



# PNS histology

## 1 The myelin

In CNS → by oligodendrocytes / don't have neurilemma ( because excess cytoplasm, directed centrally toward the oligo.. cell body )

In PNS → by schwann cells / e neurilemma ( outermost part of schwann cells contain its nucleus & cytoplasm surround the axon of neuron)

White fatty material / consists of many layers of the modified cell membranes of Schwann cells which have high lipid content. The plasma membrane wraps around the axon. Then the layers of the membranes unit and form myelin

Node of Ranvier (NOR) increases conduction velocity of action potential (= rate of transmission of impulse). action potentials "jump" between Nodes of Ranvier-  
Saltatory conduction: Cuz depolarization can not occur at the cells making up the myelin sheath, the wave of depolarization can only occur at the Nodes of Ranvier. Thus, action potentials appear to jump from node to node when travelling down an axon

Myelinated axons visible when stained by osmic acid (OA) // not stained with HA stain  
لا تلو رج يدوب المايلين

May be myelinated or not

**Axolemma**  
The cell membrane of axon or the plasma membrane of entire axon → to signals transduction

**Neurilemma**  
Have protective functions, and help in regeneration of (n.f) if the cell body of schwann cells not damaged // have 2 glial cells :

Schwann close to axon

Satellite cells found only in ganglia close to nerve cell body

## 2 Functional classification of neurons

- Afferent (sensory) → from the body to CNS
- Interneuron (association) → integrative function
- Efferent (motor) → transmits the response ( from CNS to the end organ )

All have ganglia except the motor somatic nerve have NO ganglia

## 3 synapse → functional contact between neuron & neuron or neurons & target cell ( unidirectional)

1- pre synaptic axon terminal (terminal knob // 2 synaptic cleft // 3 postsynaptic

Two type :

Chemical synapses → neurotransmitter release (Ach) eg: motor end plate

Electrical synapses → ionic signals (gap junction/ intercalated discs) eg: cardiac muscle

## Nerve ending

At receptor\_ receive external or internal stimuli & convert them to nerve impulses - CNS

### According the location

- In epithelium**
  - Free nerve end
  - Hair root plexus
  - Merckle tactile '
  - Neuroepithelium

- In CT**
  - Free nerve end
  - Meissner corpuscle
  - Krause end bulb
  - Pacinian copuscle
  - Ruffin's end organ
  - Golgi tendon

- In muscular tissue**
  - Muscle spindle

### According the type of stimuli

- Exteroceptors → external stimuli - epithelium
- Proprioceptors → muscle tendon stimuli
- Interoceptors → viscera & BVs

At effector → carry orders from CNS to muscles or glands

Ganglia → Ovoid structures contain aggregations of nerve cell bodies & satellite cells supported by CT. Ganglia located outside the CNS (i. e. collection of nerve cell bodies in PNS) They serve as relay station to transmit nerve impulse, one nerve enters & another exit from each ganglia

### Sensory ganglia (31 pairs)

Cranial

Spinal (dorsal root ganglion)

Unipolar (rounded shape)  
Covered with thick capsule  
Large, few in numbers  
Central nuclei  
Arranged in groups between the fibers  
Myelinated + more satellite cell

### Autonomic ganglia (motor) (21-23 pairs)

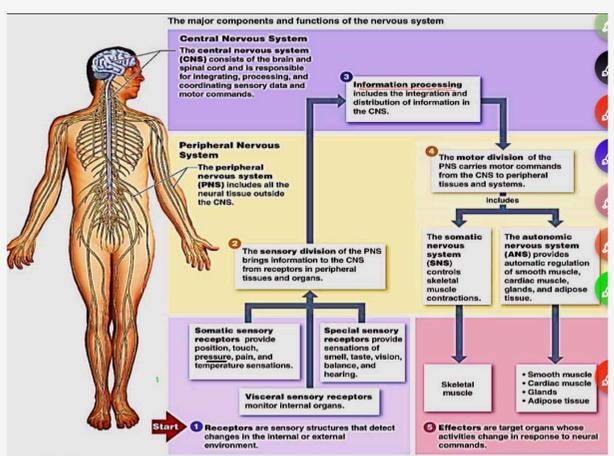
Sympathetic ganglion

Para-sympathetic ganglion

\* thoraco-lumber (T1-L3) \* short pre ganglion + long branching post ganglionic + innervate the blood vessels \* NE neurotransmitter

\* cranio-sacral (1973- S 2,3,4) \* long pre ganglion + short not branching post ganglion \* Ach neurotransmitter

Multipolar  
Thin capsule  
Small, numerous  
Eccentric nuclei  
Scattered, no groups  
Non or less myelinated + no satellite cell



Abrar khalid

