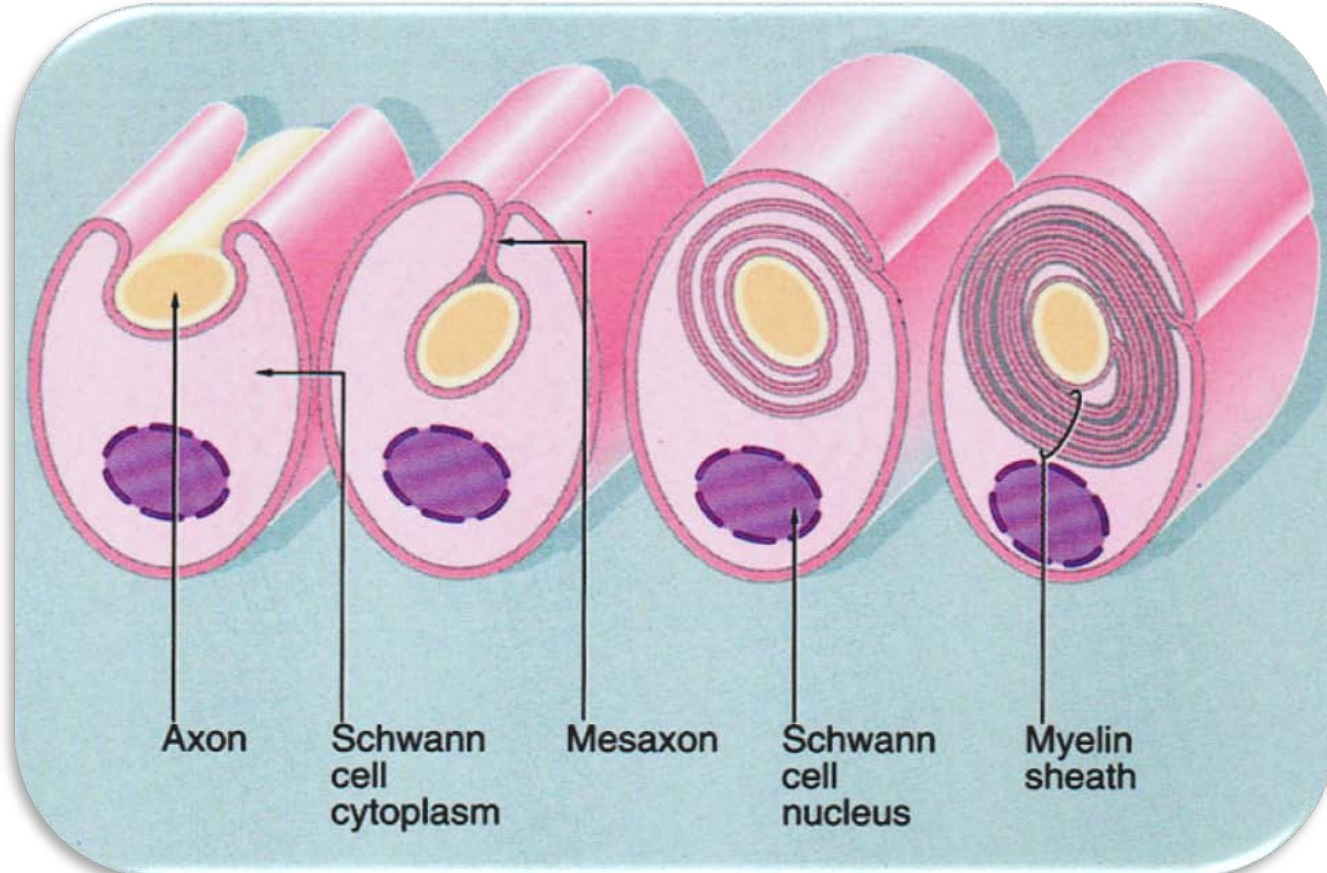


EM: myelin sheath shows a series of concentrically arranged lamellae

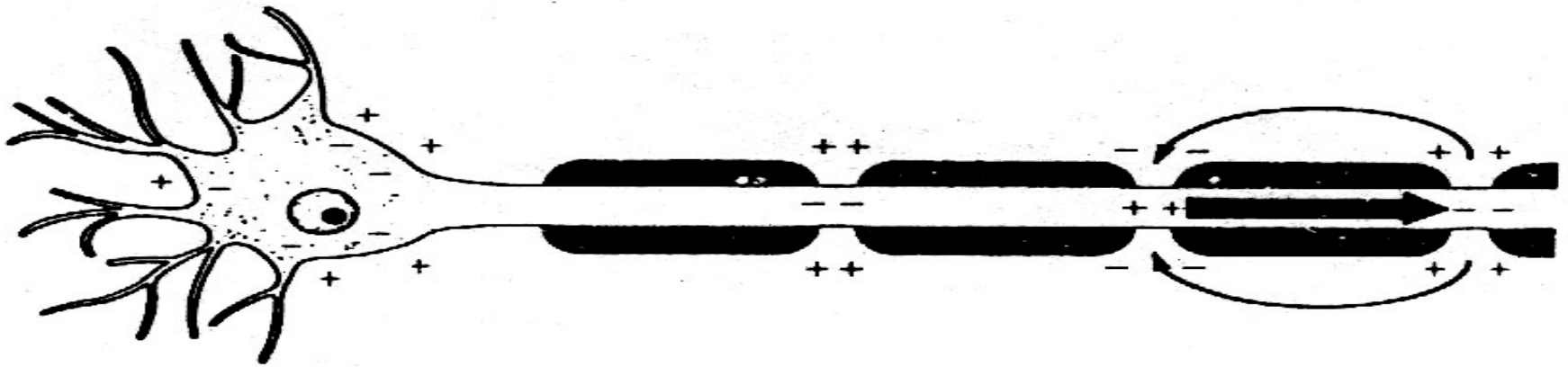
---- how to form myelin sheath?

- Schwann cell → invagination and envelop the axon → form mesaxon
→ mesaxon become longer and longer → winding around the axon
→ form myelin sheath.)



Function

conduct nerve impulses faster



