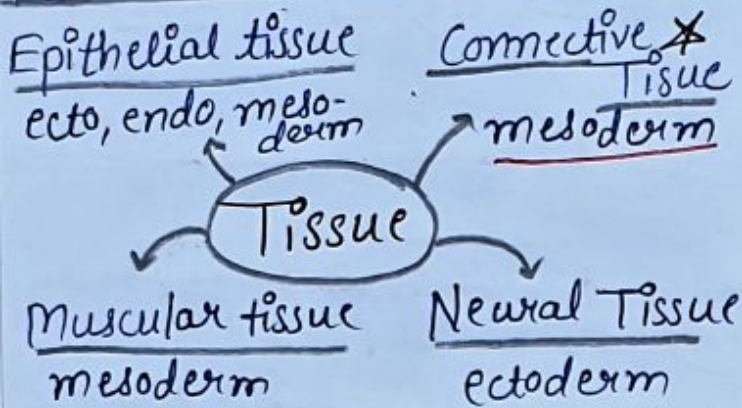


# STRUCTURAL ORGANISATION IN ANIMALS →

Tissue → Group of similar cells, along with their intercellular matrix having a common origin and performing a specific function



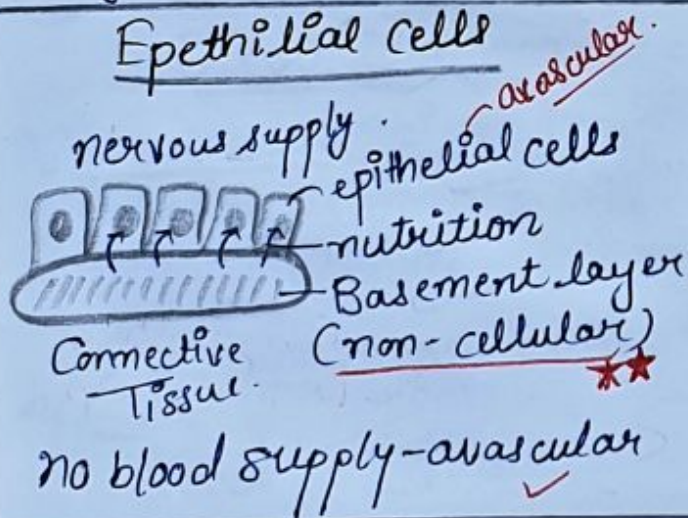
## Epithelial Tissue

provides covering / lining for some part of body

Has free surface, which faces a body fluid or outside environment

Very less intercellular matrix

## Epithelial cells



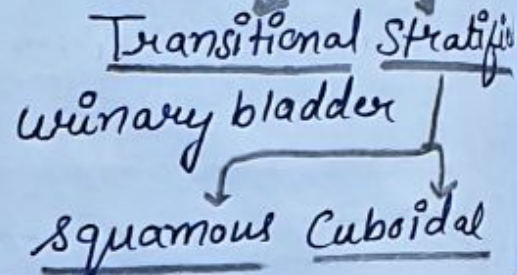
## Epithelial Tissue

### Simple

Lining of body cavities, ducts and tubes.

### Compound

protection

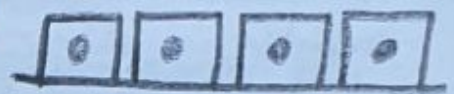


## Simple epithelial tissue →

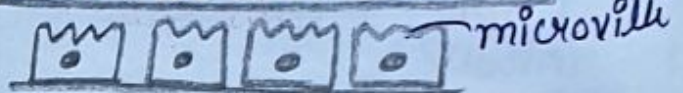
### ① Squamous



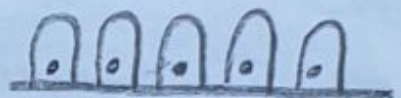
### ② Cuboidal



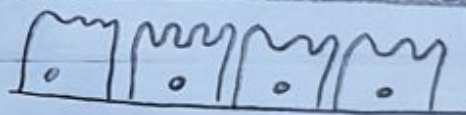
### ③ Brush Border Cuboidal



### ④ Columnar



### ⑤ Brush Border Columnar



### ⑥ Ciliated

Bronchioles and fallopian tube.



