SNS COLLEGE OF ALLIED HEALTH SCIENCE

Affiliated to The Tamil Nadu Dr MGR Medical University, Chennai

DEPARTMENT OF CARDIOPULMONARY PERFUSION CARE TECHNOLOGY

COURSE NAME: Anatomy

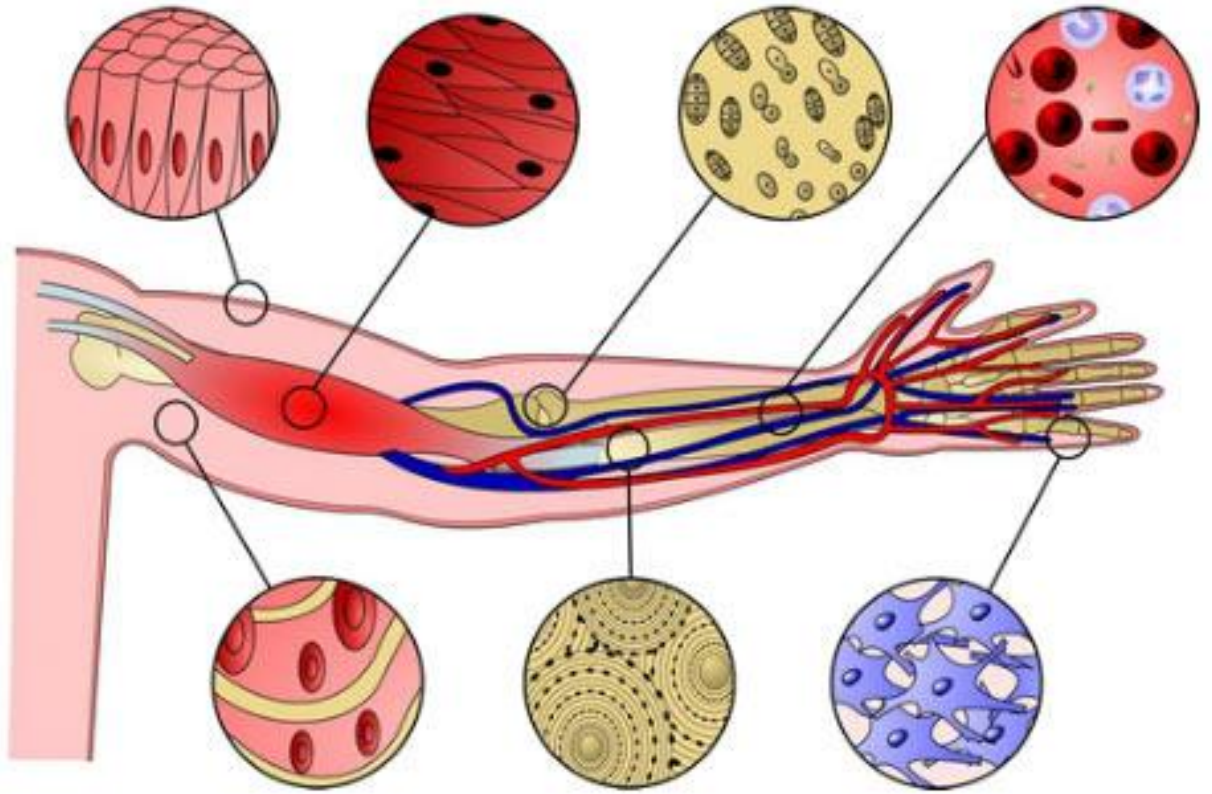
UNIT I – Introduction to Anatomy

TOPIC: Tissues

