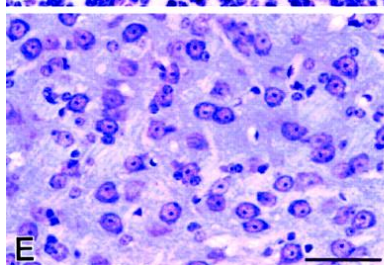
12 m
cerebella

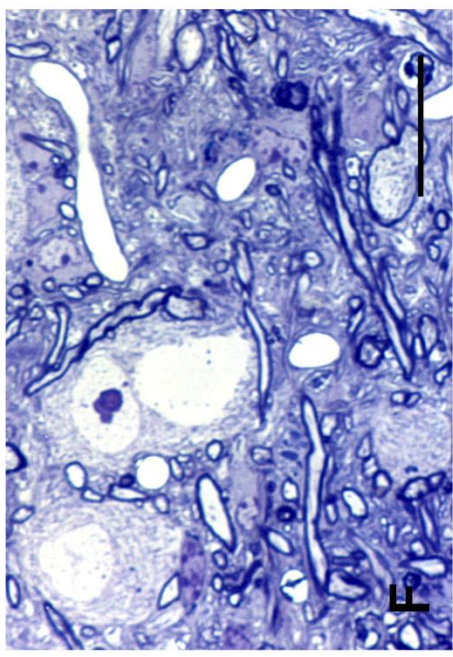
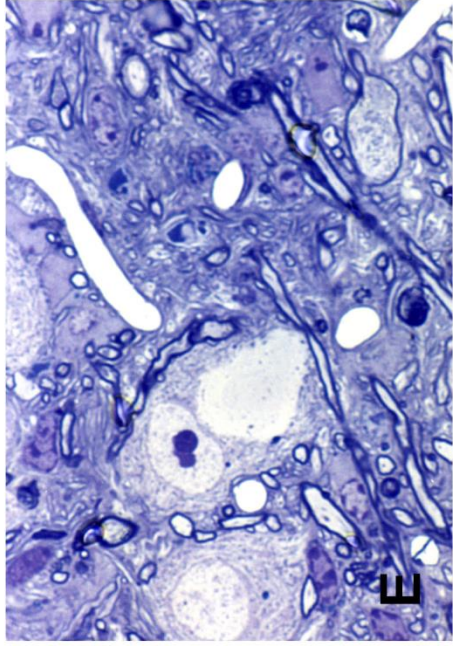
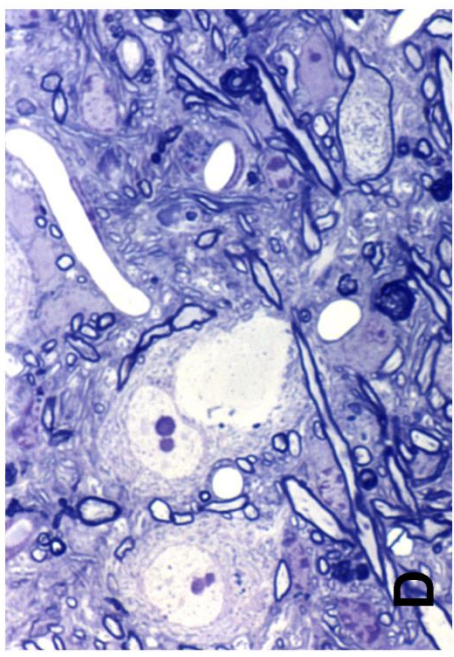
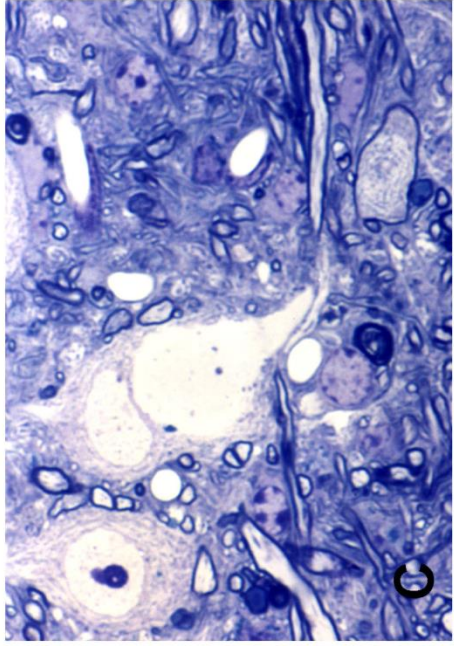
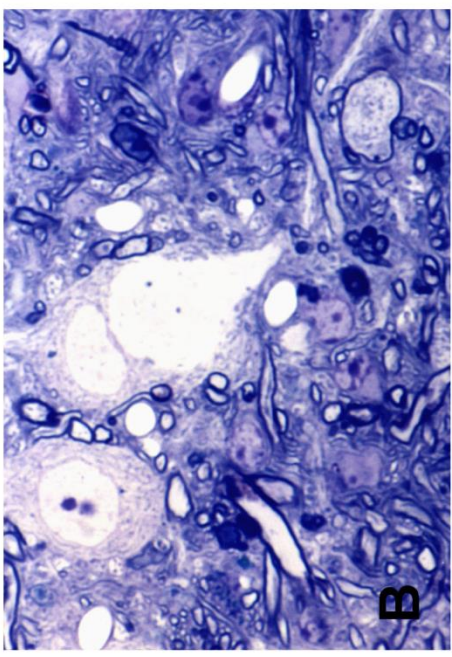
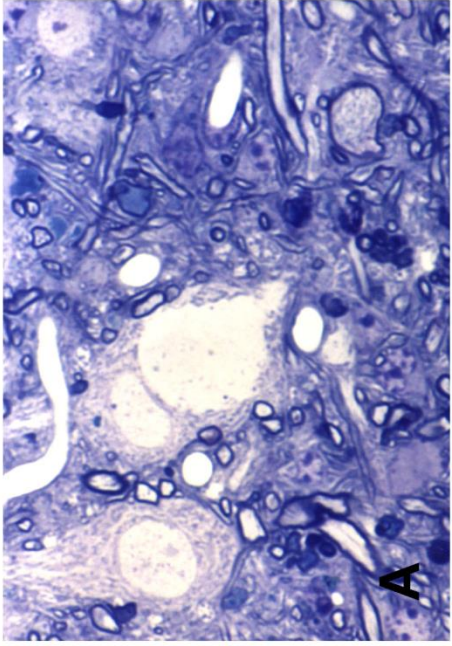


