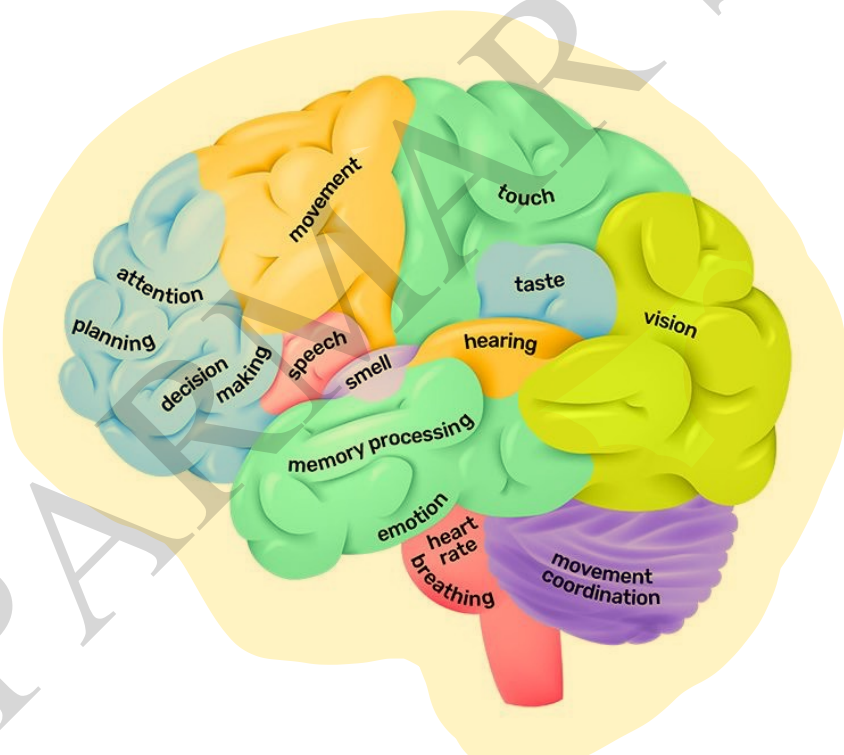
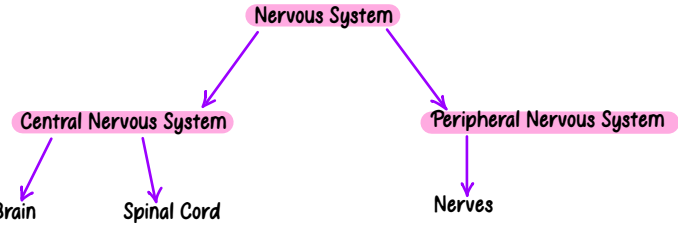
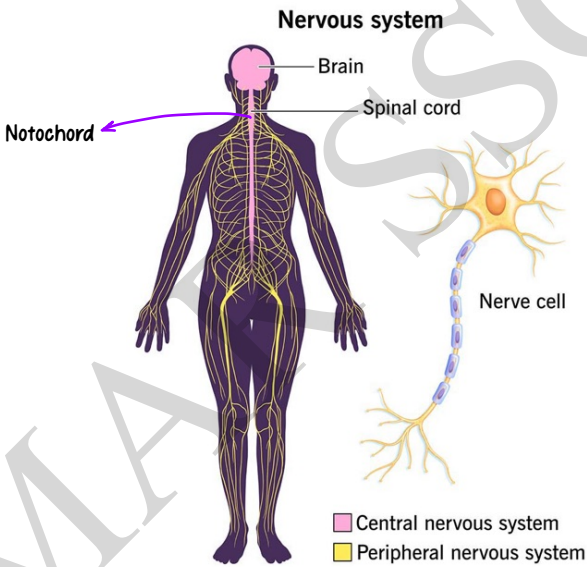
BRAIN