FACULTY NAME: Mrs. Saranyaa Prasath

Introduction to Tissues

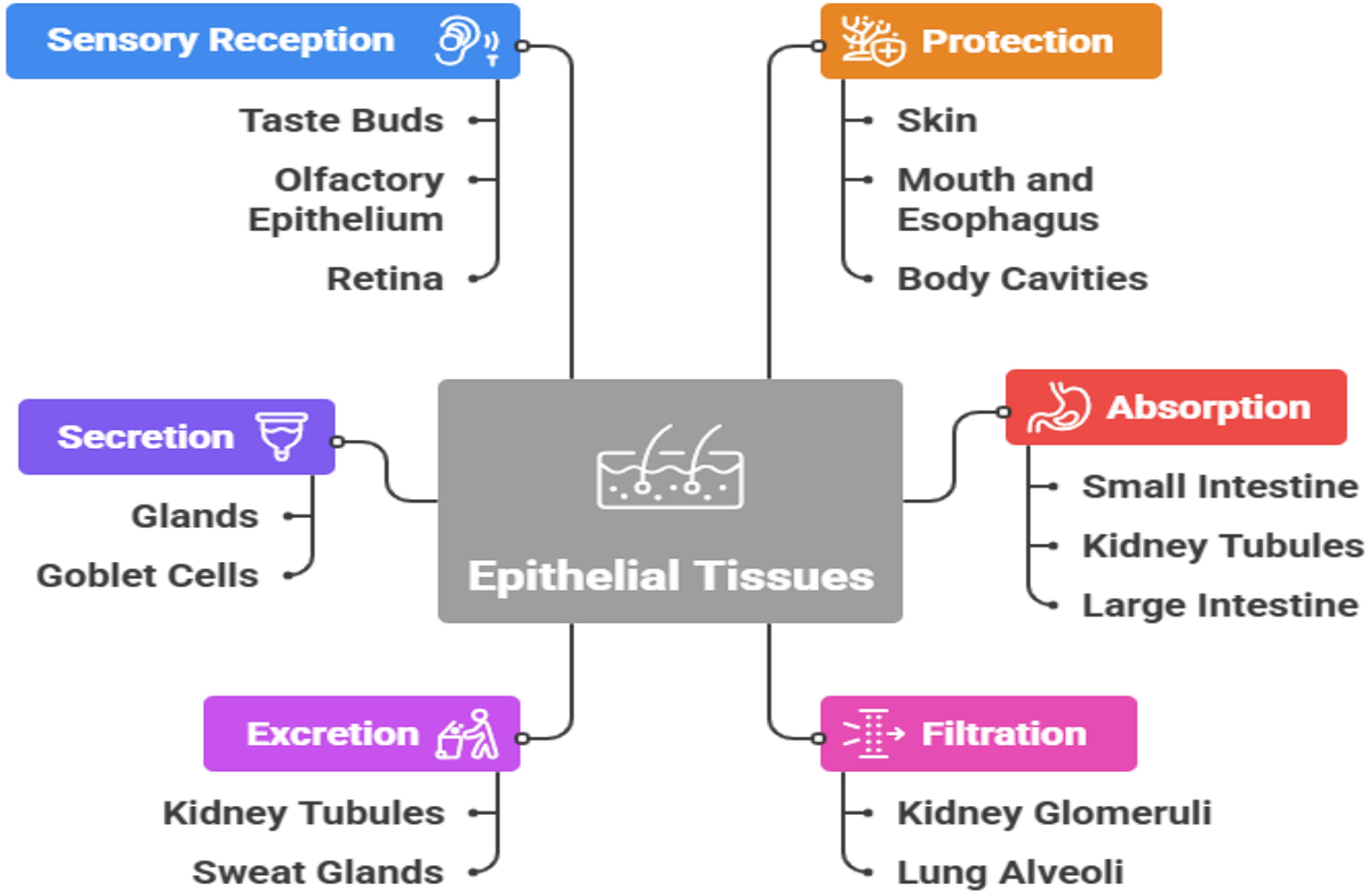
- **Definition:** Tissues are groups of similar cells working together to perform specific functions.
- **Importance:** Tissues form organs and organ systems, enabling complex body functions.



