Development of Complex Curricula for Molecular Bionics and Infobionics Programs within a consortial* framework**

Consortium leader

PETER PAZMANY CATHOLIC UNIVERSITY

Consortium members

SEMMELWEIS UNIVERSITY, DIALOG CAMPUS PUBLISHER

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**Molekuláris bionika és Infobionika Szakok tananyagának komplex fejlesztése konzorciumi keretben

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BASICS OF NEUROBIOLOGY

Neurobiológia alapjai

The cell

A sejt

ZSOLT LIPOSITS

Organism

Organ systems

Organs

Tissues

Cells

Cell organelles

Organic and inorganic compounds

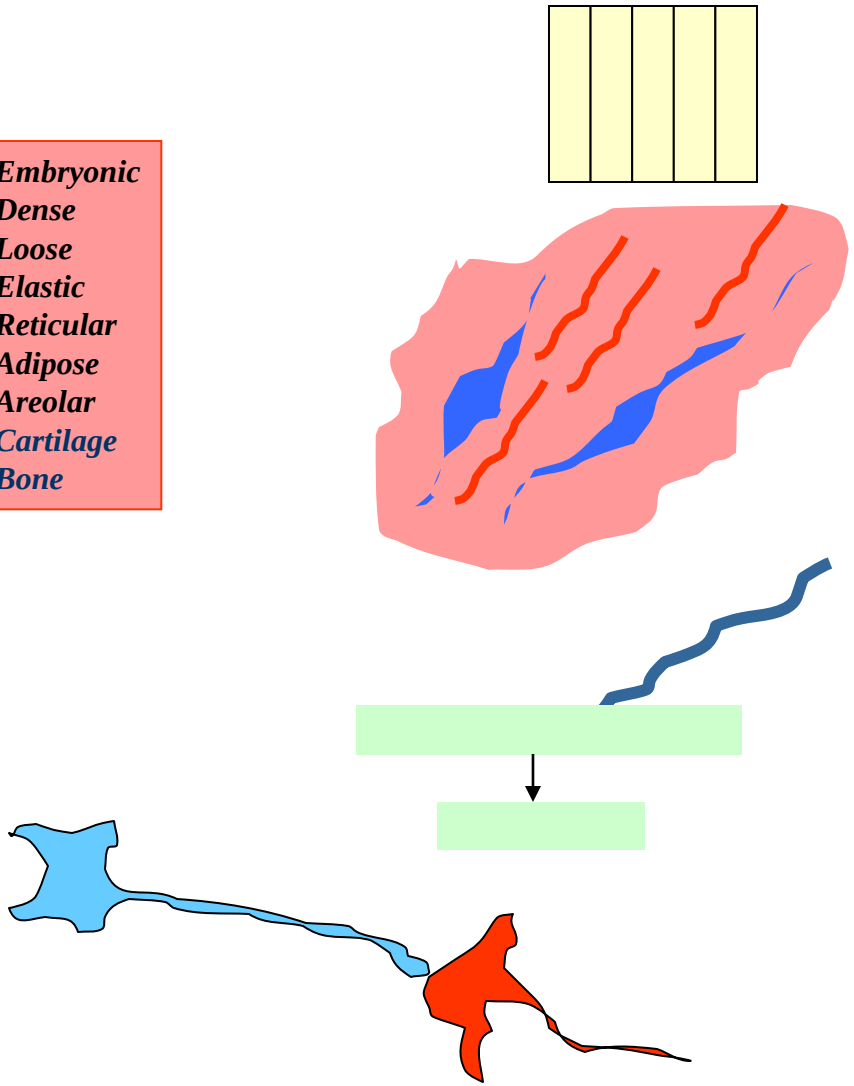
Macroscopy

Light microscopy
Electron microscopy

Molecular biology
Biochemistry
Genetics

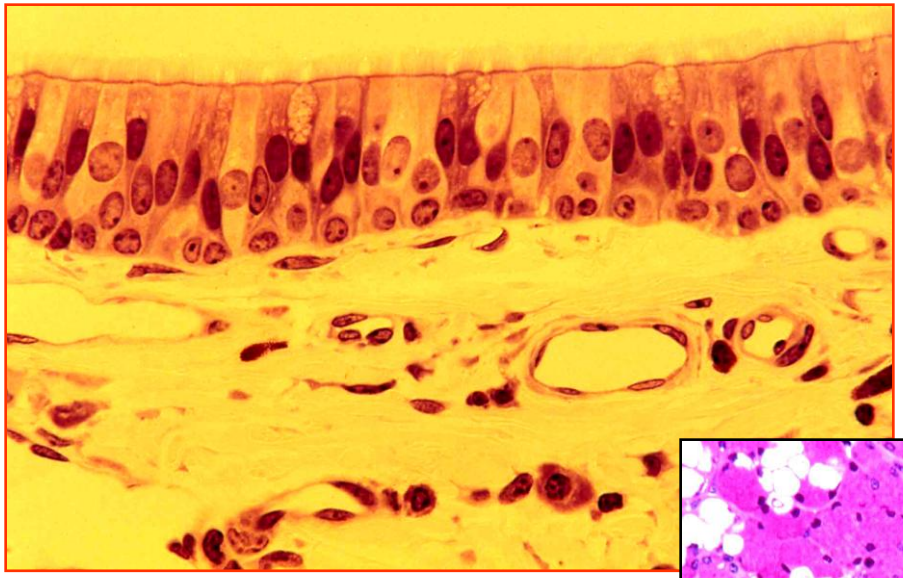
Basics of Neurobiology: The cell

- **Epithelia**
  - *Covering*
  - *Glandular*
  - *Sensory*
  - *Pigmented*
- **Connective tissues**
  - *Embryonic*
  - *Dense*
  - *Loose*
  - *Elastic*
  - *Reticular*
  - *Adipose*
  - *Areolar*
  - *Cartilage*
  - *Bone*
- **Muscle tissues**
  - *Smooth*
  - *Striated*
  - *Cardiac*
- **Nervous tissue**
  - *Neurons*
  - *Glia*