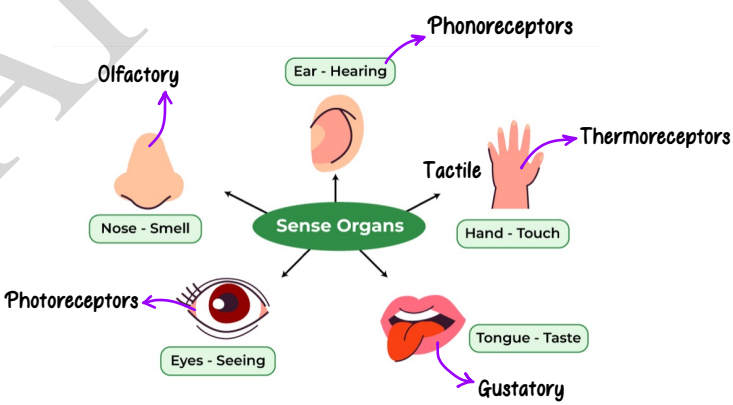


→ **Vestigial organs**: organs, tissues or cells in the body, which are no more functional, the way they were in their ancestral form of trait

Examples:

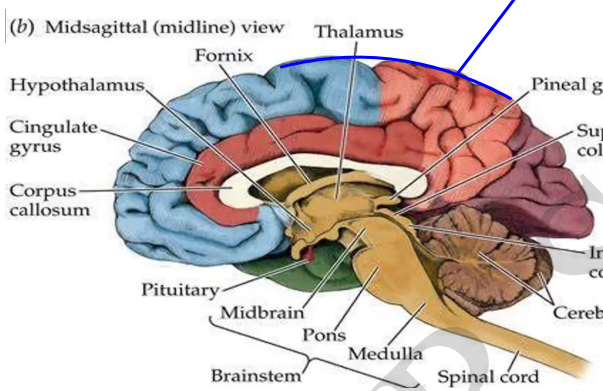
- Tailbone
- Coccyx
- Wisdom tooth
- Pinna
- Tonsils

→ Sense Organs

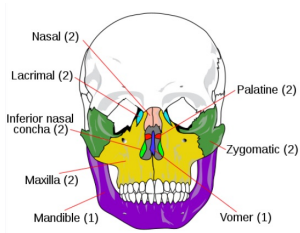


Control and Coordination

Layer of brain called "Meninges" that covers and protects the brain



inflammation of meninges causes a disease called "Meningitis"



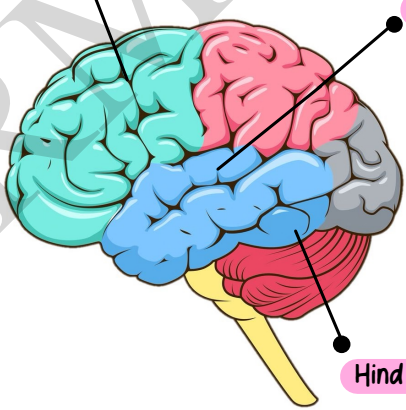
14 facial bones

Parts of Brain

Fore Brain

major part of brain

Mid Brain



Hind Brain

smallest portion of brain

Brain
- Male: 1400 g
- Female: 1300 g

→ Adult

→ The adult brain accounts for a mere of 2% of body weight 20% of O_2 and 20–25% of Glucose

→ Meningitis: an inflammation or swelling of protective membrane, covering the brain and spinal cord
- Caused by a viral or bacterial infection

- Total no. of bones in brain: 22
  - 14: Facial bones
  - 8: Cranial bones

Fore Brain

Function

- Controls voluntary action
- Associated with hunger, memory, pain

loss of memory

loss of memory and difficulty in performing day to day function

Parts

- Cerebrum (Memory) — Associated diseases: Amnesia and Dementia
- Thalamus (Pain and Sensation) — Touch (skin), Nose, Tongue
- Hypothalamus (Regulates body temperature and Hunger thrust and Sleep)

Alzheimer's Disease

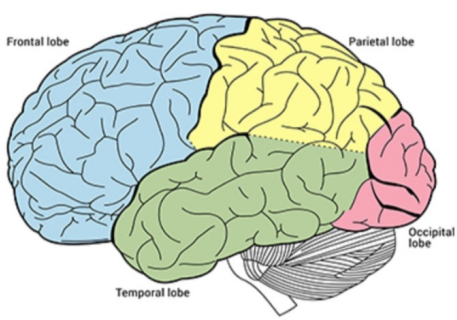
Fore brain > Hind brain > Mid brain

Mid Brain

Function

- Controls involuntary actions such as change in pupil size and reflex movements (vision, hearing)