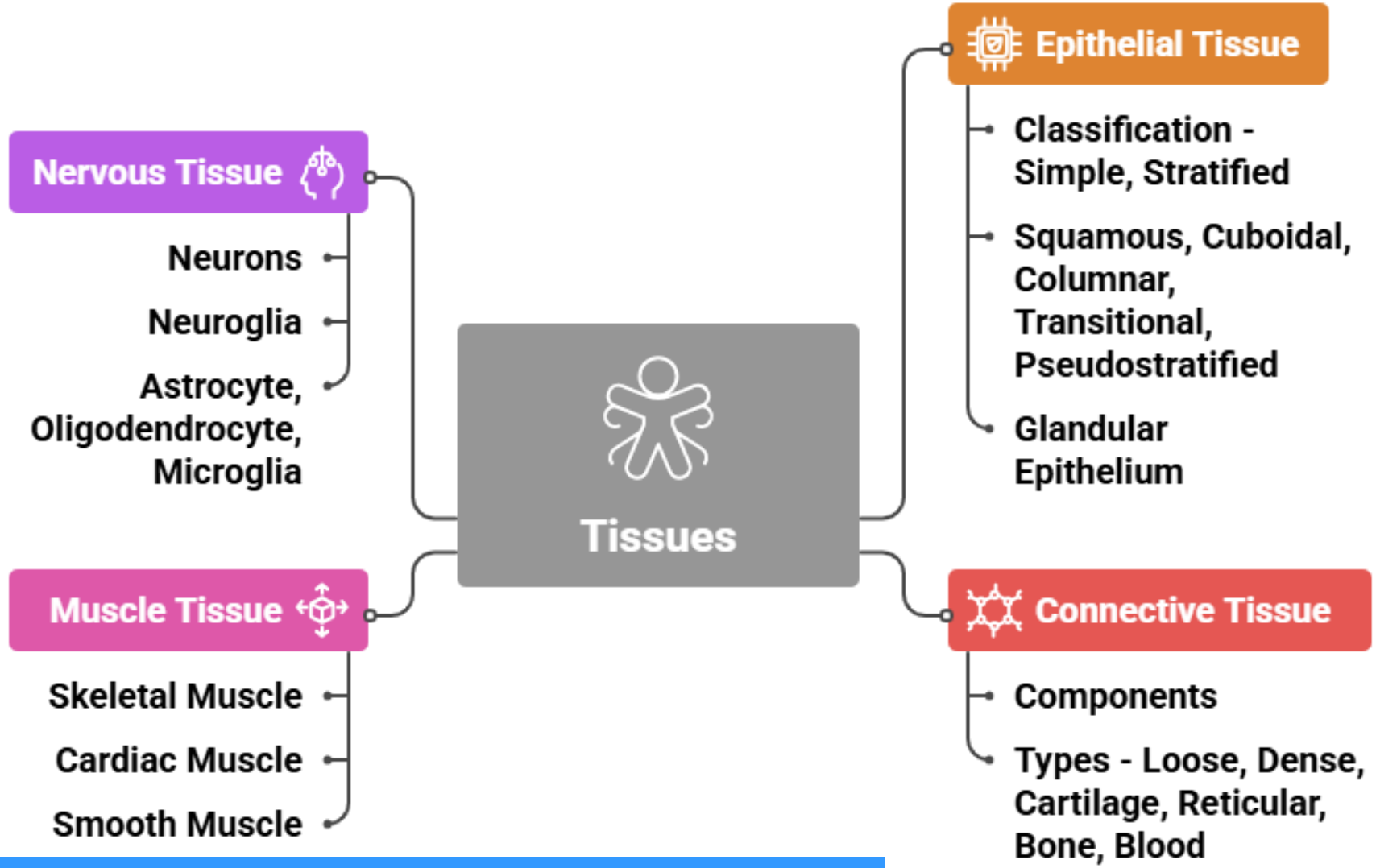
Empathize – Tissue Roles in the Body

Tissues

- Maintain homeostasis
- Provide support
- Protection
- Facilitate movement
- Communication