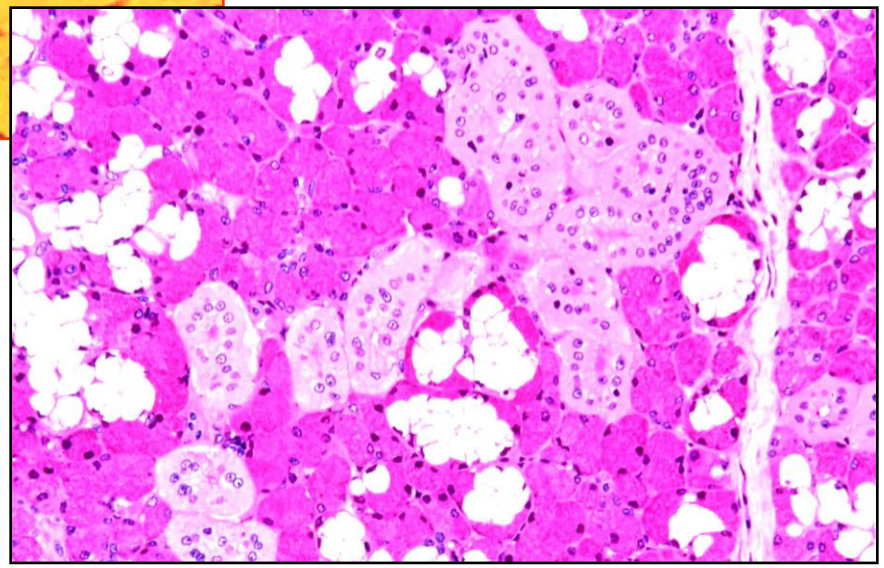


INTEGRATION OF TISSUES

MOTONEURON AXON TERMINALS- STRIATED MUSCLE FIBERS

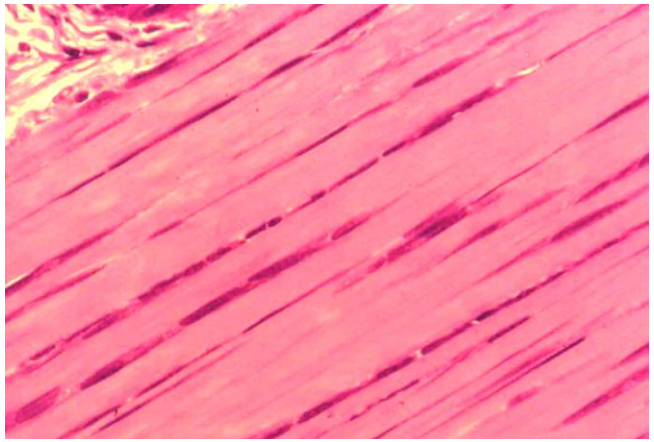