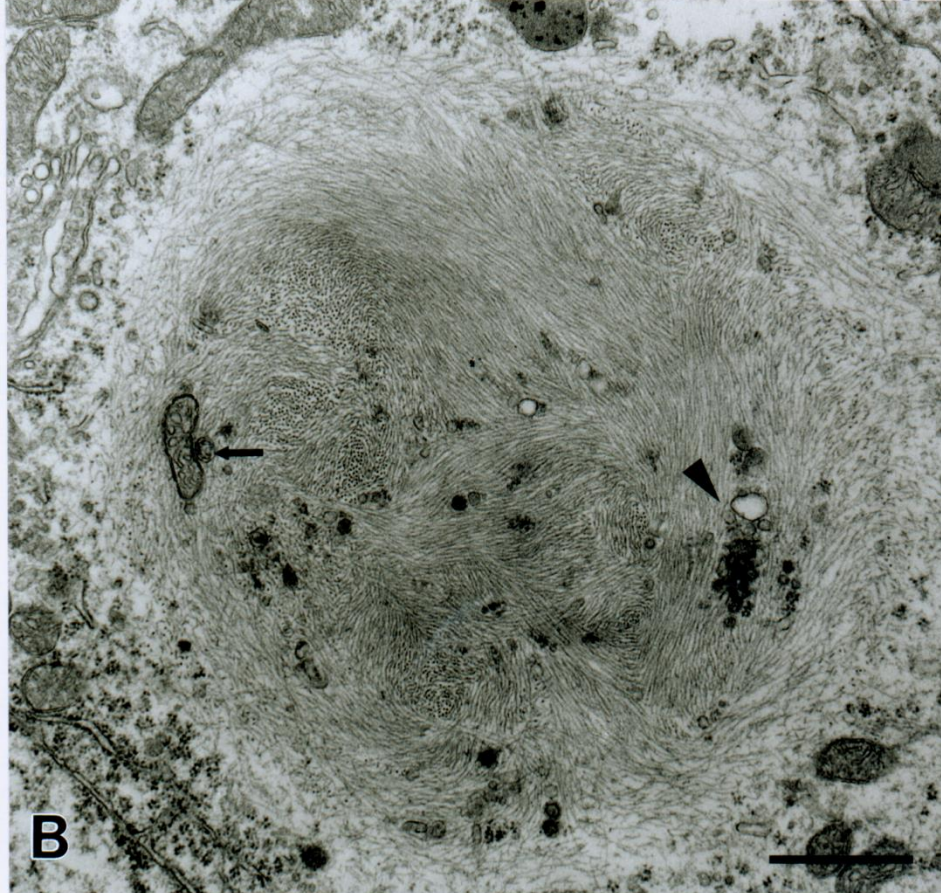
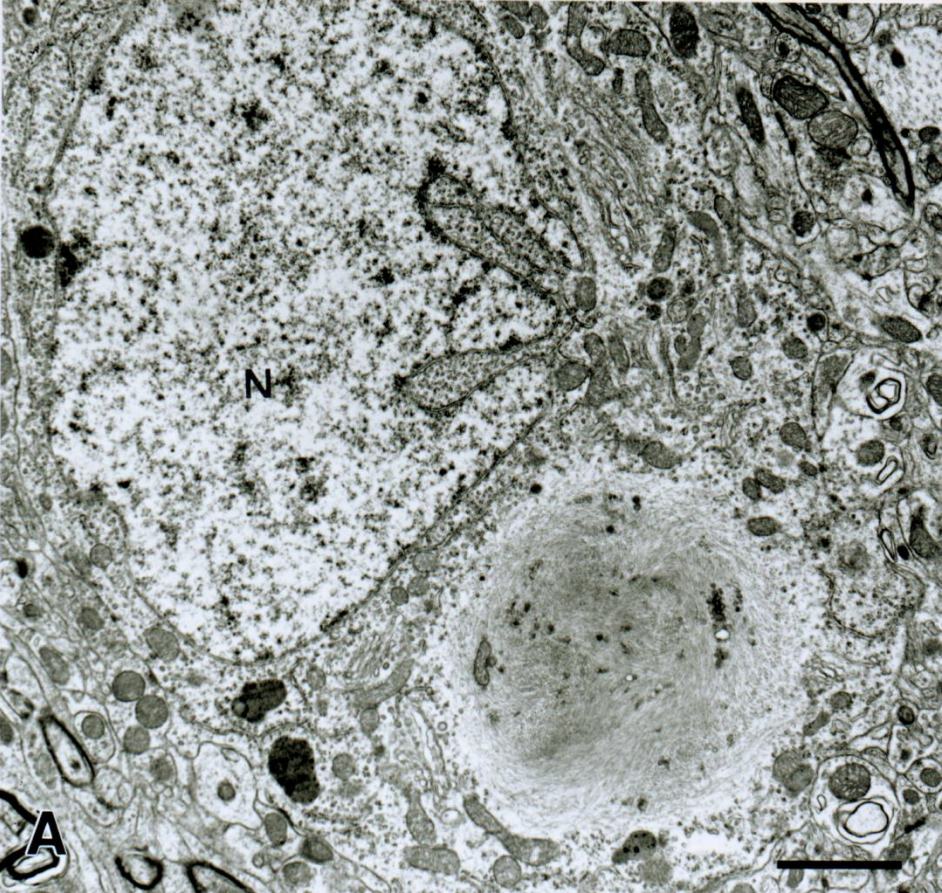
18 m
cerebella