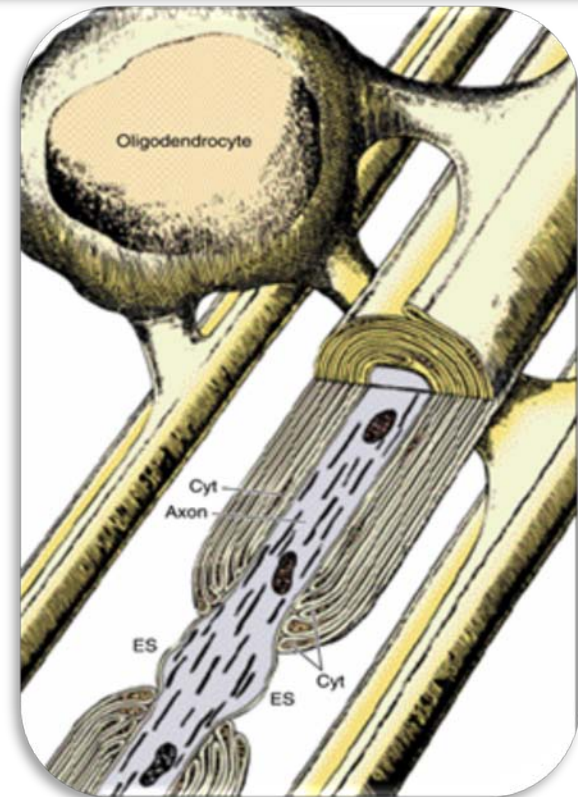
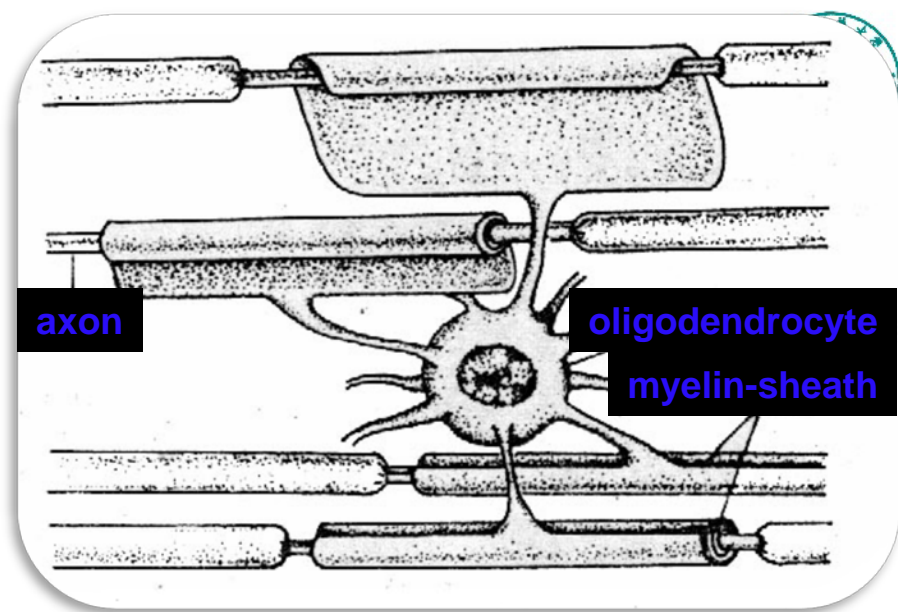
Enhancing the speed of conduction along them via salutatory conduction, i.e., impulses jumping from node to node, because myelin sheath serves as an insulator. The thicker axon has the thicker myelin sheath and longer internode, and in turn has greater conduction velocity.