LINING EPITHELIUM

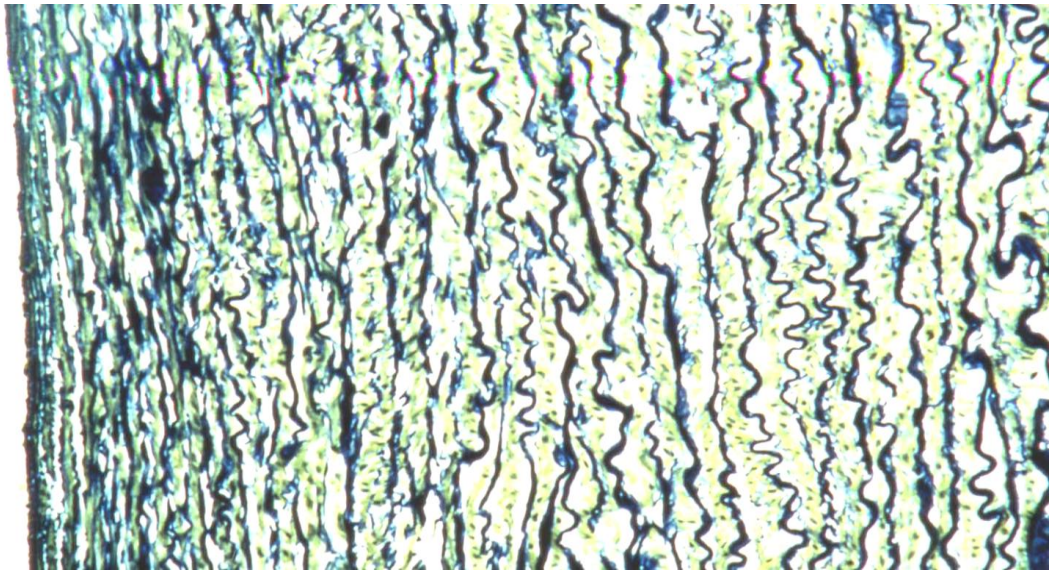


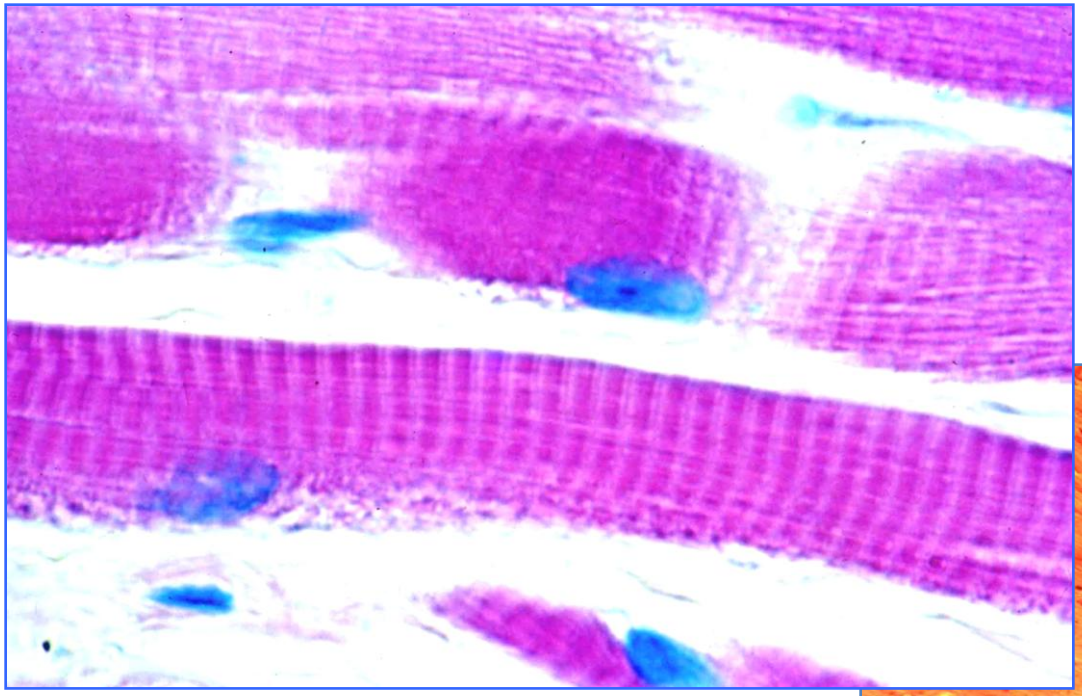
GLANDULAR EPITHELIUM

DENSE FIBROUS CONNECTIVE TISSUE (TENDON)