### ⑦ pseudostratified



### ⑧ Glandular



## Squamous Epithelium

flattened cells with irregular boundaries

→ Diffusion Boundaries



→ Alveoli (air sacs of lungs)

→ Capillary wall, walls of blood vessels

→ pavement epithelium

→ endothelium

→ peritonium

→ Bowman's Capsule of nephron

Squamous, → podocytes

Loop of Henle → Squamous

PCT, DCT → Brush Border Cuboidal ★

## Cuboidal Epithelium

→ Secretion and absorption

→ Ducts of Glands

→ Tubular part of Nephron



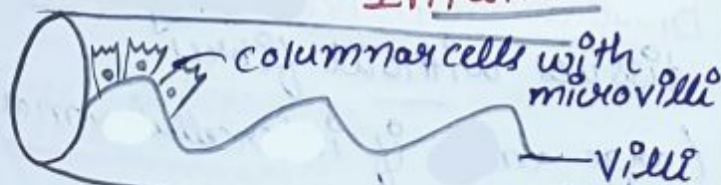
## Columnar epithelium

→ Secretion and absorption

→ Nuclei located at base

→ Lining of stomach ★

→ Brush border Columnar, Intestine



## Ciliated Epithelium

to move particles

→ ciliated cuboidal lower respiratory tract

→ ciliated columnar Upper respiratory tract

Bronchioles

Fallopian Tubes

## pseudostratified Epithelium

Respiratory Tract

## Glandular Epithelium

form glands for secretion

glands

unicellular

multicellular

eg- Goblet Cells

eg- Salivary gland

★ mucous  
respiratory, digestive  
goblet cells are modified columnar cells

glands

on basis of pouring of their secretions

endocrine

have no ducts to release their products (ductless)

Hormones in Blood directly ★

exocrine

have ducts to release products on a surface

Body surface / inner surface of an organ

→ milk, enzyme, earwax, sperm, saliva, sweat (sudoriferous gland), oil glands (sebaceous gland)



## Compound Epithelium

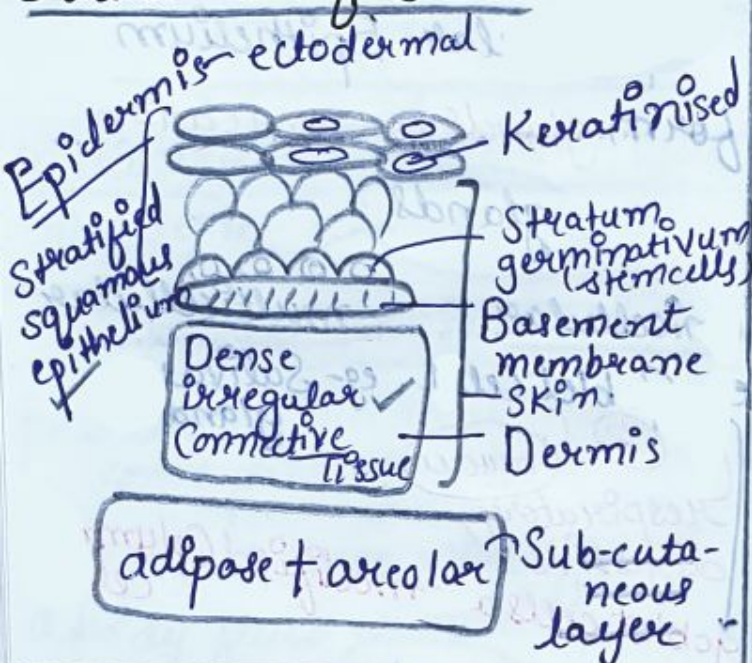
made of more than 1 layer of cells.

No/Limited role in absorption, secretion

provides protection against chemical and mechanical stress.