Myelinated nerve fiber in CNS

---structure

- similar to in PNS
- myelin-sheath is formed by flattened ending of oligodendrocyte's processes
- one oligodendrocyte can envelop many axons

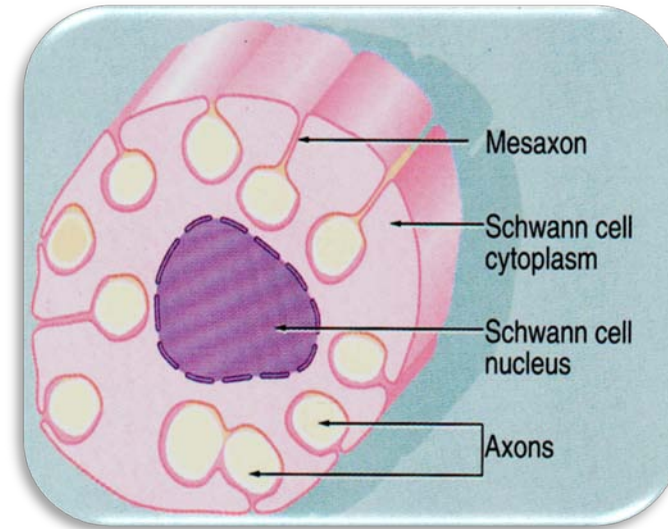


unmyelinated nerve fiber in PNS

- no myelin-sheath
- no Ranvier node

unmyelinated nerve fiber in CNS

- nothing to envelop the axon---naked axon

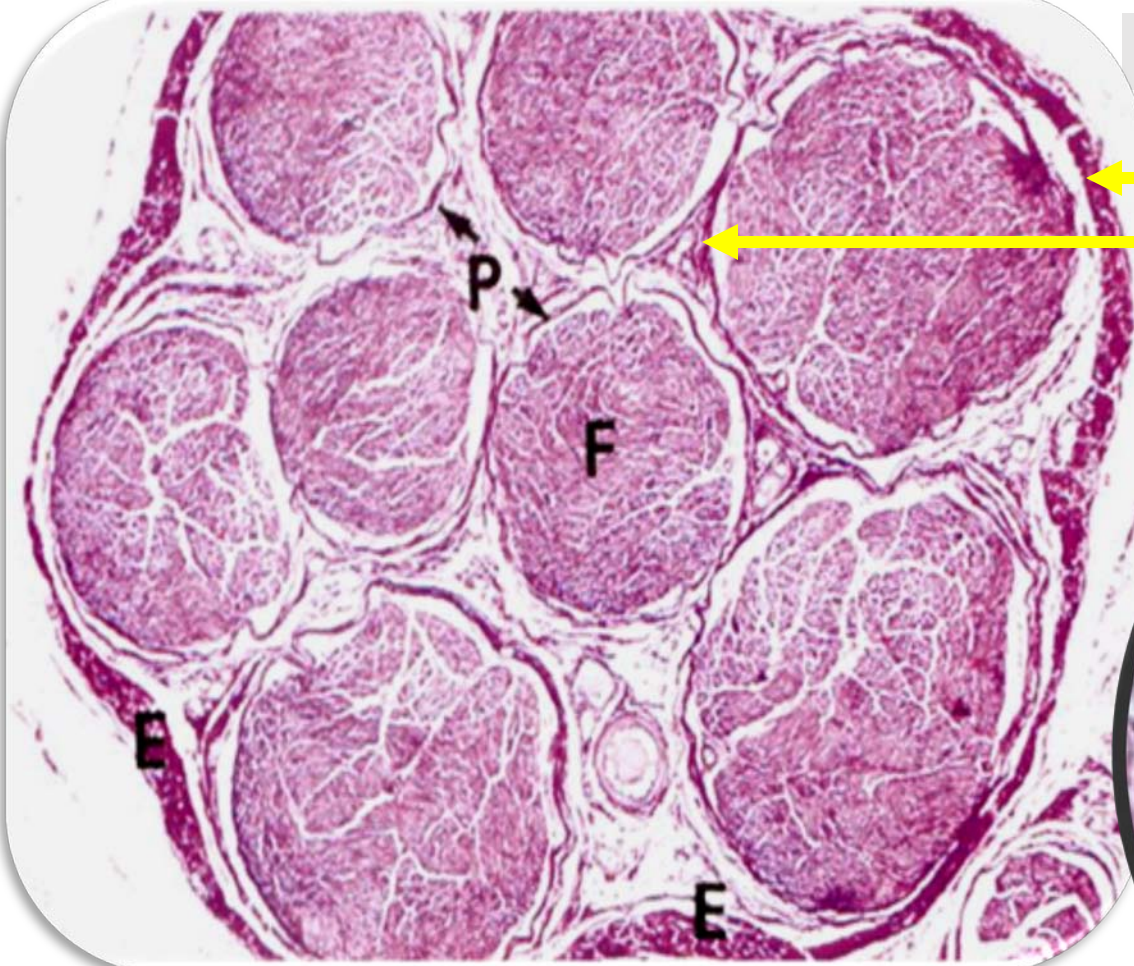




Nerves (by self-study)

- ✓ is the organ
- ✓ made up of nerve fibers and connective tissue
- ✓ most nerves are mixed
i.e., contain both sensory (afferent) and motor (efferent) nerve fibers,
and both myelinated and unmyelinated fibers.