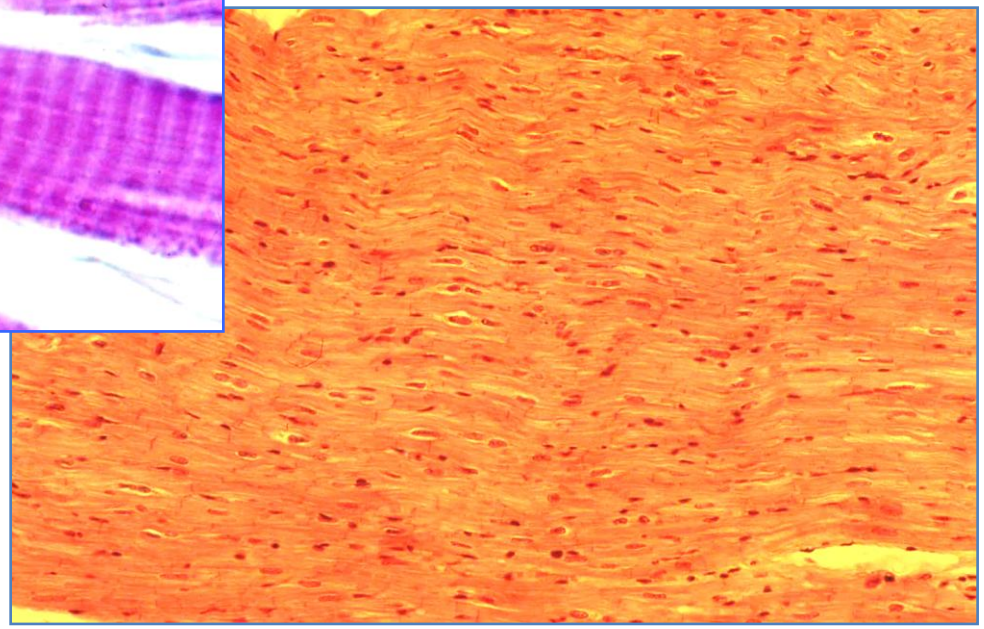


ELASTIC CONNECTIVE TISSUE



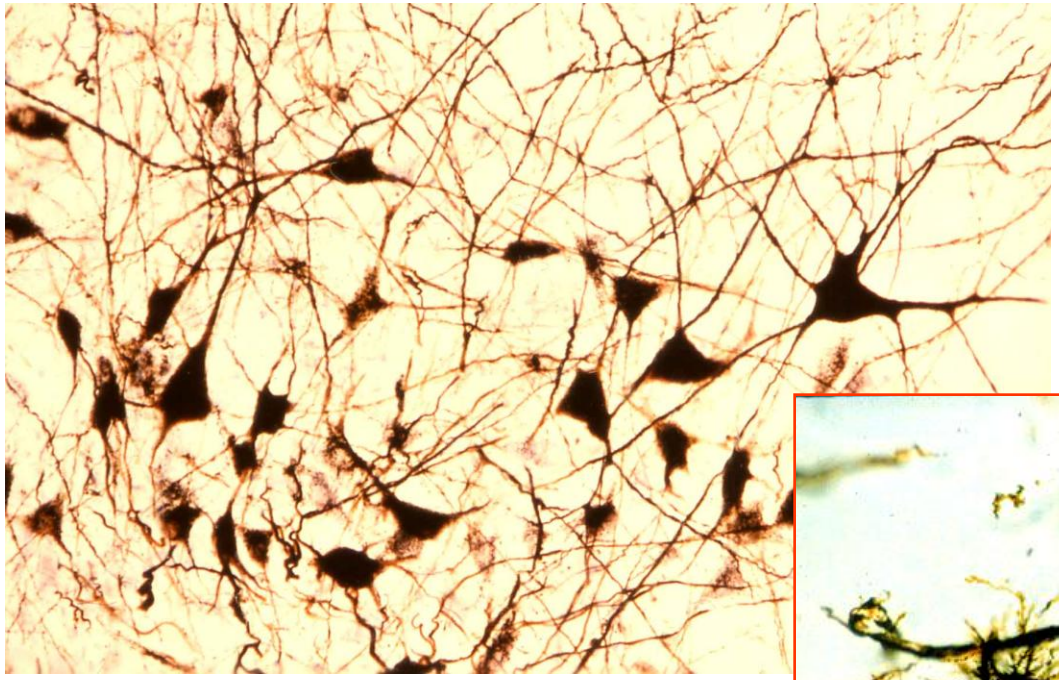


STRIATED MUSCLE



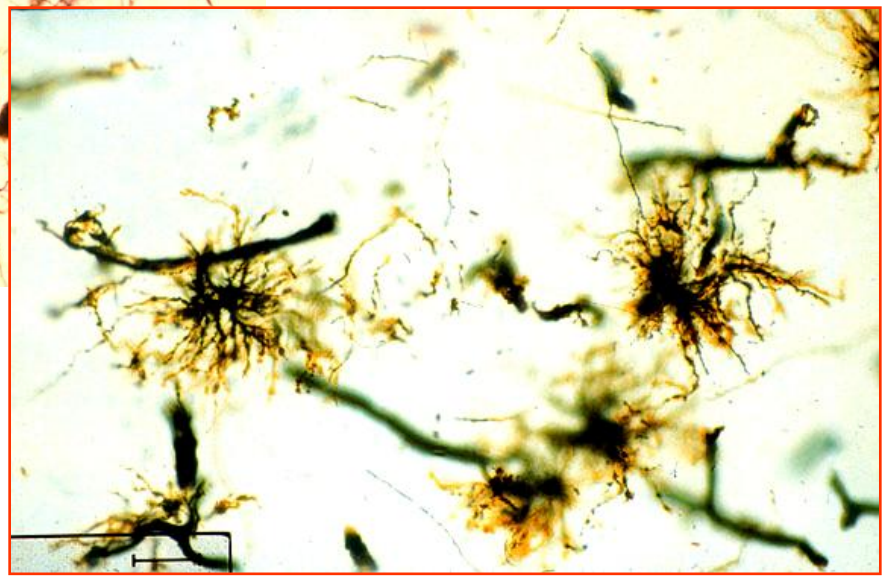
CARDIAC MUSCLE

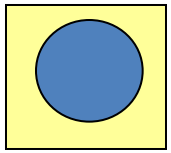
Basics of Neurobiology: The cell



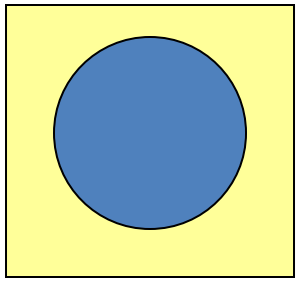
NEURON

GLIA

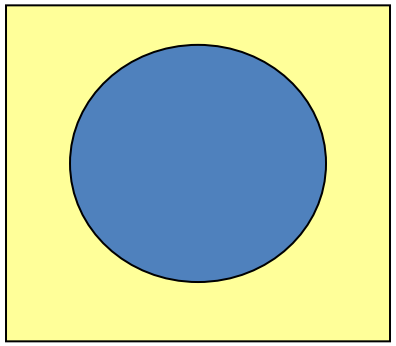




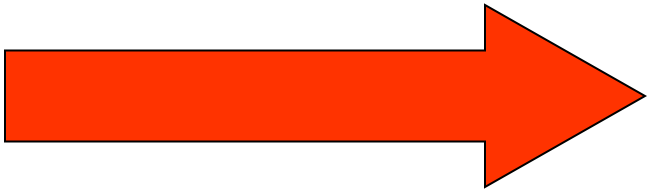
ATROPHY



NORMAL