Keratinised stratified squamous is found in epidermis of skin

## Structure Of Skin →



Non-Keratinised stratified squamous is found in moist surface of buccal cavity, pharynx, vagina

Stratified cuboidal found in duct of larger glands eg - salivary glands and pancreas

## Cell Junctions (Vimp.)

provide structural and functional links b/w individual cells.

→ Found mainly in epithelial cells as well as muscular and neural cells

### Tight Junctions

prevent leakage across a tissue

### Adhering Junction

Cementing between neighbouring cells → actin

### Desmosomes

Cementing b/w neighbouring cells with keratin fibres

### Gap Junctions

Connect cytoplasm of cells for rapid transfer of ions, small molecules and big molecules

### Hemidesmosomes

Connect epithelial cell with basement membrane

## → Connective Tissue →

must abundant and widely distributed tissue

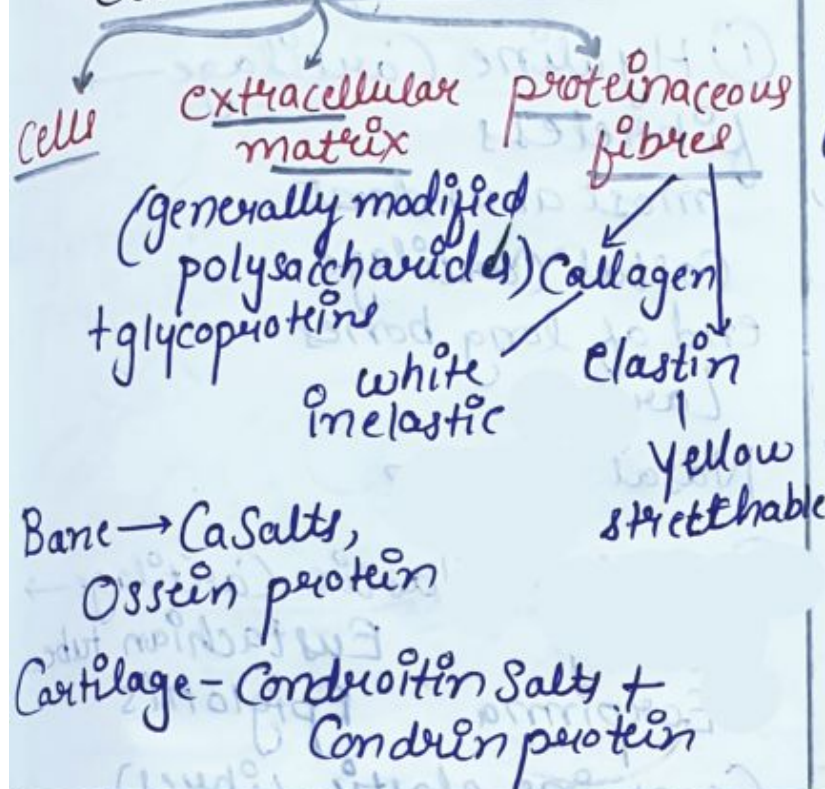
Links and supports other tissues/organs.

Blood and Lymph — only connective tissues without fibres.

Large amt. of intercellular matrix.