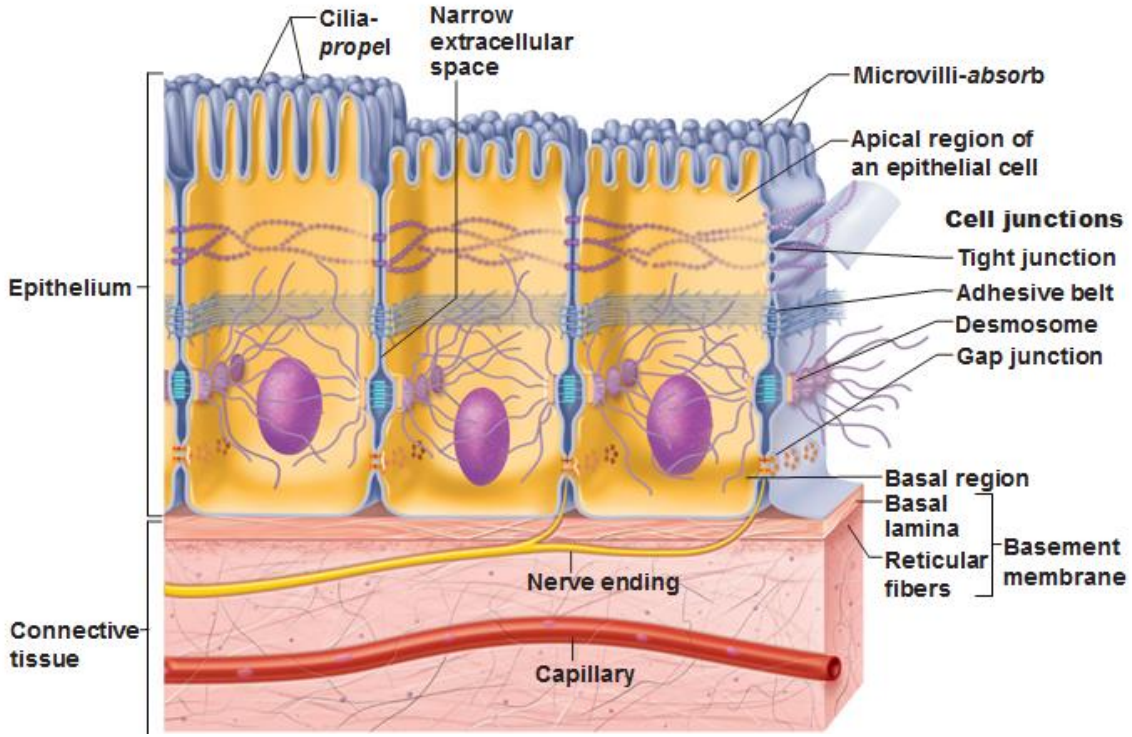


Define - Types of Tissues



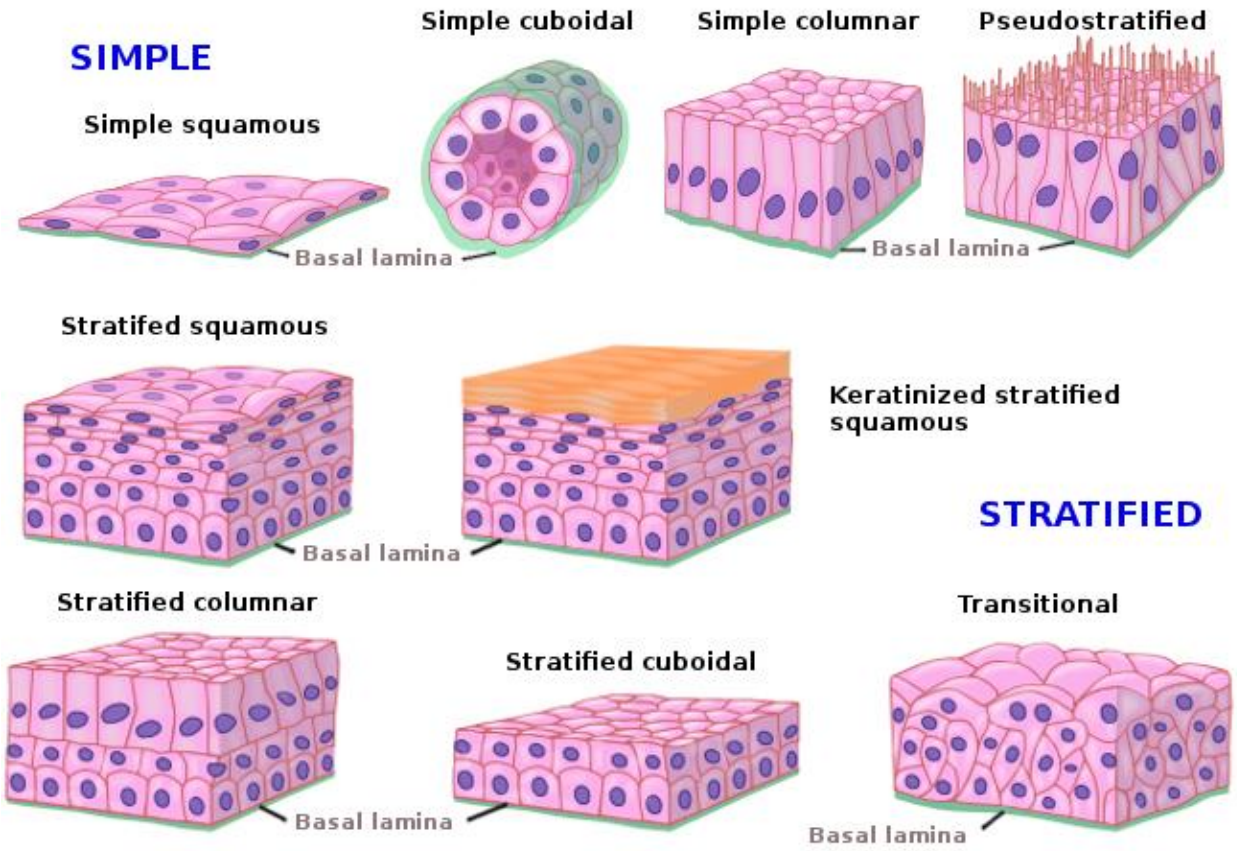
Ideate – Structure of Epithelial Tissues

