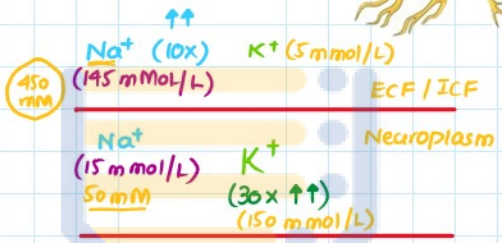
Lecture # 2

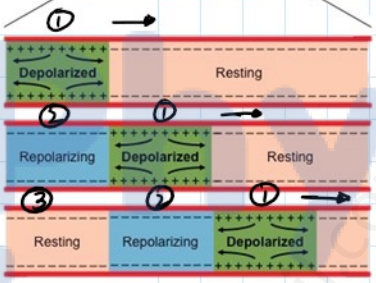
Oscilloscope (Measure) → **NERVE IMPULSE** → Wave of Electro-chemical change.
Unidirectional, Irreversible

RECEPTOR → SENSORY NEURON → CNS → MOTOR NEURON → EFFECTOR

MCQ's

Unequal distribution of Ions ← **RMP:**
(Resting memb. Potential)
Potential measured at no conduction.
−70 mV (PTB)
−65 mV (STB)
−90 mV (Cardiac cells)



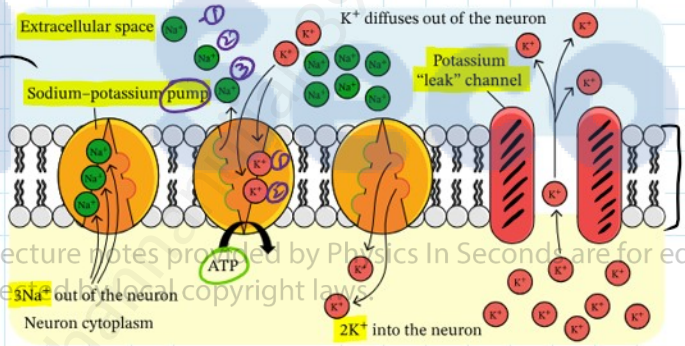


Electropositive (Na^+ ↑↑)

Electronegative
→ Proteins / Amino Acids
→ RNA / SO_4 / PO_4

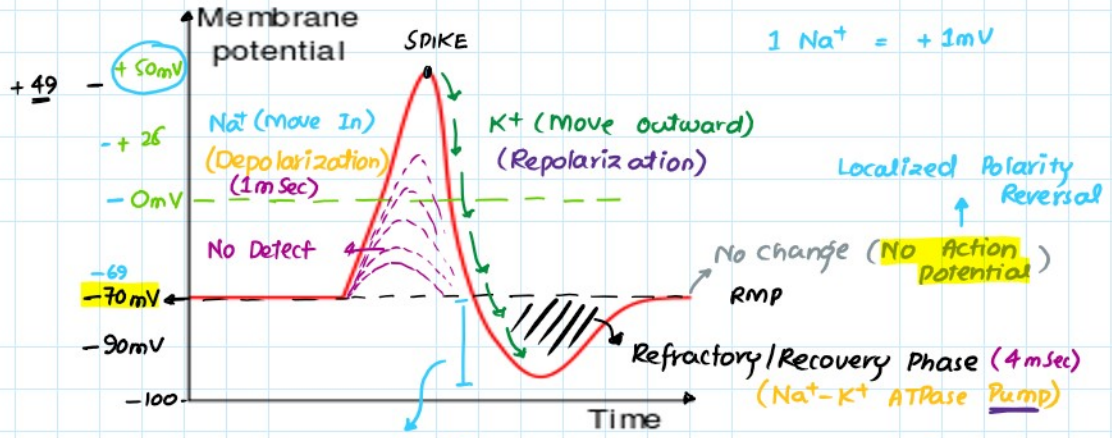
1. Na^+-gates/channels (Moves Na^+ inside) → Depolarization (Passive)
2. K^+-gates/channels (Moves K^+ outside) → Repolarization (Passive)

3. Recovery Phase
Refractory Phase
→ Active Transport



ECF → Extra cellular Fluid
↑ Impermeable to all ions
NEUROLEMMA
↳ Permeable to (K^+)
NEUROPLASM

- Stimulus → Any change which body can detect.
- Threshold Stimulus → Minimum value which body can detect.
- Sub-threshold Stimulus → which body can not detect.



1 Na^+ = + 1mV

Localized Polarity Reversal

RMP

Pump
3 Na^+ (Outside)
2 K^+ (Inside)
5 cations movement

250 Impulses/sec

SYNAPSE → Connection between Excitable cells (Neurons + muscle)
Microscopic gap between excitable cell.