LM: Nerves



epineurium

perineurium

endoneurium



E: epineurium a DCT encloses the entire nerve.

P: perineurium CT + a continuous sheet of flattened epithelium-like cells surrounding each nerve bundles.

En: endoneurium envelops each nerve fiber. It is a very thin layer of LCT.



6. Nerve endings

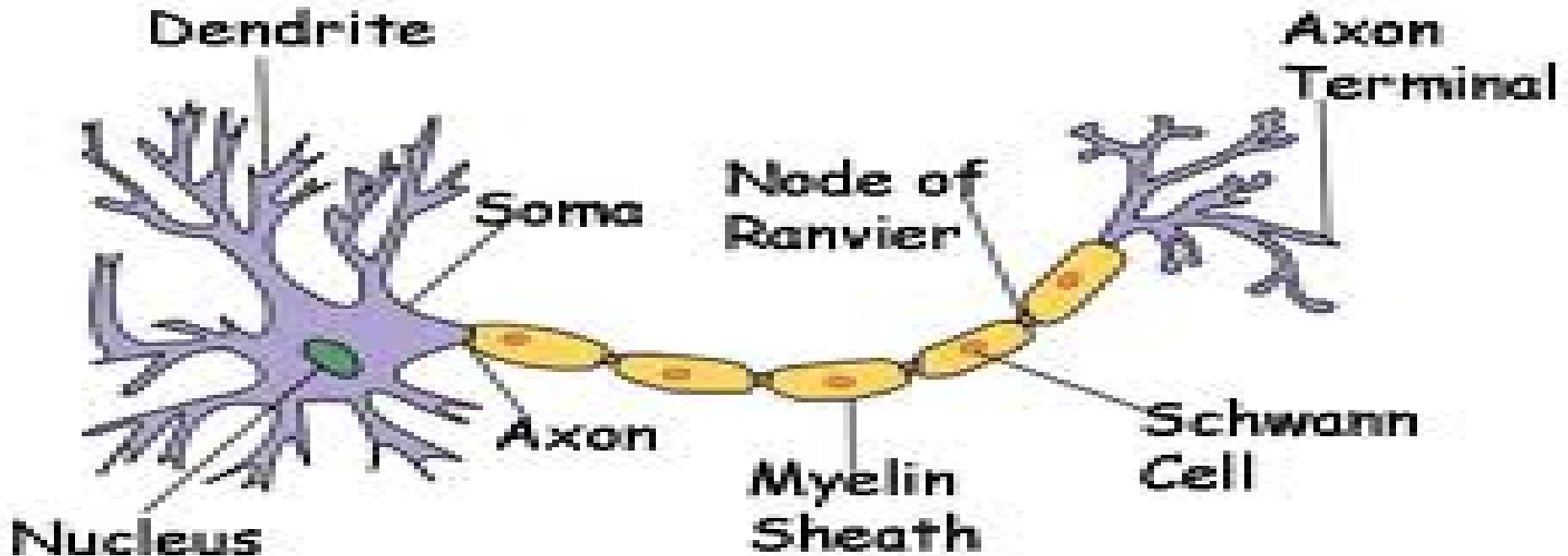
(1) Definition

(2) Classification

(3) Sensory nerve ending ★

(4) Motor nerve ending

(1) Definition: The end of peripheral nerve fibers is known as the nerve endings





(2) classification

sensory nerve ending



- 1.free nerve ending**
- 2.tactile corpuscle**
- 3.lamellar corpuscle**
- 4.muscle spindle**