Characteristics	Description
Cellularity	Tissues comprised of cells, with less Extracellular Matrix
Polarity	Epithelial Tissues has attachment on Apical, Basal Surface
Attachments	Tight Junctions, Gap Junctions, Desmosomes & Hemidesmosomes
Avascularity	Epithelial Tissues doesn't have any blood vessel on its own
Regenerative	It has high regenerative, to replace itself.



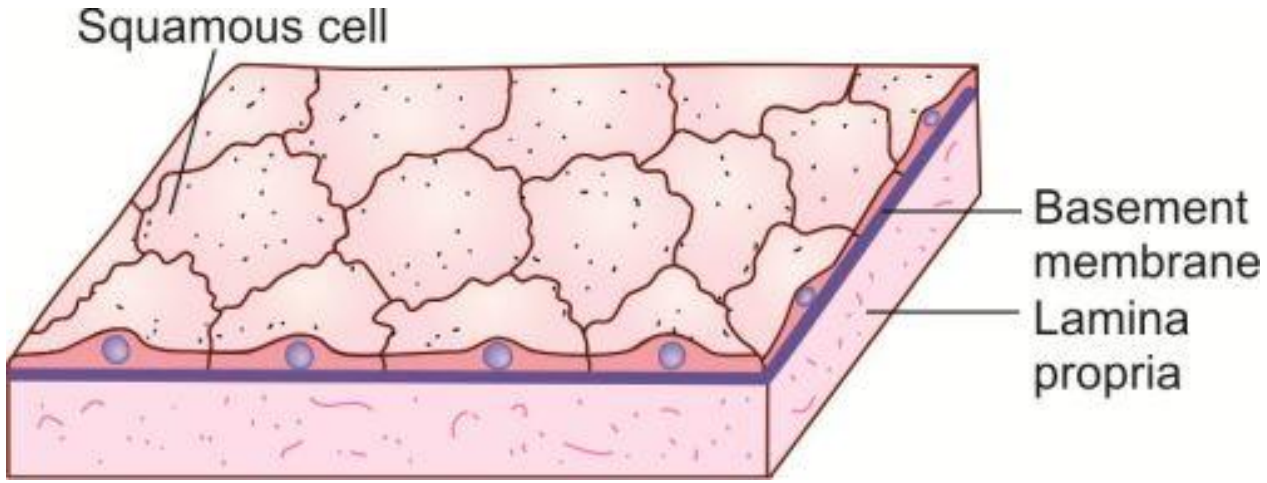
Prototype – Types and Structure

Type	Structure Description
Simple Squamous	Single layer, flat cells
Simple Cuboidal	Single layer, cube-shaped cells
Simple Columnar	Single layer, tall rectangular cells
Stratified Squamous	Multiple layers, flat cells (keratinized/non-keratinized)
Pseudostratified	Single layer, appears multi-layered
Transitional	Variable layers, stretchable cells