Neuron → Neuron
Neuron → Muscle

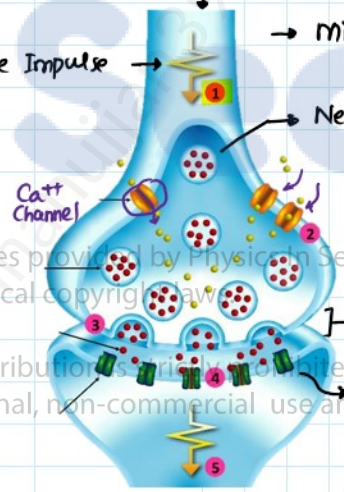
40/100 types
NEUROTRANSMITTERS
Gases*

Excitatory ↑↑ Na^+ Permeability
- Acetylcholine
- Biogenic Amines
  - → Epinephrine
  - → Nor-Epinephrine
  - ✓ Dopamine
- GABA
- Endorphins
- Glycine

Inhibitory ↓↓

GABA → Gamma Amino-Butyric Acid

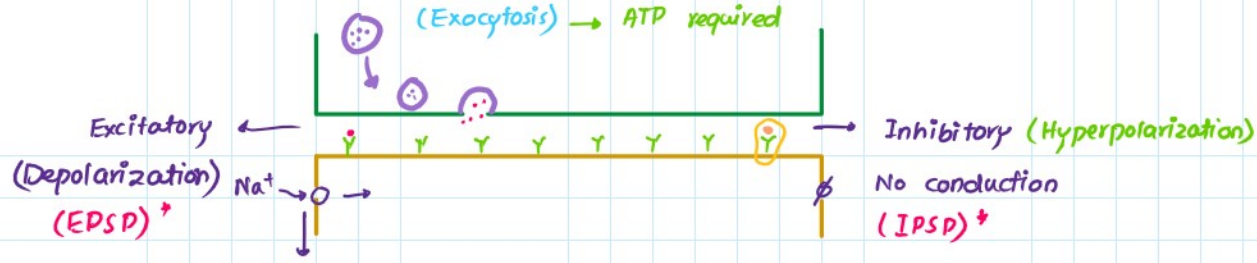
Pre-Synaptic Neuron (Transmitting Neuron)
(Axon/Efferent Extension)



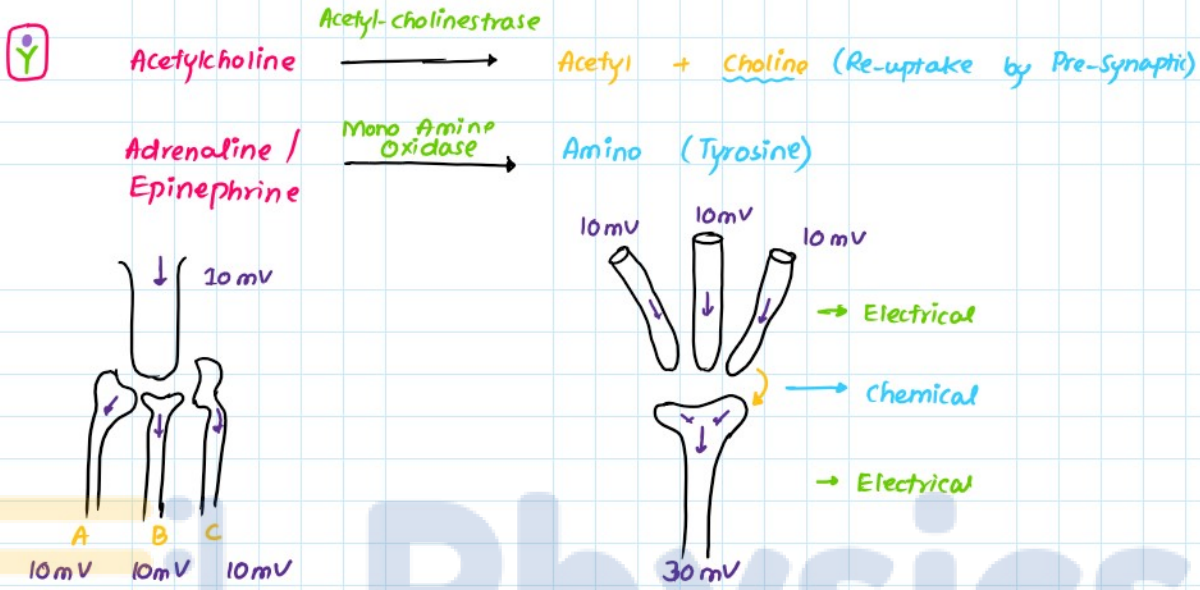
→ Mitochondrias ↑↑ ∝ ATP ↑↑ (Active Transp.)
→ Neurotransmitter Vesicles (Golgi Apparatus) (10,000 molecules) → Neurotransmitters
→ Synaptic cleft
- Electrical Synapse (0.2 nm) (Heart conduction)
- Chemical Synapse (20 nm)

