

STRUCTURAL ORGANIZATION IN ANIMALS



Rana tigrana
Cold-blooded

Male Reproductive System
- **Testes** : Pair of yellowish ovoid structures. adheres to upper part of kidneys by mesorchium.

Female Reproductive System
- A pair of ovaries situated near kidneys.
- No functional connection with kidneys by mesorchium.

Fertilization
- External in water.
- Development involves a larval stage, tadpole.
- Tadpole Adult.

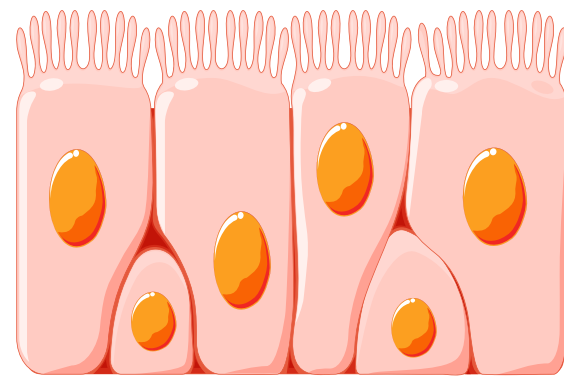
Circulatory System
- Heart: 3-Chambered. 2 Atria + 1 Ventricle.
- Ventricle opens into conus arteriosus on ventral side of heart.
- Blood from heart is carried to all body parts by arterial system.

Blood Vascular System
- Heart + Blood vessels + Blood.
- RBCs are nucleated and red in color

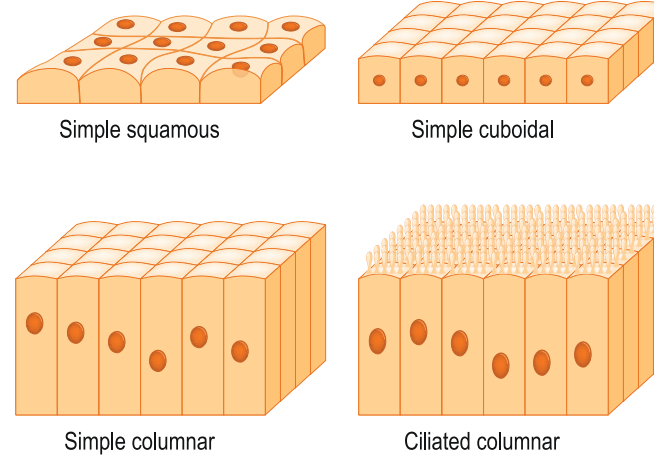
Lymphatic System
- Lymph + Lymph channel + Lymph nodes.
- Lymph has no RBC's

Digestive System
- Short alimentary canal + digestive glands.
- Mouth → Buccal cavity → Stomach → Intestine → rectum → cloaca.
- Digested food is absorbed within intestine and undigested solid waste is removed via cloaca.

Respiratory System
Land- Buccal cavity skin and lungs as pulmonary respiratory organs.
Water- Skin acts as cutaneous respiratory organ.



EPITHELIAL CELLS



Animal tissue

Cell Junction

Tight- check the flow between cells.
Gap- helps in between cells' communication.
Adhering- cements the cells together.

1) Epithelial Tissue

i) **Glandular**: Columnar and cuboidal are specialized and for secretion.

ii) **Simple**: made of single layer of cells.

iii) **Compound**

Unicellular - goblet cells of alimentary canal
Multicellular - Salivary glands
Endocrine - Pituitary, thymus
Exocrine - Sweat & Sebaceous glands

Squamous
- function is exchange of material, filtration & little absorption.
- living cavity organs like heart, lungs etc.

Squamous
- Protection against abrasion.
- Epidermis of skin, hair & oral cavity.

Cuboidal
- Absorption & secretion.
- tubules and ducts of glands & surface of ovary.
Columnar
- Secretion & absorption.
- Gastrointestinal tract.

Columnar
- Protection & secretion.
- Epiglottis & mammary glands.
Cuboidal
- help in mechanical & chemical stress.
- Sweat glands, and canal & female urethra.

Ciliated
- Movement of mucous & egg.
- Respiration tract & fallopian tube.

Pseudo - Stratified
- Protection & movement
- Salivary glands, trachea, and male urethra.

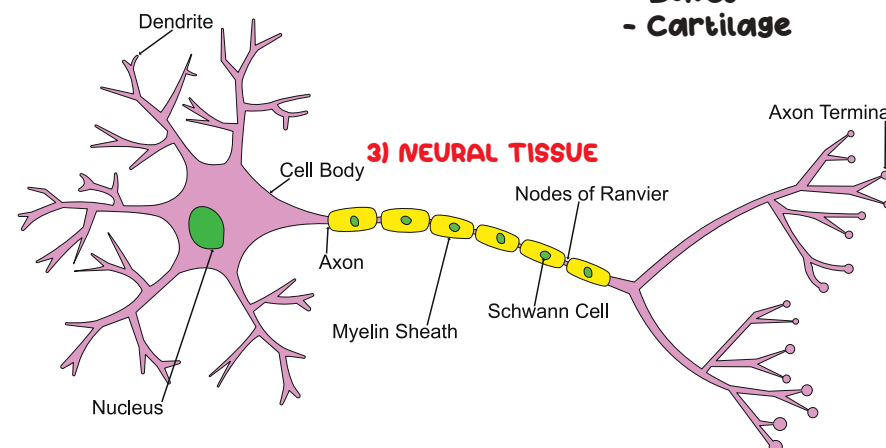
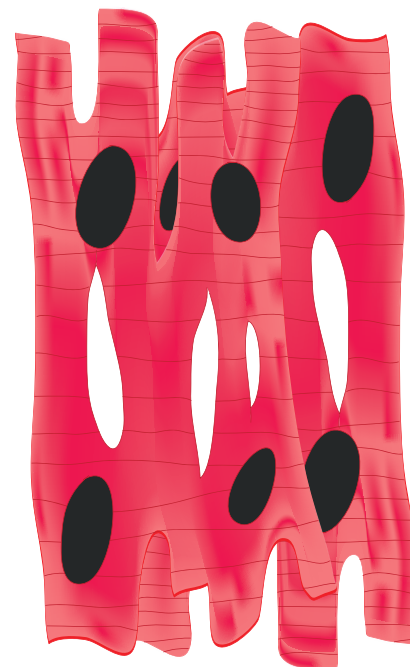