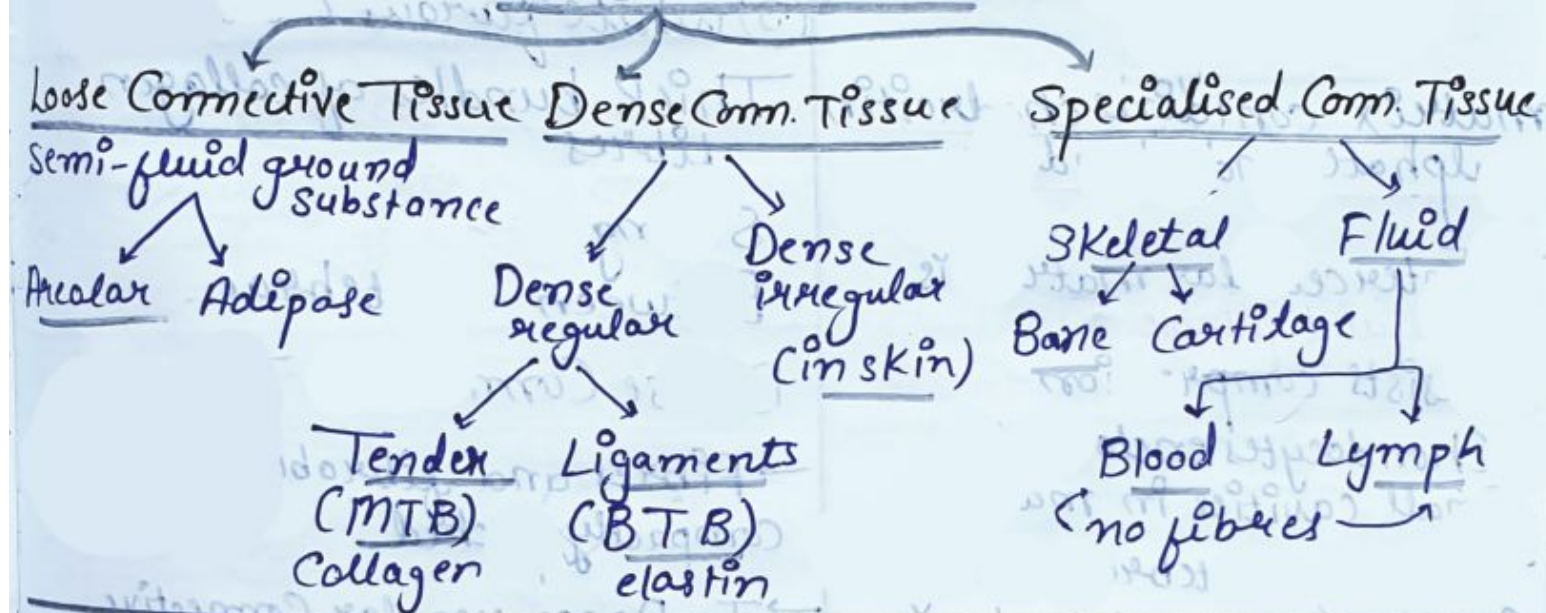
# Connective Tissue



# Axialar Connective Tissue

most abundant, Weakest  
found below skin.  
packaging of Organs  
Supports framework for epinelium  
Contains fibroblasts, macrophages and mast cells