18 m
thalamus





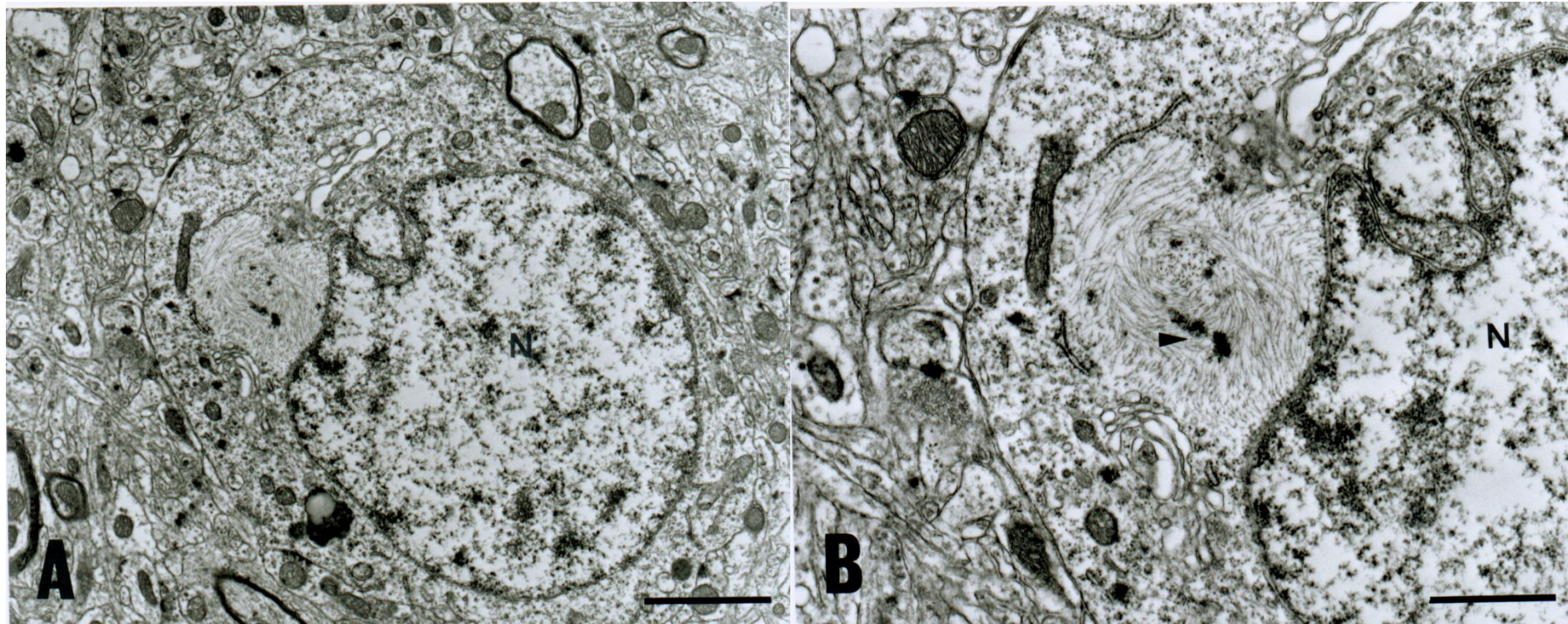


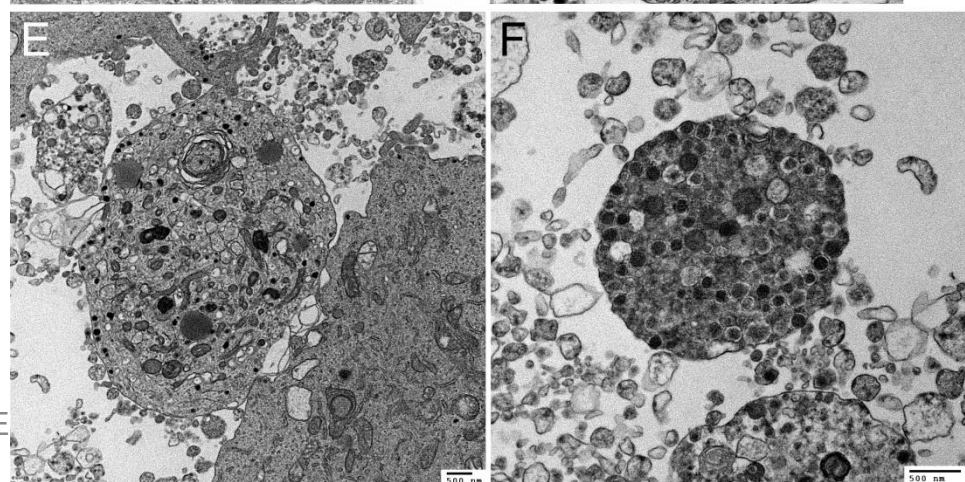
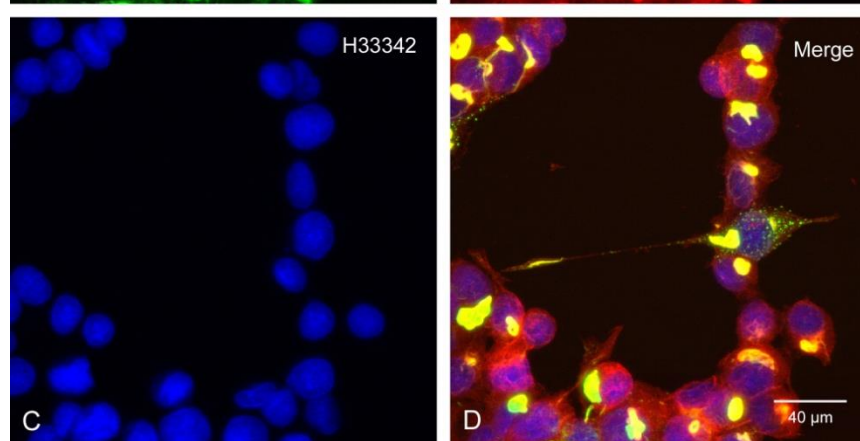
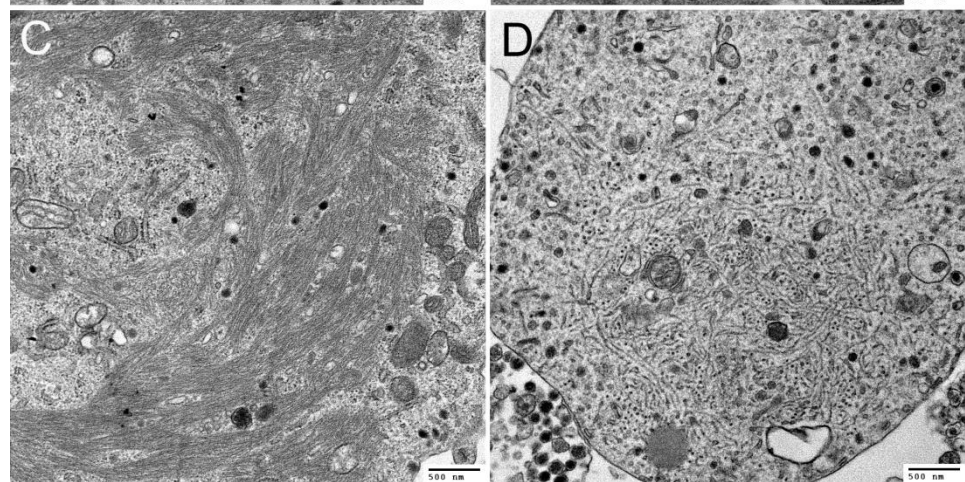
