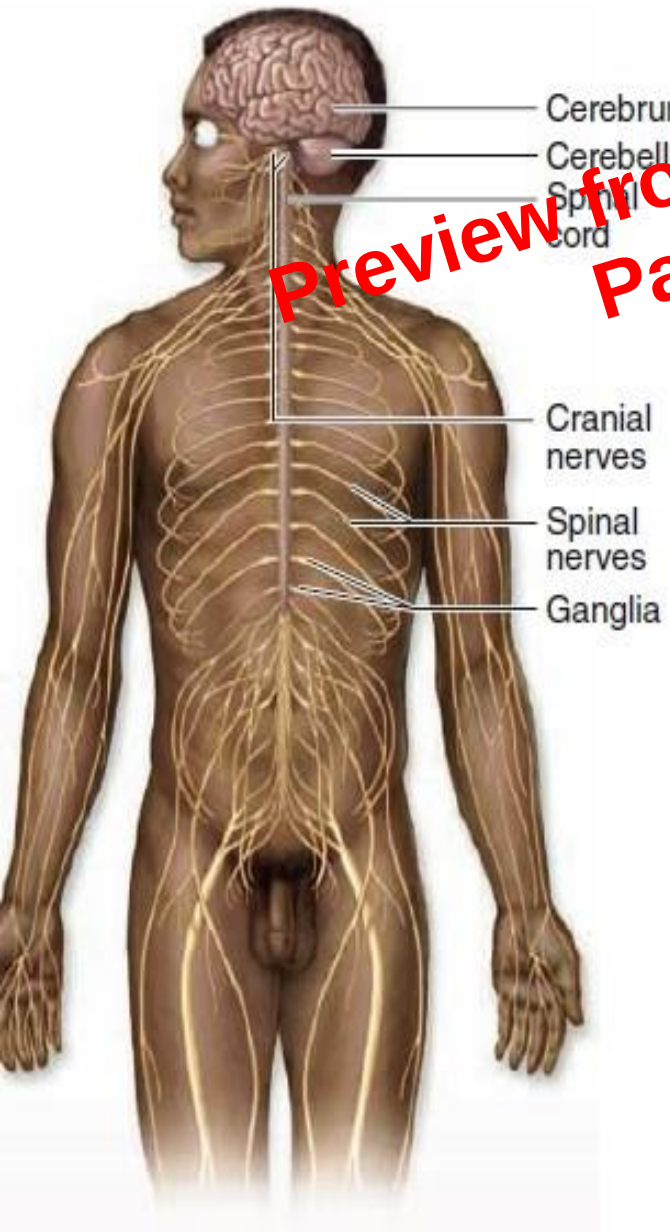
Nerve tissues



- Formed by a network of many billion nerve cells (neurons) & assisted by many more supporting GLIAL cells.
- **Synthesis and conduction of impulses : provide stimuli**
- **Coordinate the functions of other organ systems**

2 divisions of Nervous system

1. CNS : brain & spinal cord
2. PNS : peripheral nerves (Spinal nerves, cranial nerves)

****Ganglia,** small group of nerve cells outside the CNS

Important notes

- **Stimuli**, environmental changes
- Neurons respond to stimuli by **altering the ionic gradient** that exists between their inner and outer membranes.
- All cells maintain such gradient **(ELECTRICAL POTENTIAL)** but cells rapidly change this potential in response to stimuli/ reversal of the ionic gradient **(MEMBRANE DEPOLARIZATION)**>>> propagation of this phenomenon is called action potential/ depolarization wave/ nerve impulses>>> **transmission of signals to other cells**>>> continuous stabilization of the intrinsic condition of the body

- Eq. Blood pressure, blood glucose level, hormone level

A. Neuron

– **Functional unit of both CNS & PNS**

I. Classification of neurons according to the number of processes:

1. Multipolar neurons: 1 axon, 2 or many dendrites
2. Bipolar neurons: 1 axon and 1 dendrite
3. Unipolar neurons (Pseudo-unipolar): single process that bifurcates close to the perikaryon.

   : 1 axon and 2 branches

Bidirectional **transport of small and large molecules** along the axon:

A. ANTEROGRADE TRANSPORT

- Organelles and macromolecules synthesize in the cell body
- Move along the axon from the perikaryon to the synaptic terminals

***KINESIN**: microtubule-activated ATPase

B. RETROGRADE TRANSPORT

Opposite direction from the periphery to the cell body

Ex: macromolecules

***DYNEIN**

Three structures of synapse:

a. Presynaptic axon terminal (terminal bouton)

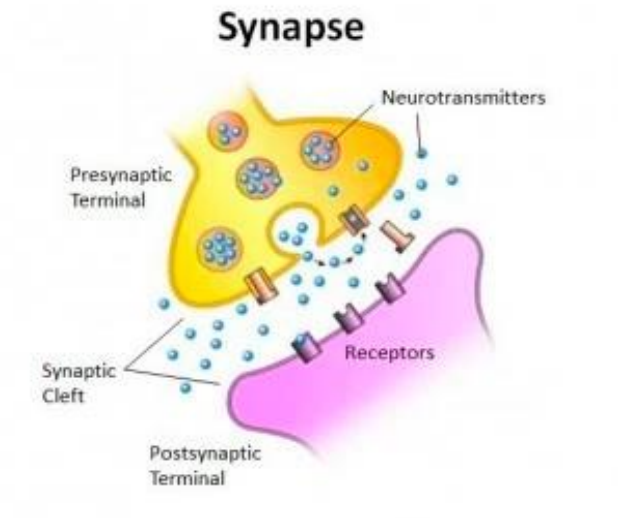
- from which neurotransmitter is released

b. Postsynaptic cell membrane

- with receptors for the neurotransmitter & ion channels/ other mechanisms to initiate a new impulse.

c. Synaptic cleft

- 20 – 30 nm wide intercellular space separating the presynaptic and postsynaptic membrar



Morphological variation of synapse

- Axosomatic synapse
- Axodendritic
- Axoaxonic