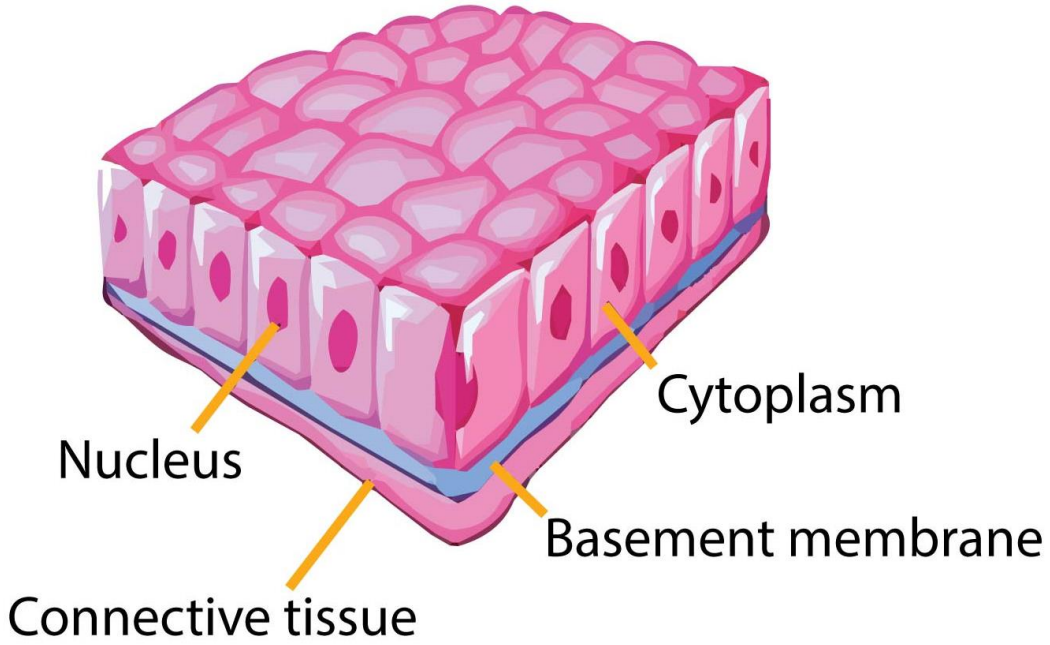
Simple Squamous Epithelium

- **Structure:** Single layer of flat, scale-like cells.
- **Location:** Alveoli of lungs, lining of blood vessels, body cavities.
- **Function:** Facilitates diffusion and filtration; secretes lubricating substances.



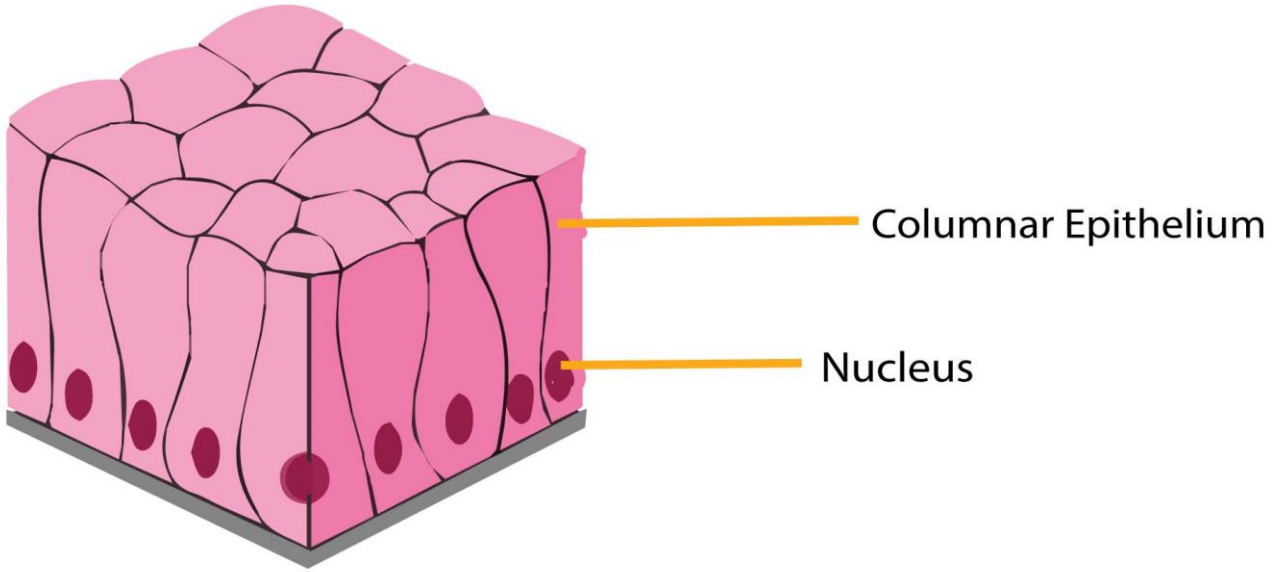
Simple Cuboidal Epithelium

- **Structure:** Single layer of cube-shaped cells.
- **Location:** Kidney tubules, ducts of glands.
- **Function:** Secretion and absorption.