Eye movement and pupil dilation



Hind Brain

Function

a) Cerebellum

- Controls posture and balance

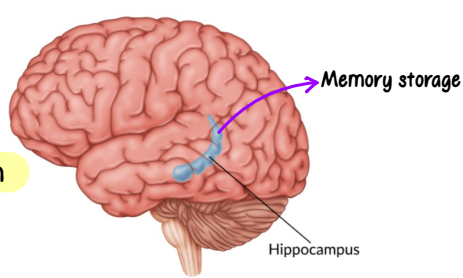
b) Pons

- Connects Brain and Spinal Cord

c) Medulla Oblongata

- Controls ANS – Respiration/heartbeat/Digestion

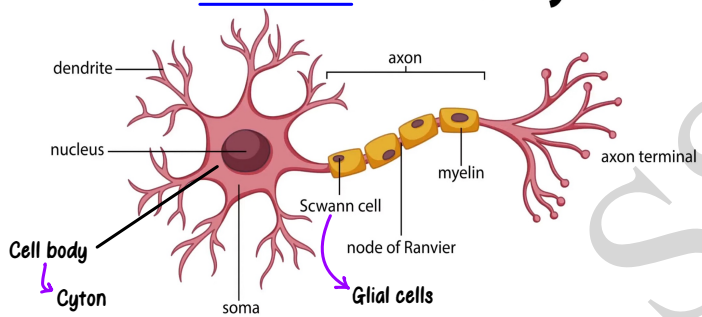
Automatic Nervous System



basic unit of nervous system

Longest cell in our body

Neuron Anatomy



Synapse

- Gap between nerve ending of one neuron's and dendrite of other neuron. Here electrical signal is converted into information which is in the chemical signal

Hormones

- Hormones discovery: E.H. Starling

Plant Hormones
- Growth related
- Not growth related

Types

1) Auxin

- Growth hormone
- It is involved in phototropism (response towards light)

2) Gibbrelin

- Growth hormone
- Responsible for germination/flowering

3) Cytokinins

- Promote cell division
- Cyto: cell
- Kinin: division

4) Abscisic Acid

- It inhibits growth
- It is a stress hormone

5) Ethylene ——— Gaseous hormone

- It helps in fruit ripening

Hormones in Animals

Types

1) Endocrine Glands

- They are ductless glands
- They secrete hormones into the blood

eg: adrenal glands, pituitary glands, etc

Ductless Glands

a) Thyroxine

- Released by thyroid gland ——— largest endocrine gland
- Located in neck region ——— Butterfly shape
- Due to the deficiency of Iodine, thyroid gland is affected and causes a disease known as Goitre

Thyroxine Hormone
- Hypothyroidism: thyroid gland doesn't produce enough thyroid hormone
- Hyperthyroidism: overproduction of thyroid hormone

I^{131} used in treatment of goitre

- Anti diuretic hormone
- Helps kidney to control the amount of water

When secreted in less amount leads to dwarfism

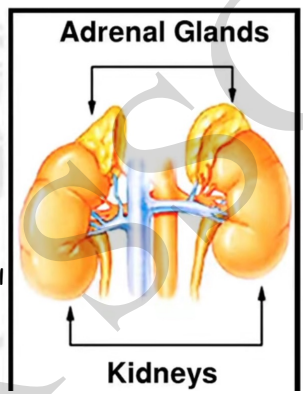
When secreted in surplus amount leads to Acromegaly

b) Growth Hormone

- It is secreted by pituitary gland (Master Gland)
- Growth hormone is also known as Somatotropin

c) Adrenal Gland

- It regulates blood pressure, heart beat
- It located above kidneys
- Also known as "Fight or Flight hormone"
- Deficiency causes — Addison's disease



Insulin & Glucagon

- It helps in regulating blood glucose level
- Sugar levels ↑
- ∝ cells

- Secreted by Pancreas — 2nd largest gland
  - Mixed gland
  - cells: β cells of Islet of Langerhans
- It regulates sugar levels (glucose level in the blood)