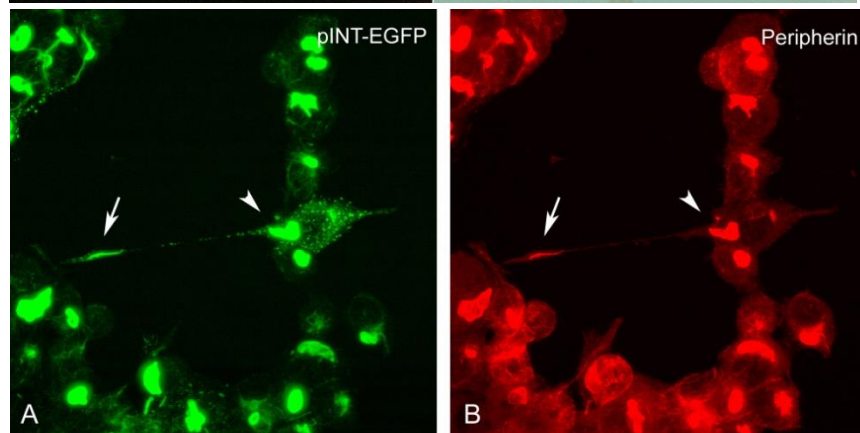
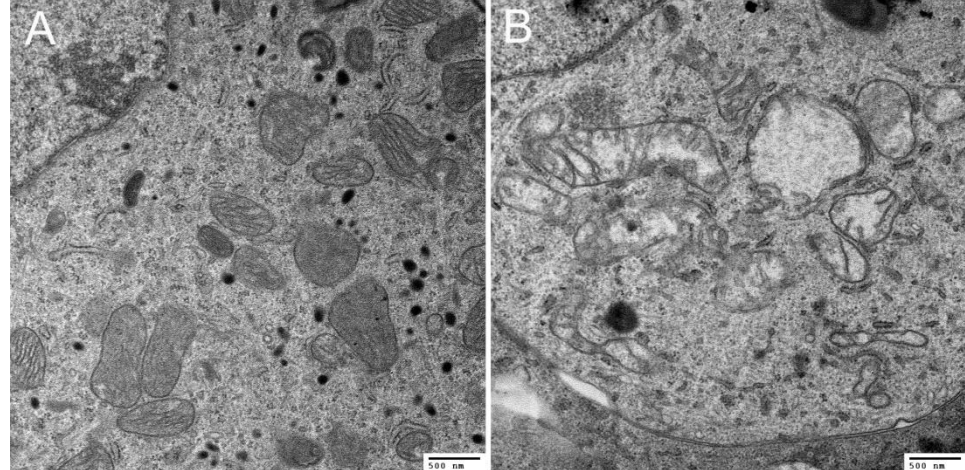
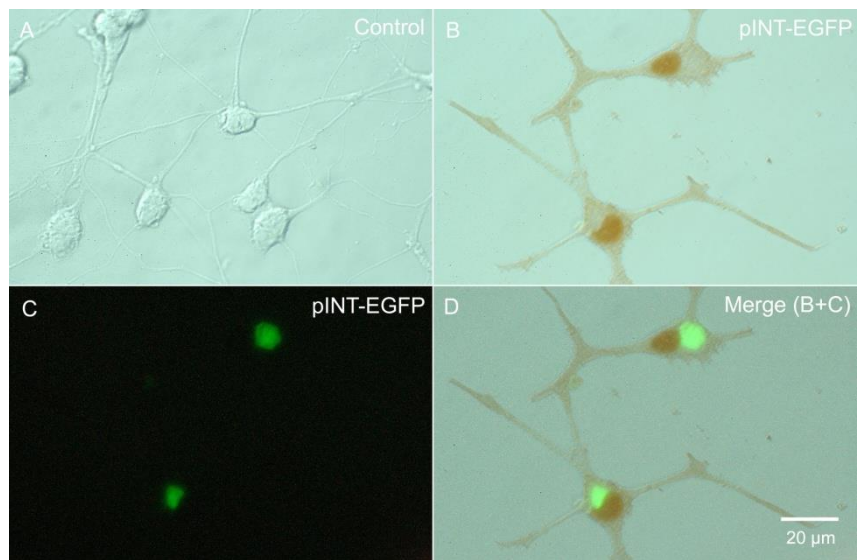
Overexpression of Neuronal Intermediate Filament Protein α -Internexin in PC12 Cells