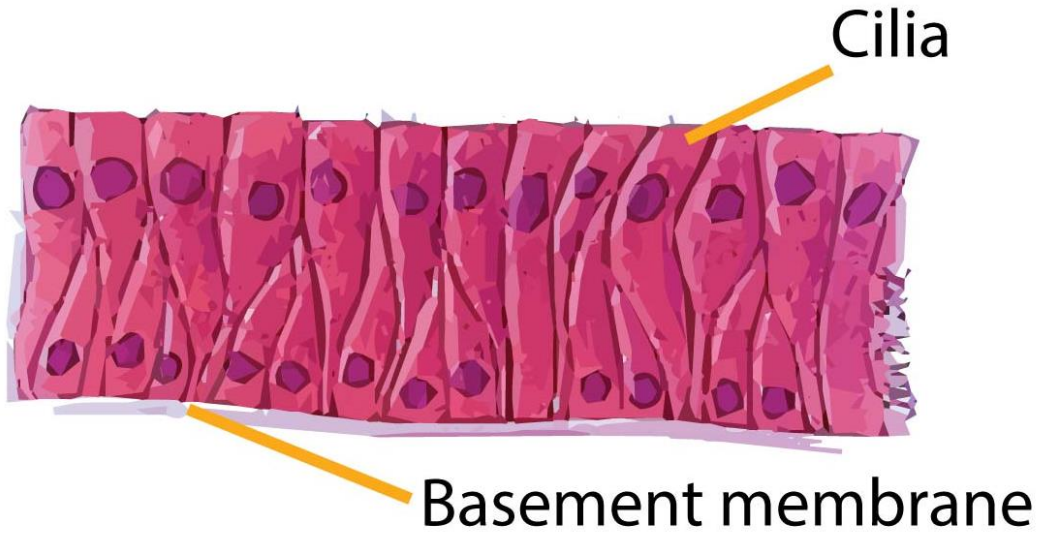
Simple Columnar Epithelium

- **Structure:** Single layer of tall, rectangular cells.
- **Location:** Lining of digestive tract, uterus.
- **Function:** Absorption and secretion of mucus and enzymes.