Sex Hormones

- In male: Testosterone — involved in secondary sex characteristics
- In female: Estrogen/Progesterone
  - female secondary sex characteristics
  - regulating menstrual cycle, pregnancy

Melatonin

- Regulate sleep
- Released by Pineal Gland — pea-sized gland
- It is located in brain

Plant Movement

Types

1) Nastic Movement

- Not growth related

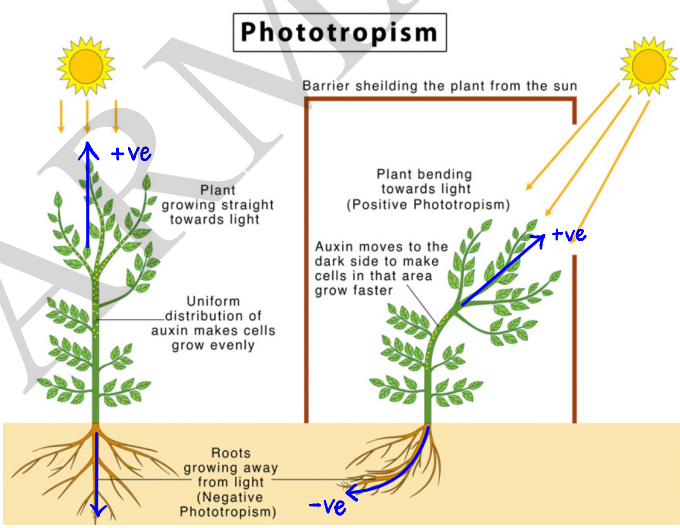
eg: movement in response to touch: Thigmonastic Movement — "touch me not" plant

2) Tropic Movement

- Growth related

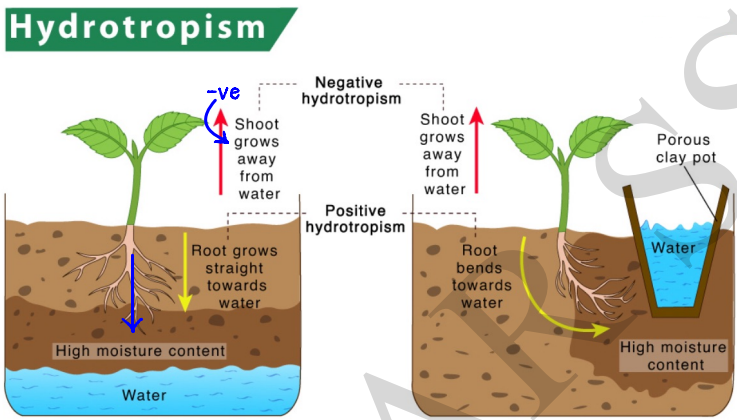
a) Phototropic movement

- Movement in response to light
- Positive movement: Towards the light source
- Negative movement: Away from the light source



b) Hydrotropism Movement

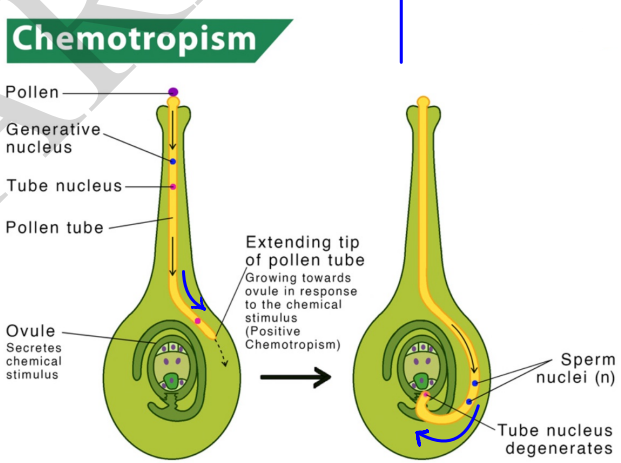
- Movement in response to water



c) Chemotropism Movement

- Movement in response to chemical stimuli

eg: Growth of pollen tube towards the ovule



d) Geotropism Movement

- Movement in response to Gravity