## Connective Tissue



## Cells

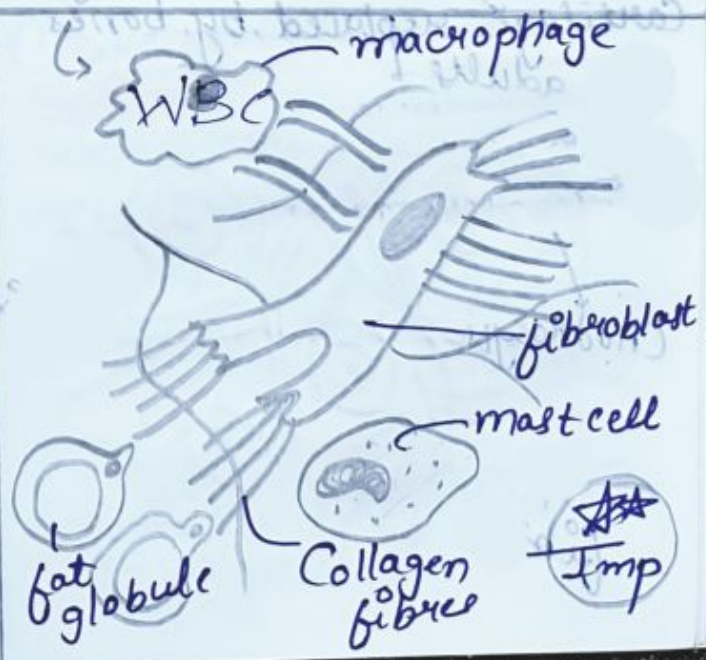
### Common

fibroblast  
WBC  
macrophages

### Specific

Osteocytes  
Chondrocyte

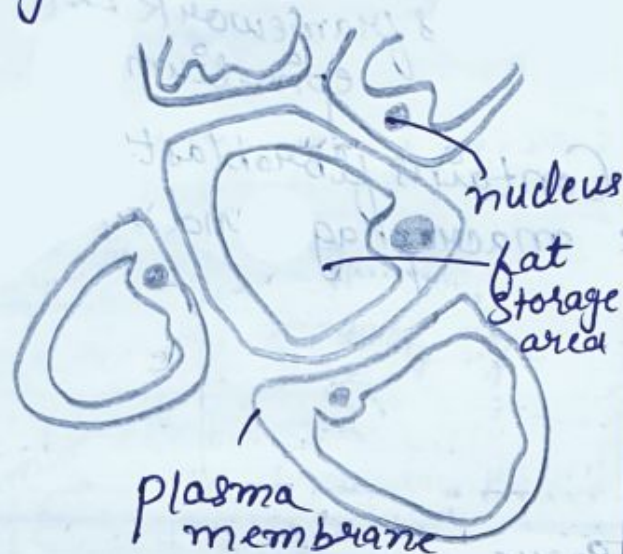
Mast Cells → Histamine  
Heparin





## Adipose Connective Tissue

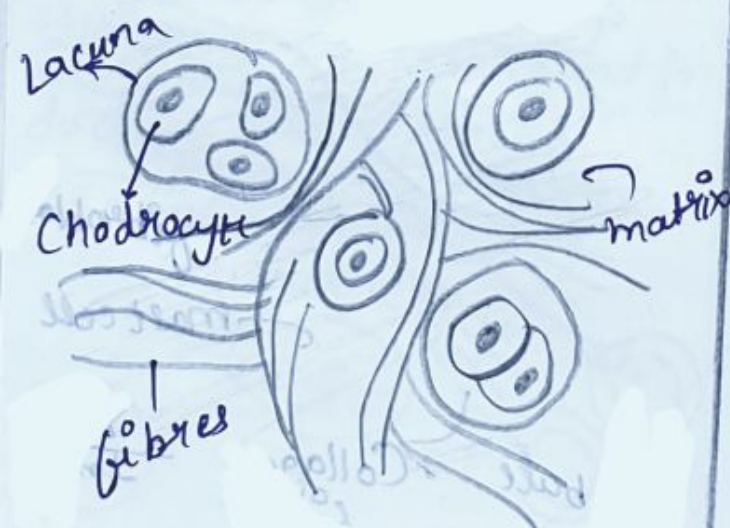
- store fats.
- Beneath skin
- packaging of kidney, heart, eyeballs.



## Cartilage

matrix contains chondroitin sulphate and chondrin protein

- Intercellular matrix is solid and pliable.
- Resists compression
- Chondrocytes enclosed in small cavities in matrix
- Most of vertebrate embryonal cartilage replaced by bones in adults



## Cartilage

- ① Hyaline Cartilage →  
fibresless  
most abundant  
Costal Cartilage  
end of long bones  
Larynx  
Nasal Septum

- ② Yellow Elastic Cartilage →  
Nose tip, Eustachian tube  
Ear pinna, Epiglottis  
(Contains elastic fibres)

- ③ White fibrous Cartilage →  
Thick bundles of collagen fibres  
Strongest  
Between Vertebrae