Diagram of Neuron



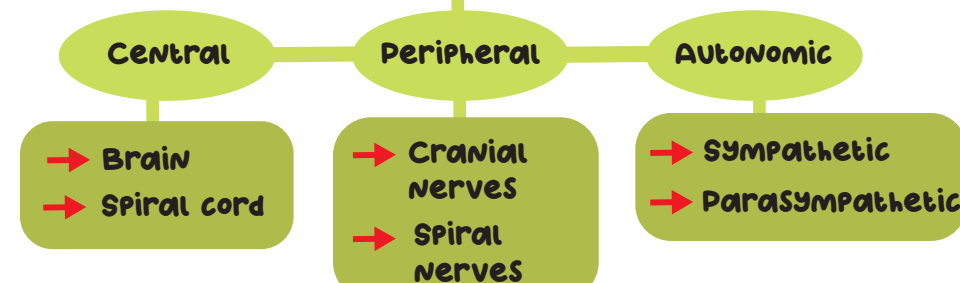
4) MUSCULAR TISSUE
- **Skeletal/ Striated** - long & cylindrical present in limbs, tongue & pharynx
- **Smooth / Unstriated** - walls of visceral organ
- **Spindle shaped** with pointed end
- **Cardiac** - long & cylindrical
- **Uninucleate**
- **Present in Heart**

LOREM IPSUM



Cardiac muscle tissue

Nervous System



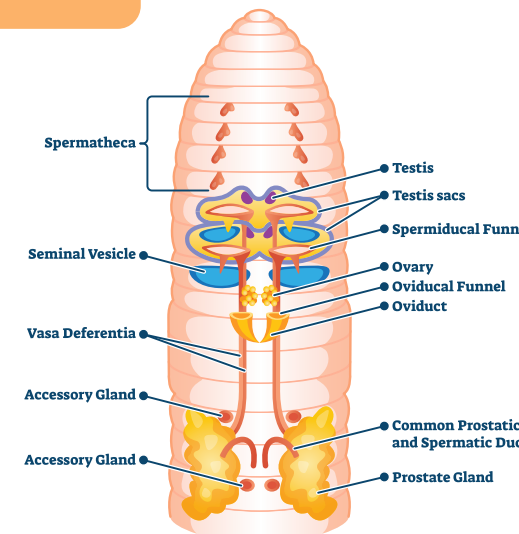
- **Brain**- Present in cranium. has 3 parts:-
1) Fore brain 2) Mid brain 3) Hind brain

Common indian varieties Peretima and Lumbricus

Reproductive System (Hermaphrodite)
Male- 2 pairs of testes (10th and 11th).
- Vas differentia upto 18th segment.
- One pair of accessory gland in 17th and 19th segments.
- 4 pairs of Spermathecae in 6th - 9th segments.

Female- 1 pair of ovaries at 12th intersegmental septa of and 13th.
- Ovarian funnels beneath ovaries.
- Oviduct opens on 14th segment as female genital pore.

REPRODUCTIVE SYSTEM OF EARTHWORM



Nervous System

- Represent by ganglia.
- Ganglia arranged on ventral paired nerve cord.
- The bifurcated nerve cord joins the cerebral ganglia dorsally to form nerve ring.
- Cerebral ganglia commands muscular responses.

Respiratory System

- No specialized breathing organ system.
- Exchange occurs via moist body surface into blood stream.

CLOSED CIRCULATORY SYSTEM (19-26)

- has blood vessels, capillaries and heart.
- contraction helps blood circulation in one direction.
- Smaller blood vessels supply the gut, nerve cord & body wall.
- Blood glands in 4th 5th & 6th segment produce blood cells & hemoglobin.

Periplaneta Americana
Nocturnal omnivores



Male Reproductive System
- Pair of testes at 4th-6th abdominal segment.
- Genital pouch has -1) ANUS 2) Male genital pore 3) Phallomere
- Anal style present

Female Reproductive System
- Pair of ovaries at 2th-4th abdominal segment.
- Genital pouch has -1) female gonopore 2) spermathecal pores 3) collateral glands
- Anal style absent.

Respiratory System

- Trachea, divided into tracheoles
- Tracheoles carry oxygen to all body parts.
- Trachea opens via spiracles.

Vascular system

- **Open type**
- Blood, called Haemolymph has colorless plasma and haemocytes.
- Alary muscles help in circulation.
- Heart is dorsal and 13 chambered.

Alimentary canal

- Divided into - foregut, midgut and hindgut.
- Mouth opens into → Pharynx → Oesophagus → Crop (food storing region) → Gizzard, where grinding of food occurs → Hepatic Caeca → Midgut → Malpighian tubules → Hindgut.
- Hindgut is divided into ileum, colon and rectum.
- Rectum opens out through anus.

General Features

Body - Head - Thorax - Abdomen
- Head has compound eye, ocellus and antennae.
- Has mosaic vision for nocturnal vision