motor nerve ending



- 1.motor end plate**
- 2.visceral motor
nerve ending**



(3) Sensory nerve ending

① Free nerve ending

---structure

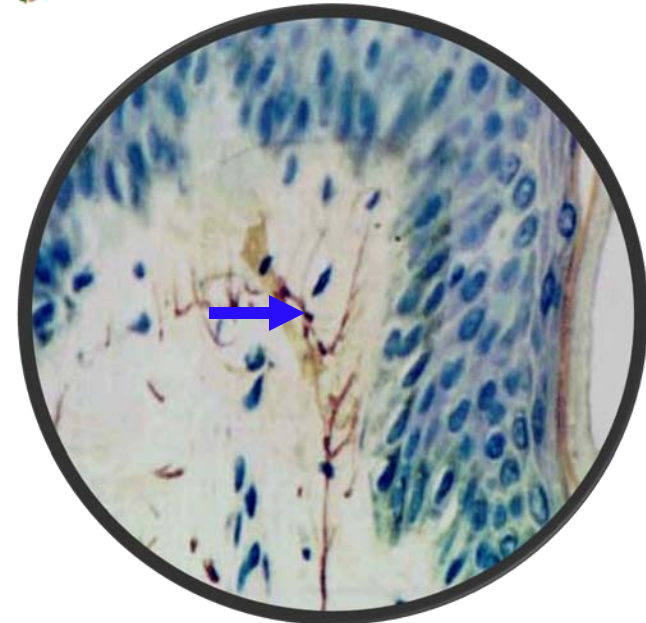
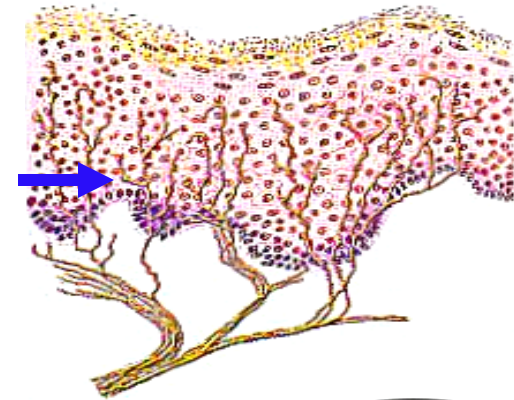
NF → lose myelin-sheath
→ branch

---distribution

epidermis, cornea,
oral cavity.....

---function

feel cold, hot, pain and
slight touch



② Tactile corpuscle

---structure

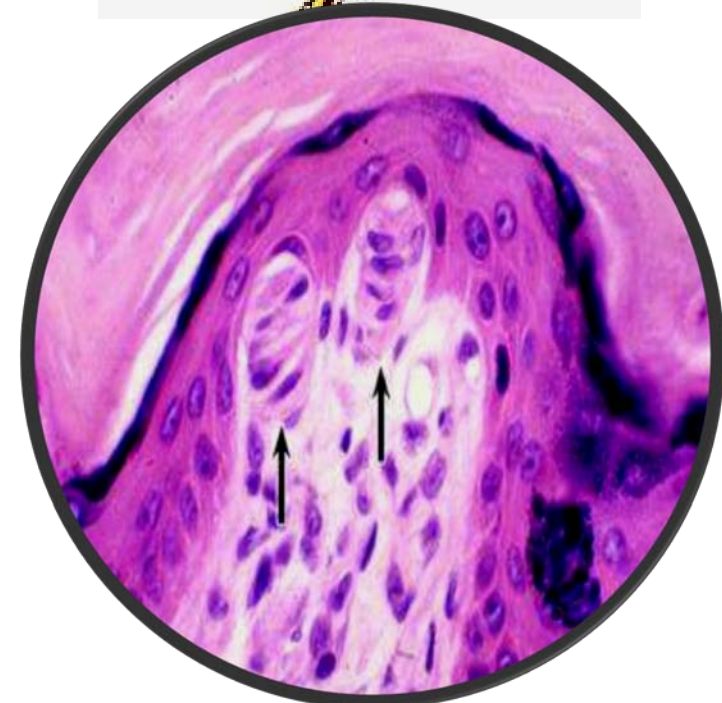
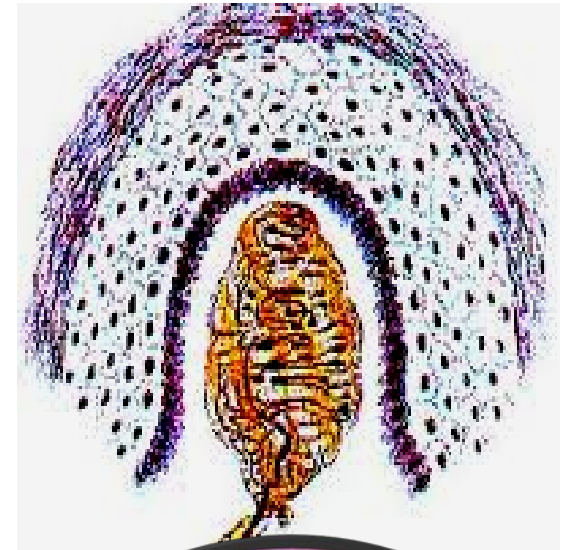
- ✓ CT capsule
- ✓ oval--shaped
- ✓ flattened cell-transverse arranged
- ✓ NF→lost myelin sheath→spiral flattened cells