## Dense Connective Tissue

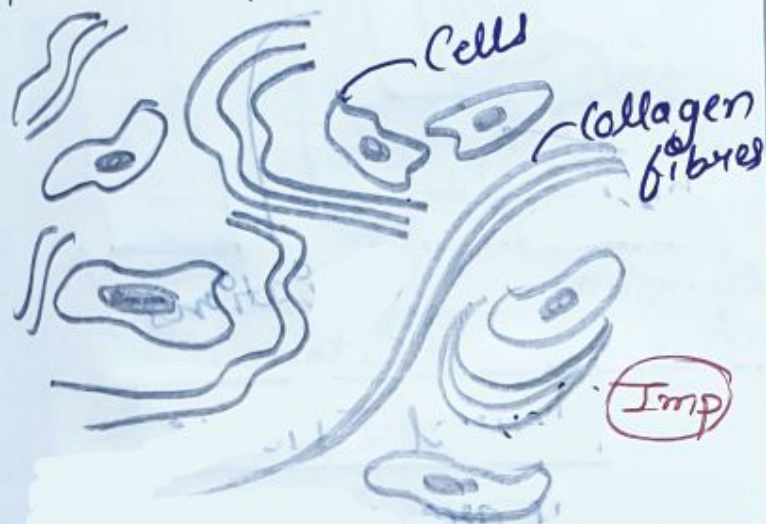
- Fibres and fibroblasts are compactly packed
- In Dense regular Connective Tissue, Collagen fibres are present in parallel bundles, or b/w these bundles  
eg - Tendon and Ligament



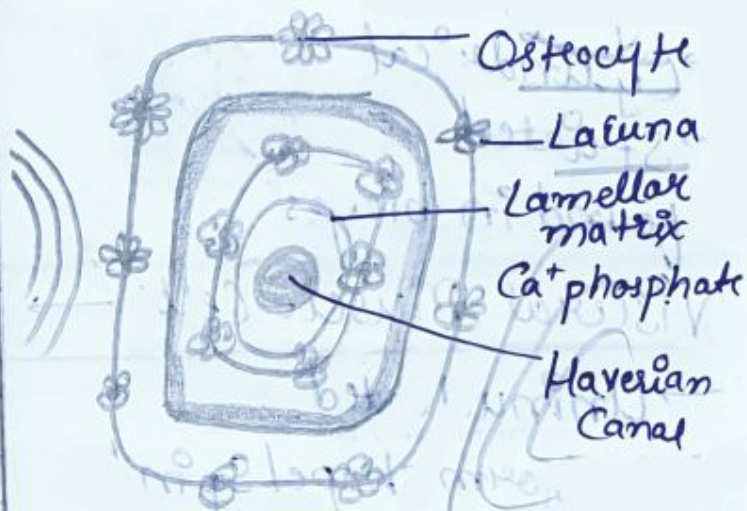


## Dense Irregular C.T.

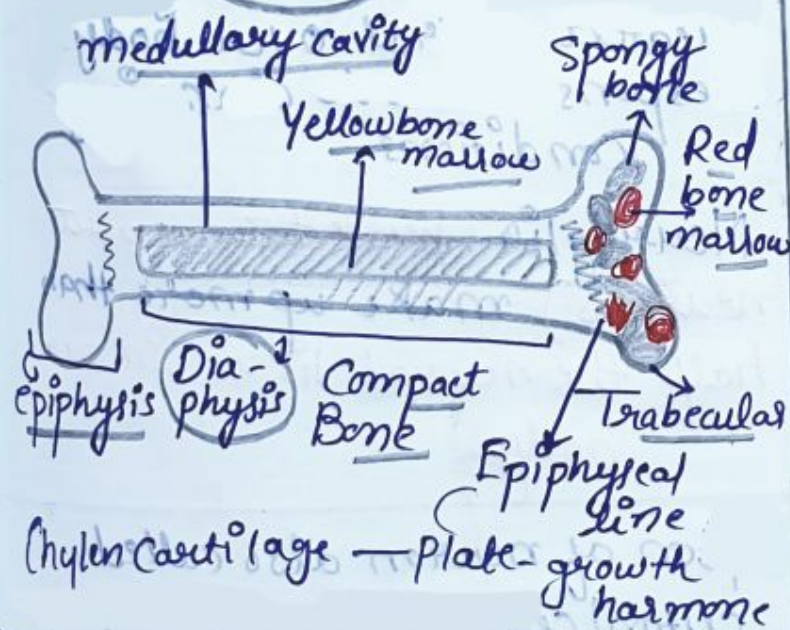
- fibres are oriented in different directions.
- present in dermis of skin
- forms covering i.e. pericardium, periostium, perichondrium etc.