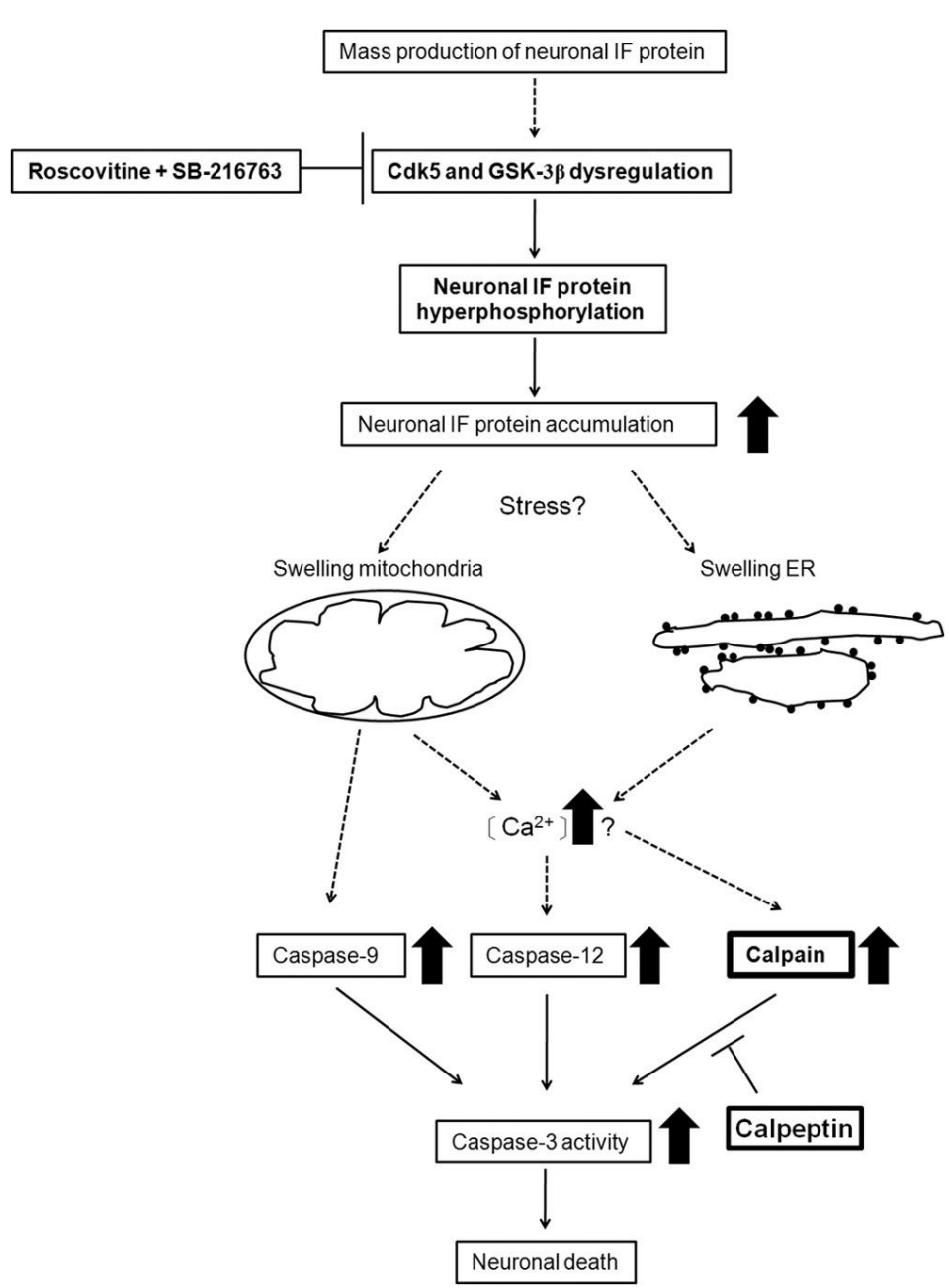
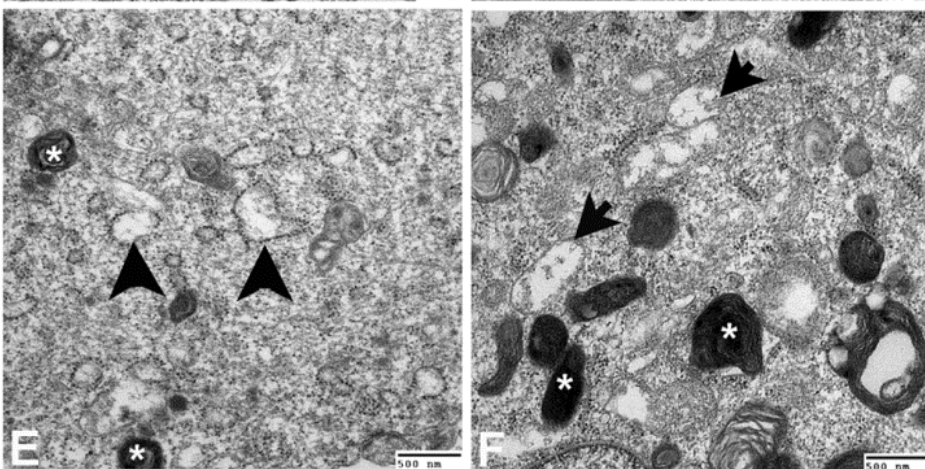
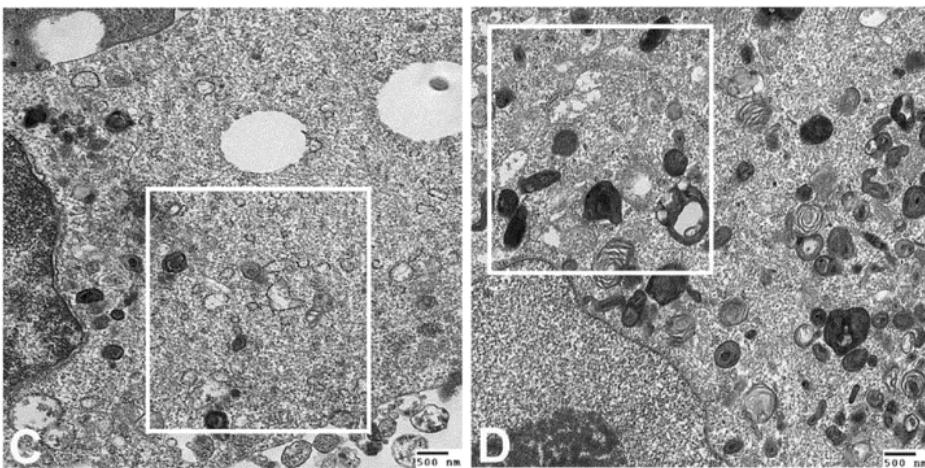
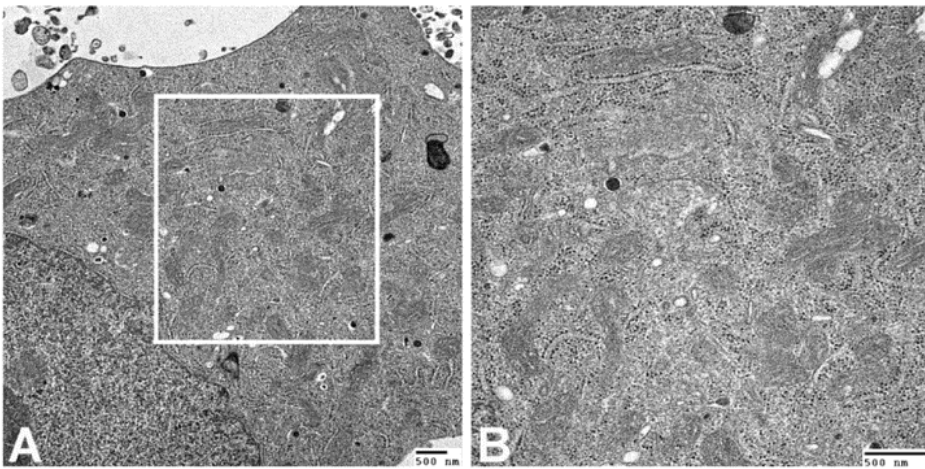
Chung-Liang Chien,^{1*} Tzu-Chiang Liu,¹ Chung-Liang Ho,² and Kuo-Shyan Lu¹