---distribution

dermal papillae, especially in tips of finger, palms and lips

---function

touch receptors



③ lamellar corpuscle (Paciniian)

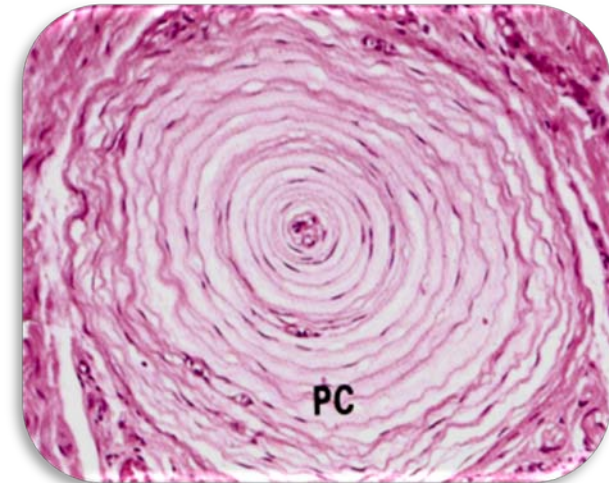
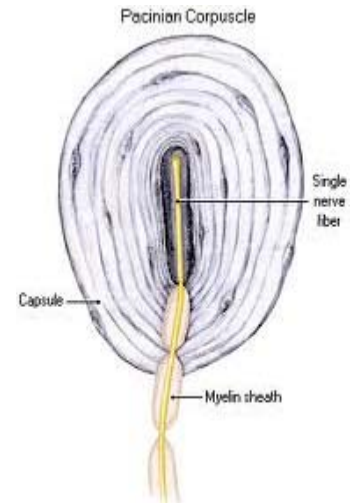
---structure

- CT capsule
- round or oval--shaped
- composed of concentric lamellae of flattened cells and internal cylinder with the naked axon inserted in it

---distribution
in subcutaneous tissue ,
mesentery

---function

feel deep or heavy pressure



④ Muscular spindle

---structure

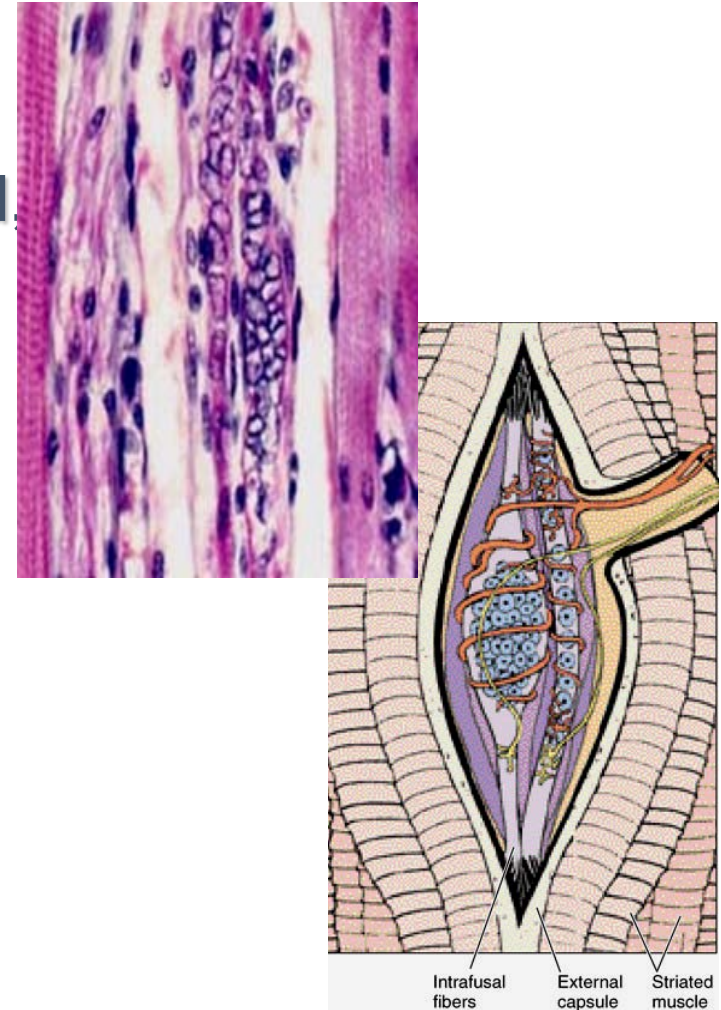
- enclosed by CT capsule,
- fusiform-shaped
- intrafusal muscle fibers (thin, striated, nuclei arranged in chain or cluster).
- nerve fibers endings around the intrafusal fibers.