- Supports and protect softer tissues and organs.
- Osteocytes are present in Lacuna
- RBM is site for production of blood cells.
- Weight bearing functions and Locomotion.



## Bone



Haversian system in mammalian bones

Characteristic feature of Mammalian Bones.

## Muscular Tissue

Contractile proteins — actin and myosin

① Skeletal Muscle —

Stimulated

- Voluntary
- Closely attached to skeletal bones

② Visceral Muscle —

Smooth / non-stimulated

- Involuntary
- forms walls of visceral organs

→ Hard and non-pliable ground substance

→ Ossein protein

→  $Ca_3(PO_4)_2$  and collagen fibres give strength

→ provides structural frame to the body.



## Cardiac Muscle

- Striated
- Involuntary
- found in heart

## Skeletal Muscle Cells →

- multinucleated
- Syncytium
- Cylindrical
- striated
- found in biceps



## Visceral Muscle Cells →

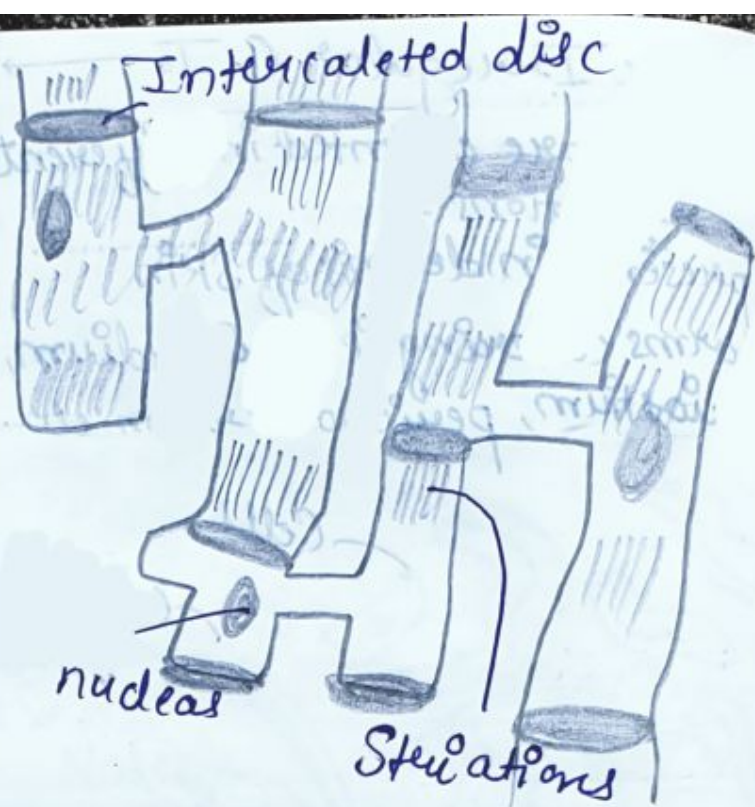
- Uninucleated
- Fusiform shape / Spindle shape
- Found in blood vessels, stomach, intestine etc.
- smooth



## Cardiac Muscle Cells

- Branched
- Uninucleate
- faintly striated
- Cells contract as a unit due to

Intercalated disc  
(with gap junctions and desmosomes)



## Neural Tissue

Neurons are excitable cells

This tissue exerts the greatest control over body's responsiveness to changing conditions.

Neuroglia (protect & support neurons) make up more than half the neural tissue in our body.

Cyton of neuron also called (cyton) cell body / soma / perikaryon

Nissl's granules → RER + ribosomes

Neurolemma → plasma membrane of Schwann cell.

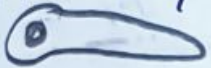
# NEET SLAYER



# Neural Tissue

## Neurons

① Unipolar  
In embryo



② Bipolar  
In retina



③ pseudounipolar  
In dorsal root ganglia of spinal nerves



④ multipolar



Brain &  
Spinal Cord.

## Neuroglia

make up more than  
50% of vol. of  
neural tissue.

PNS

Shwann  
cells

CNS

Oligodendrocytes  
astrocytes  
microglial  
cells

# NEET SLAYER