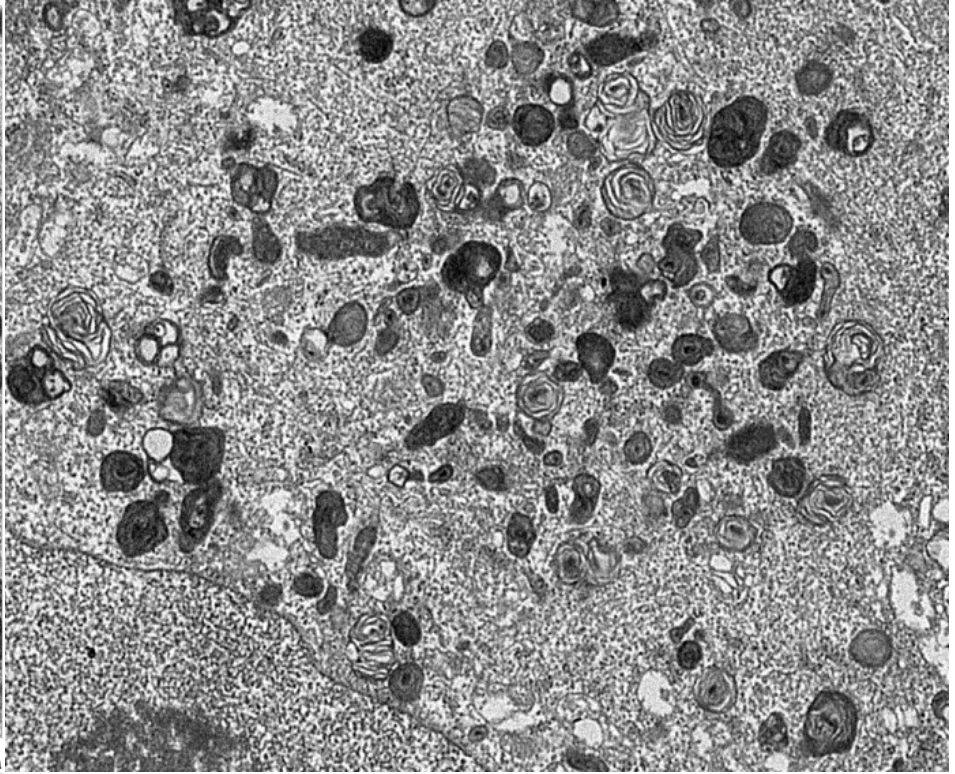
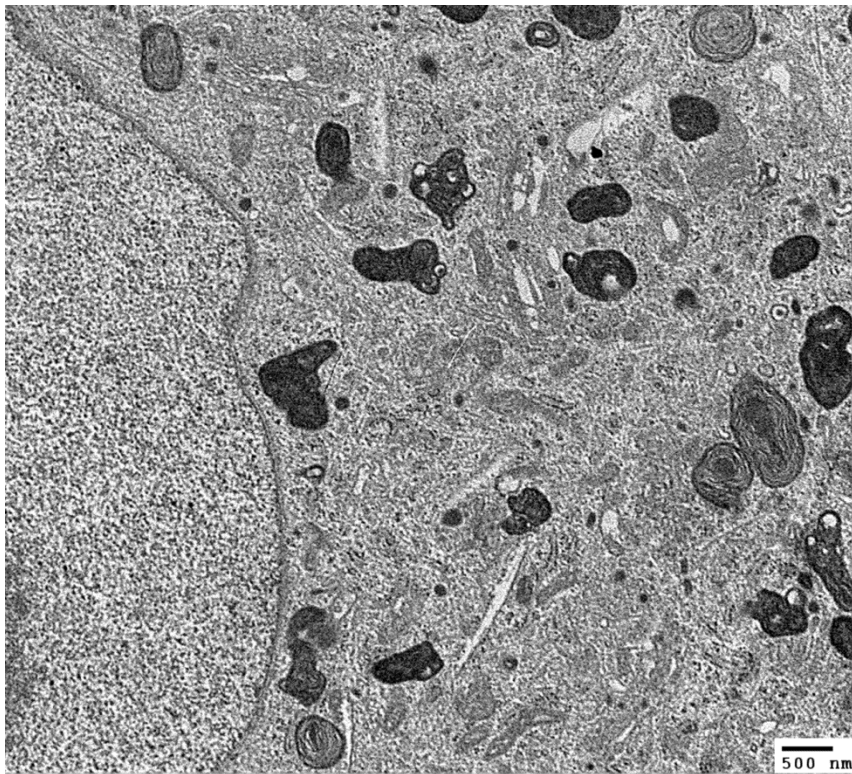
¹Department of Anatomy and Cell Biology, College of Medicine, National Taiwan University, Taipei, Taiwan