---distribution

skeletal muscle

---function

stretch receptors



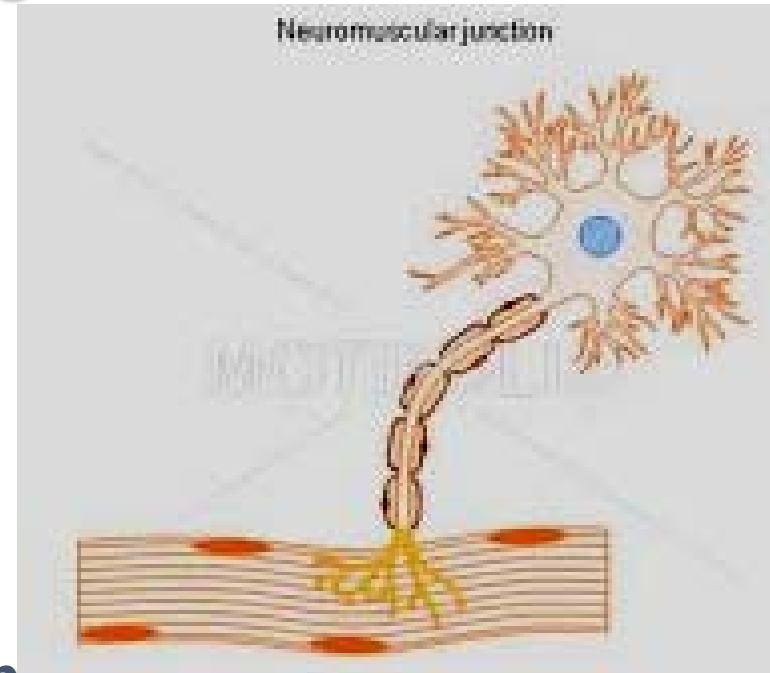


(4) Motor nerve ending

① somatic motor nerve ending (motor end plate) (neuromuscular junction)

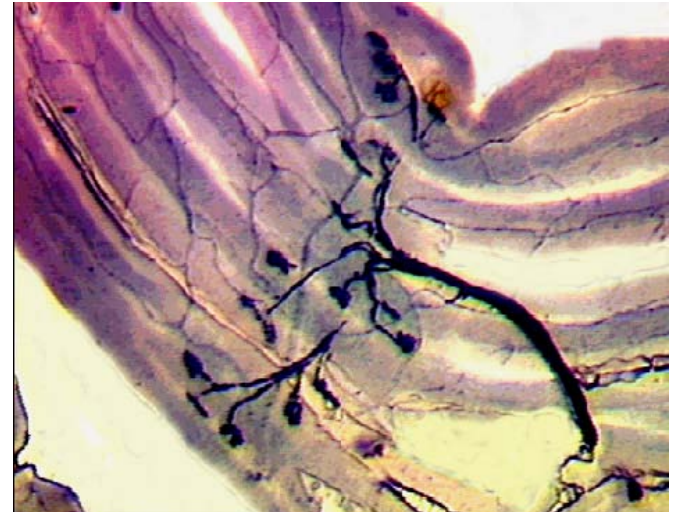
---distribution:

- skeletal muscle
- motor unit: axon of one neuron and all skeletal muscle fiber controlled by it



---structure

- **LM:** nerve fibers ramify with each terminal dilating as a plate-like mass and touching a muscle fiber