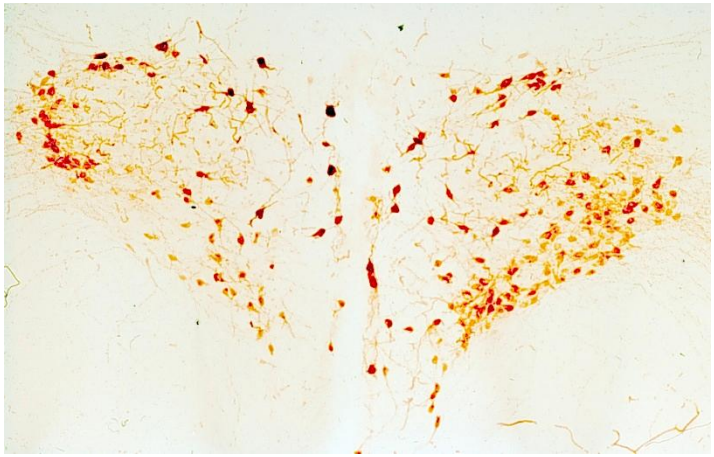


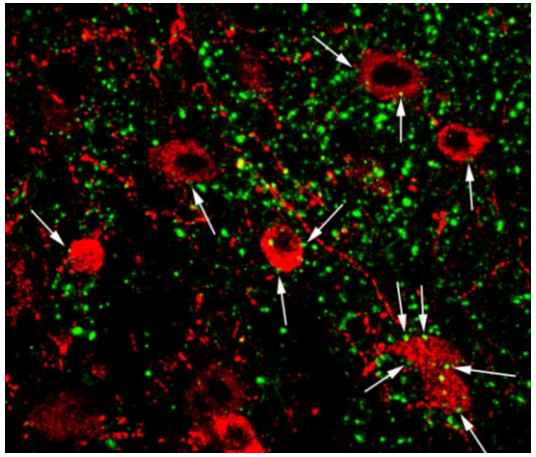
HYPERTROPHY

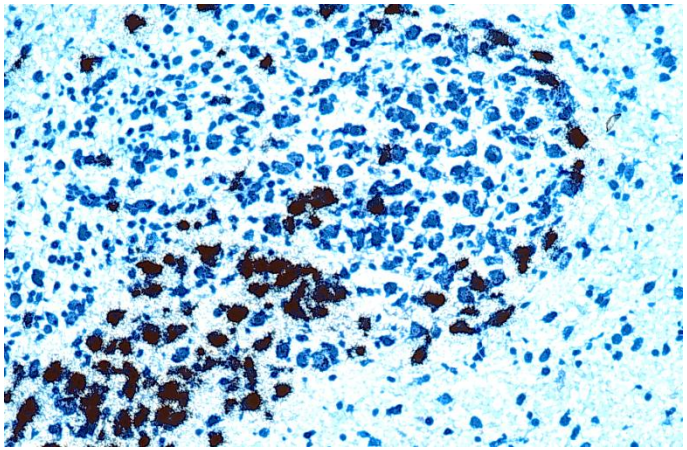


STRUCTURAL AND FUNCTIONAL PLASTICITY

IMMUNOCYTOCHEMISTRY



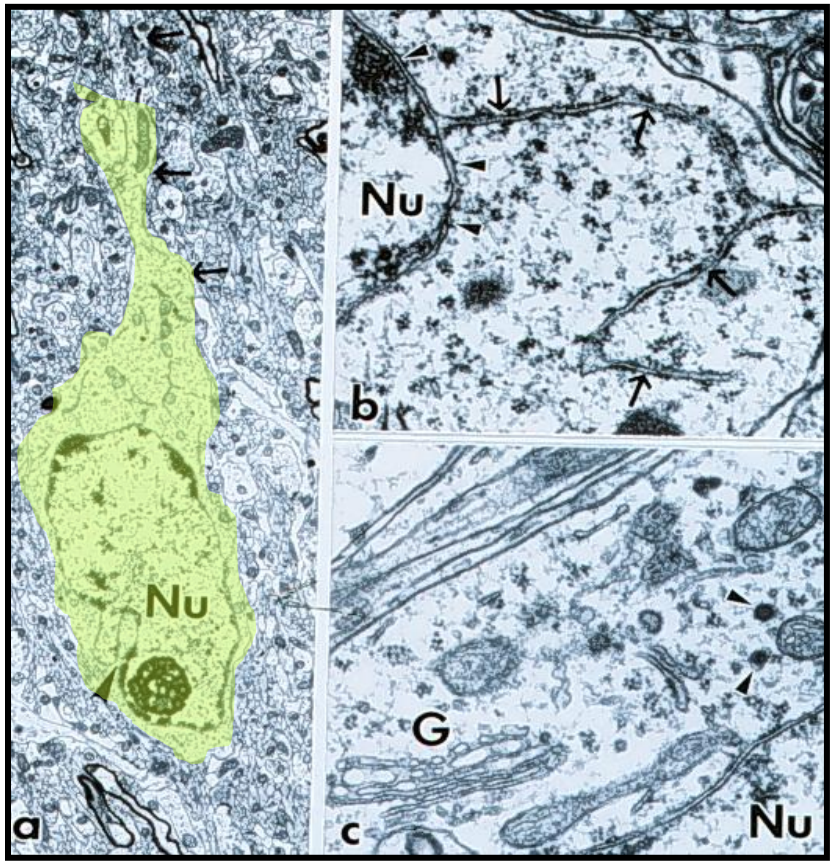


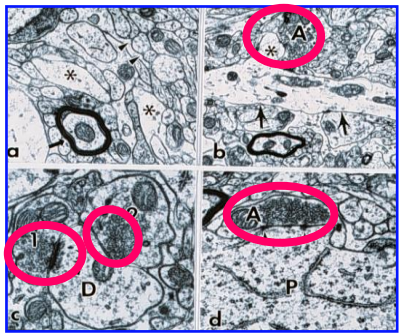


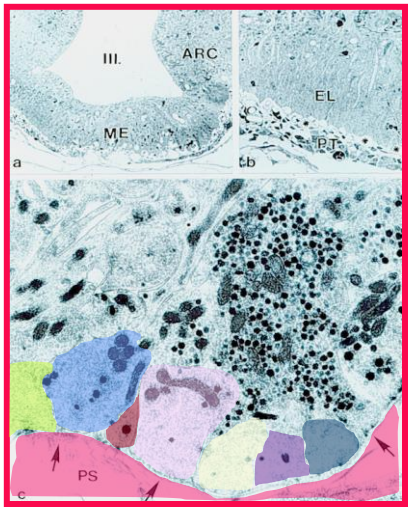
IN SITU HYBRIDIZATION HISTOCHEMISTRY

CHEMICAL NEUROANATOMY

ELECTRONMICROSCOPY. ULTRASTRUCTURE OF NEURONS







FUNCTIONAL CLASSIFACTION OF CELLS

CELL TYPE	EPITHELIAL	SUPPORT	CONTRACTILE	NERVE	GERM	BLOOD	IMMUNE	ENDOCRINE
Example	gut and blood vessel lining, covering skin	fibrous support tissue, cartilage, bone	muscle	brain	spermatozoa ova	circulating red and white cells	lymphoid tissues (nodes and spleen)	thyroid and adrenal
Function	barrier, absorption, secretion	organize and maintain body structure	movement	direct cell communication	reproduction	oxygen transport, defense	defense	indirect cell communication
Special features	tightly bound together by cell junctions	produce and interact with extracellular matrix material	filamentous proteins cause contraction	release chemical messengers onto surface or other cells	haploid chromosome set	proteins bind oxygen, proteins destroy bacteria	recognize and destroy foreign material	secrete chemical messengers