²Department of Pathology, College of Medicine, National Cheng-Kung University, Tainan, Taiwan



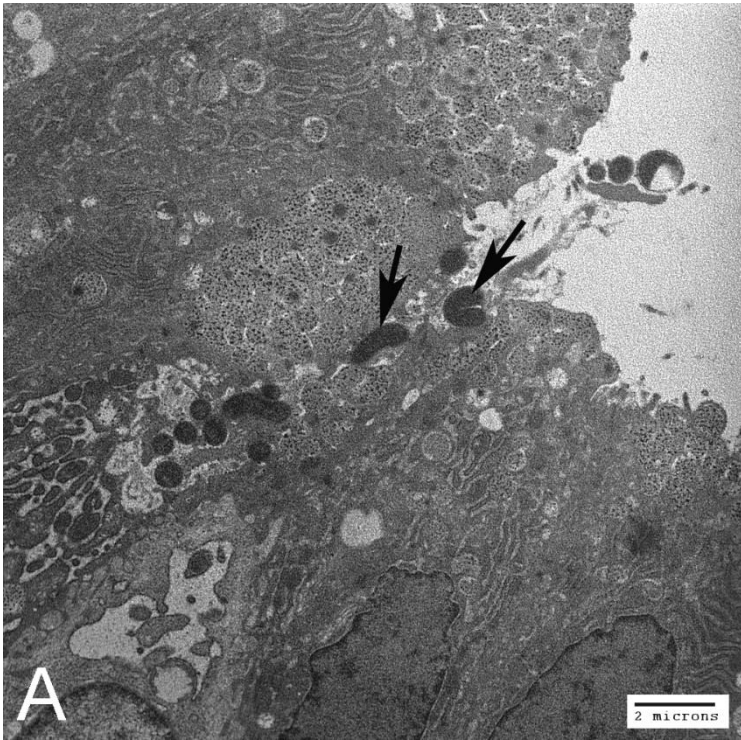
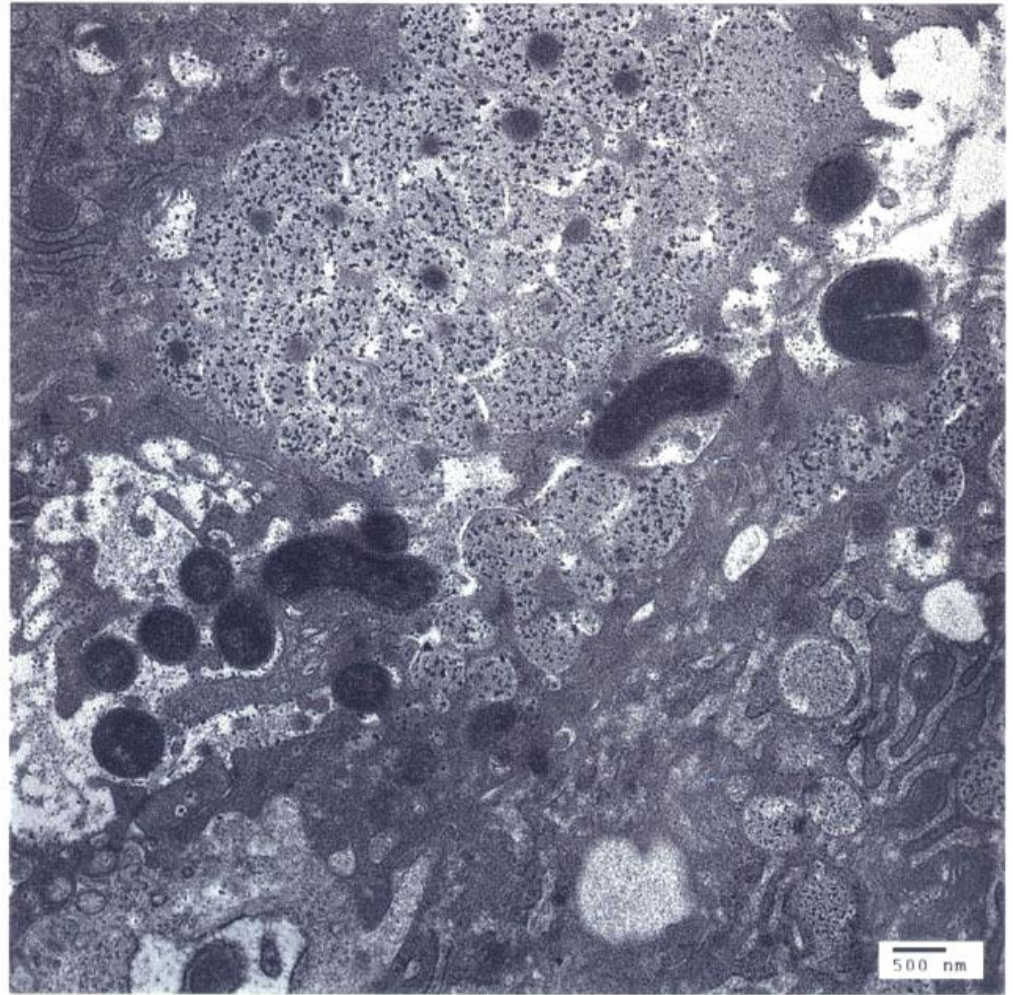
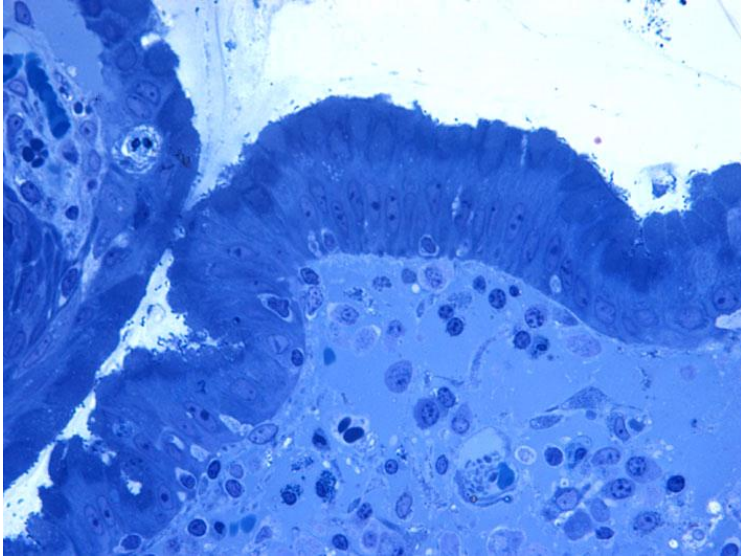