→ Receptors/Gutters

(Dendrites/Afferent Extensions)
Post-Synaptic Neuron (Receiving Neuron)



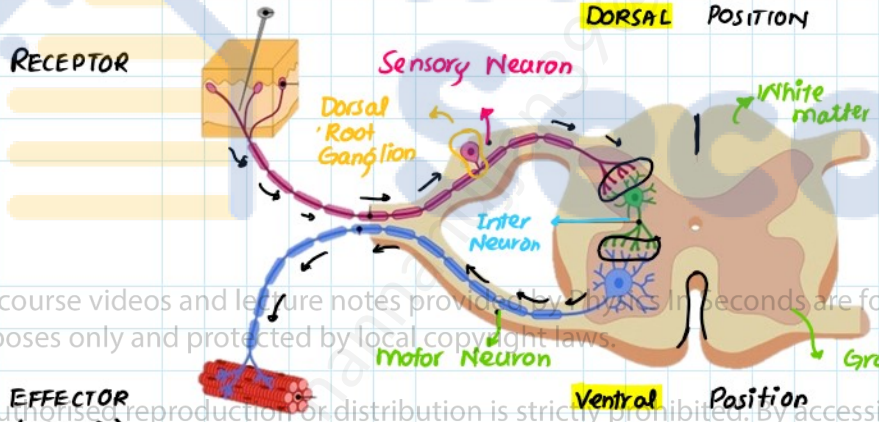
Acetyl-cholinestrase
Acetylcholine → Acetyl + Choline (Re-uptake by Pre-Synaptic)



REFLEX ACTION → RESPONSES → Spontaneous, Involuntary, Automatic

NEURONS → (2)
- Sensory Neuron
- Motor Neuron ↔ 1 Synapse → Mono-Synaptic Reflex

REFLEX ARC → Pathway followed by Reflex Action.



COMPONENTS :
- Receptor
- Sensory Neuron
- CNS (Inter)
- Motor Neurons
- Effectors

- → Mono-Synaptic Reflex
- → Poly-Synaptic Reflex

GANGLIA ← Collection of cell bodies → NUCLEI
(PNS) (CNS)

REFLEX ARC

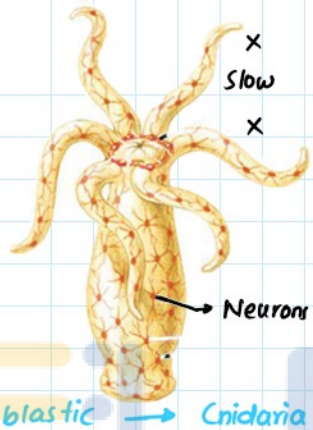
Pathway followed by reflex action is called reflex arc.

CLASSIFICATION OF SYNAPSES

EVOLUTION OF NERVOUS SYSTEM

DIFFUSED NERVOUS SYSTEM

Primitive Nervous System



× Slow ×

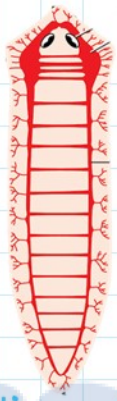
- Diplo blastic → Cnidaria
- Triplo blastic → Echinodermata

CENTRALIZED NERVOUS SYSTEM

Modern Nervous System

- HEAD
- Nerve Impulse
- Classification of Neurons

✓ Rapid ✓



- Collection of axons or dendrites.
  - Nerve (PNS)
  - Tract (CNS)

- Triplo blastic ✓
  Platyhelminthese → Chordates

PAST PAPER QUESTIONS

The type of neuron that carries nerve impulse from tissue and organ to the spinal cord and brain:

Receptor → CNS

ETEA – 2022.

A. Sensory neuron
B. Motor neuron (CNS → Effector)
C. Intermediate neuron (CNS), Relay Neurons
D. Associative neuron (CNS)

The reflex action is the phenomenon which only involves:

MDCAT – 2019 :.

× A. Brain, Receptors, spinal cord
× B. Receptors, Neurons, Brain
C. Receptors, Effectors and Spinal cord
× D. Receptors and Effectors

An automatic, involuntary response to any change external or internal is called:

NUMS – 2022.

A. Reflexes
B. Instincts ×
C. Taxis ×
D. Tropism ×

During an involuntary action, nerve impulse is passed through a pathway called:

BUMHS – 2022 ::

× A. Reflex action of nerve impulse
× B. Reflex action of glands
× C. Reflex arc and reflex action
D. Reflex arc

The resting membrane potential of neuron is measured about:

ETEA – 2022 ...

✓ A. -30 millivolts

The resting membrane potential of neuron is measured about:

ETEA – 2022 ...

A. -30 millivolts
B. 50 millivolts
C. -70 millivolts (RMP) → "Polarized"
D. 100 millivolts