LM: motor end plate

EM: chemical synapse

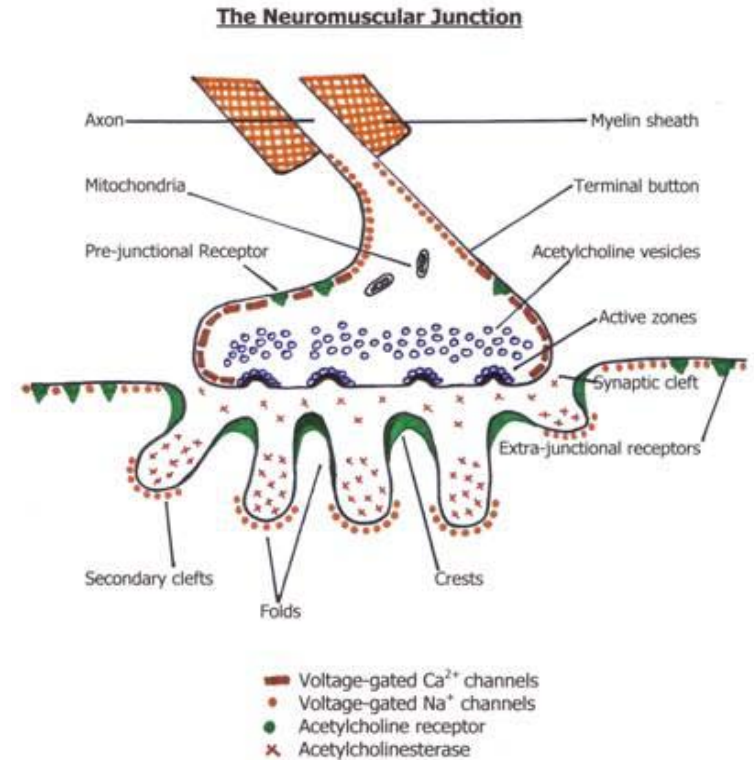
Presynaptic element

- presynaptic membrane
- synapse vesicle (acetylcholine)
- mitochondria

Synaptic cleft

Postsynaptic element

- postsynaptic membrane
- junctional folds
- receptors



② Visceral motor nerve ending

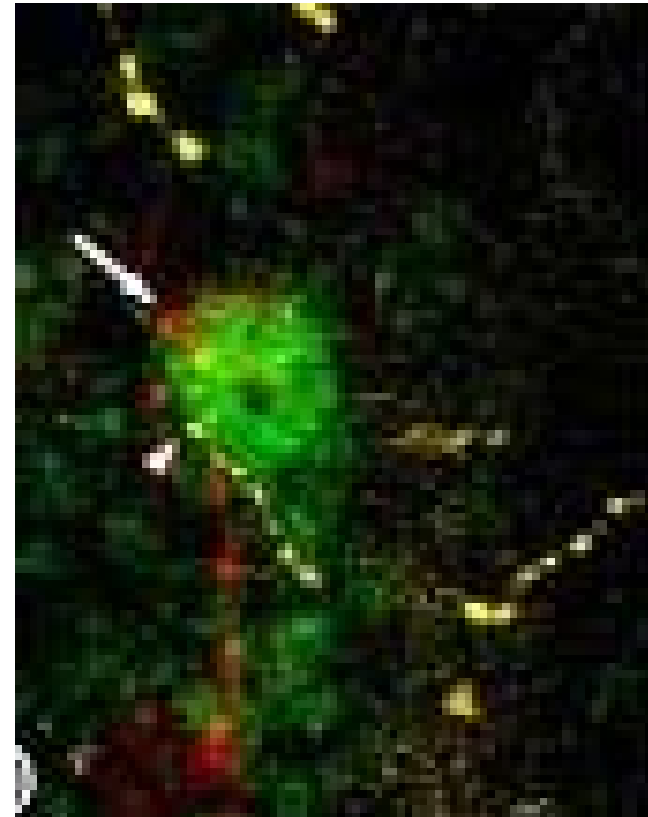
---structure

LM: NF are thin, no myelin sheath
form varicosity
like beads

EM: chemical synapse

---distribution

smooth M, cardiac M and gland





nerve ending

sensory nerve ending motor nerve ending



- **free nerve ending**
- **tactile corpuscle**
- **lamellar corpuscle**
- **muscle spindle**

motor end plate

visceral motor nerve ending



Key points

- **Origin of connective tissues.**
- **Classification of connective tissues.**
- **Loose connective tissue:** the cells(fibroblast, macrophage, mast cell and plasma cell), fibers (collagenous fiber, elastic fiber, and reticular fiber) and ground substance (molecular sieve and tissue fluid) of
- **Dense connective tissue.**
- **Adipose tissue.**
- **Reticular tissue**



• Homework

- 1. What are the nervous tissues consisted of ?***
- 2. What are the structure and function of nervous cell body ?***
- 3. What are the structure of the chemical synapse under electron microscope ?***
- 4. Describe the type and function of glial cells ?***
- 5. Describe the type and function of sensory nerve endings ?***