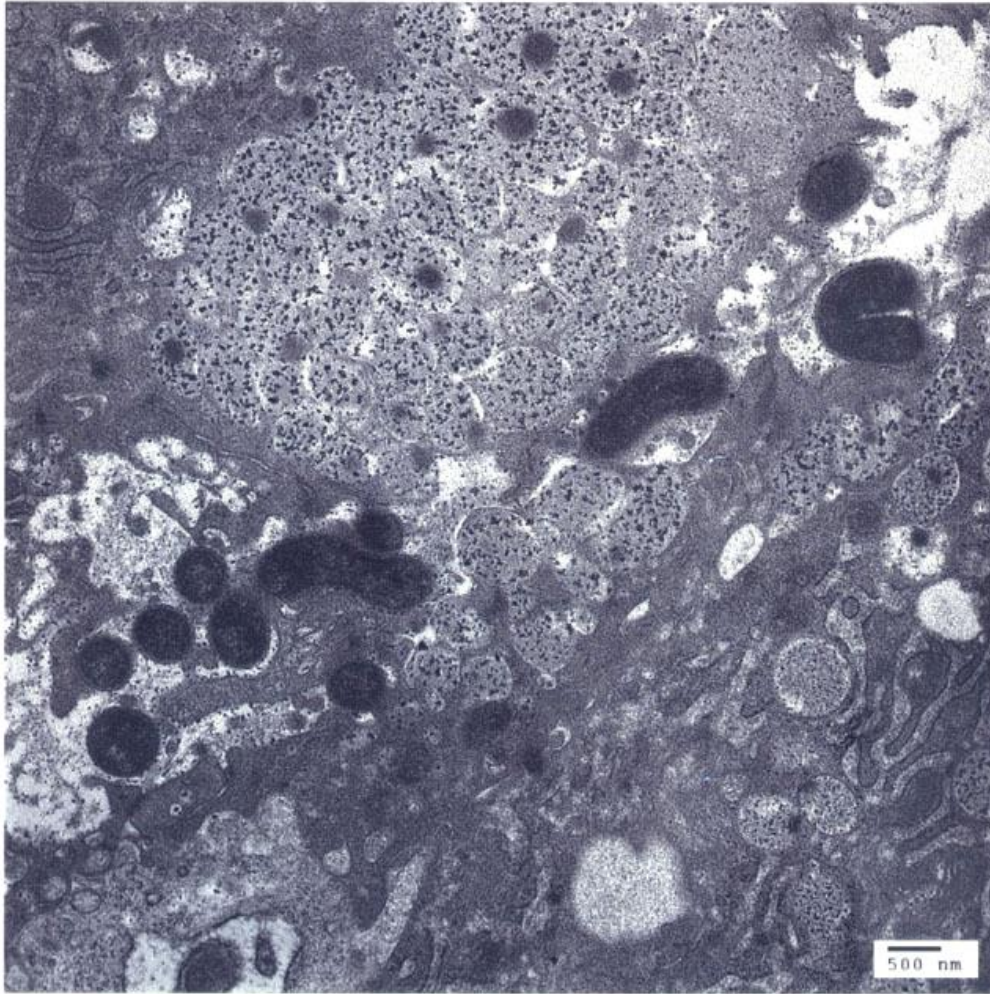
EM Sectioning (Gastric epithelia)

H. pylori between epithelial cells.



Barry Marshall Nobel Laureate

H. pylori between epithelial cells.



Barry Marshall Nobel Laureate




Dr. Barry Marshall
The 2005 in Medicine

Barry Marshall
Nobel Laureate Medicine 2005

At 112th Anniversary
Symposium
26.6.2007

Casa

THE OFFICE OF THE NOBEL LAUREATES
PERTH, WESTERN AUSTRALIA

 Professor Barry Marshall AC
MBBS, FRACP, FAA, FRS
Nobel Laureate

Phone: +61 (0) 8 9382 2686 Suite 10, 3 Conroy Avenue
Email: barrymarshall@perth.com.au Subiaco 6008
Fax: +61 (0) 8 9382 2313 Western Australia
Australia