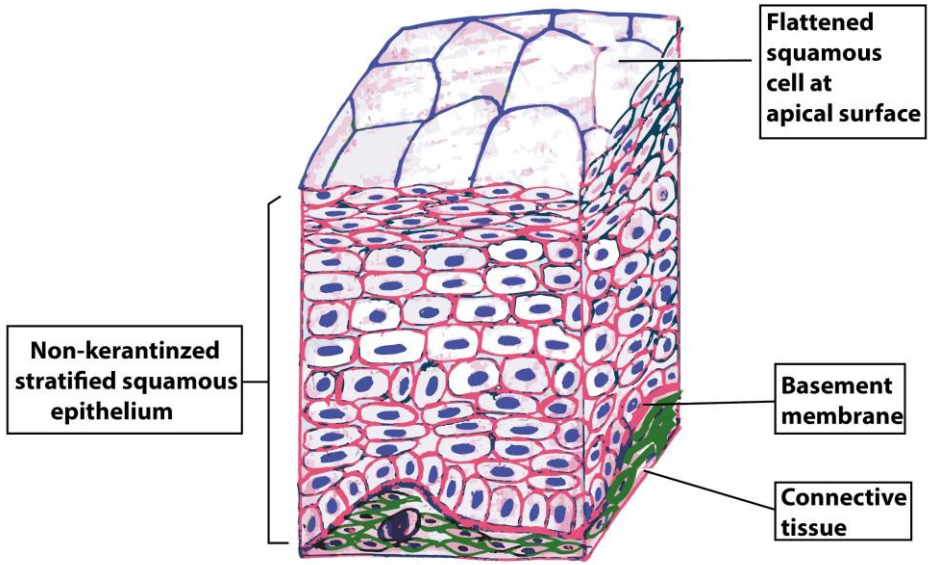
Pseudostratified Columnar Epithelium

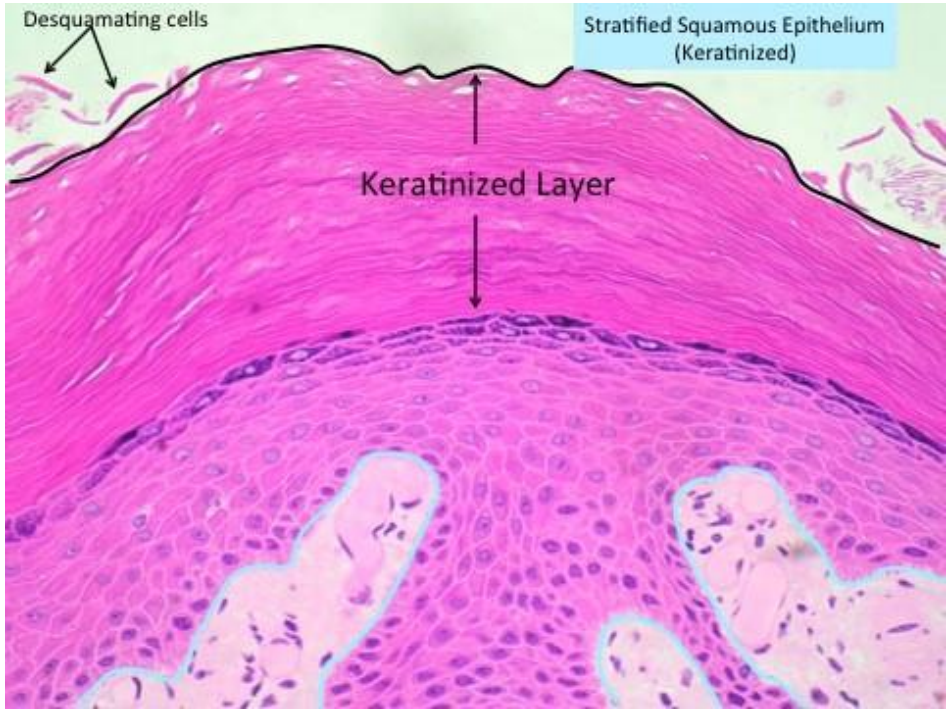
- **Structure:** Single layer of cells with nuclei at different heights, giving a stratified appearance.
- **Location:** Respiratory tract (trachea, bronchi).
- **Function:** Secretion of mucus; cilia move mucus and trapped particles



Stratified Squamous Epithelium

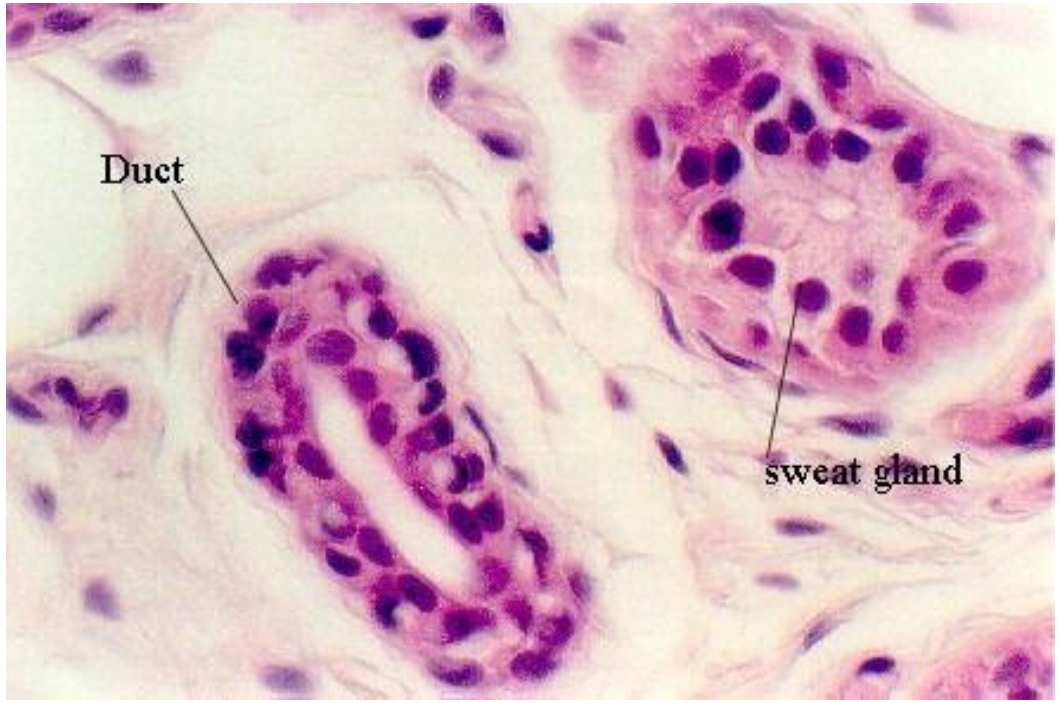
- **Structure:** Multiple layers of flat cells; surface cells are squamous.
- **Location:** Skin (keratinized), mouth, esophagus, vagina (non-keratinized).
- **Function:** Protection against abrasion and pathogens.





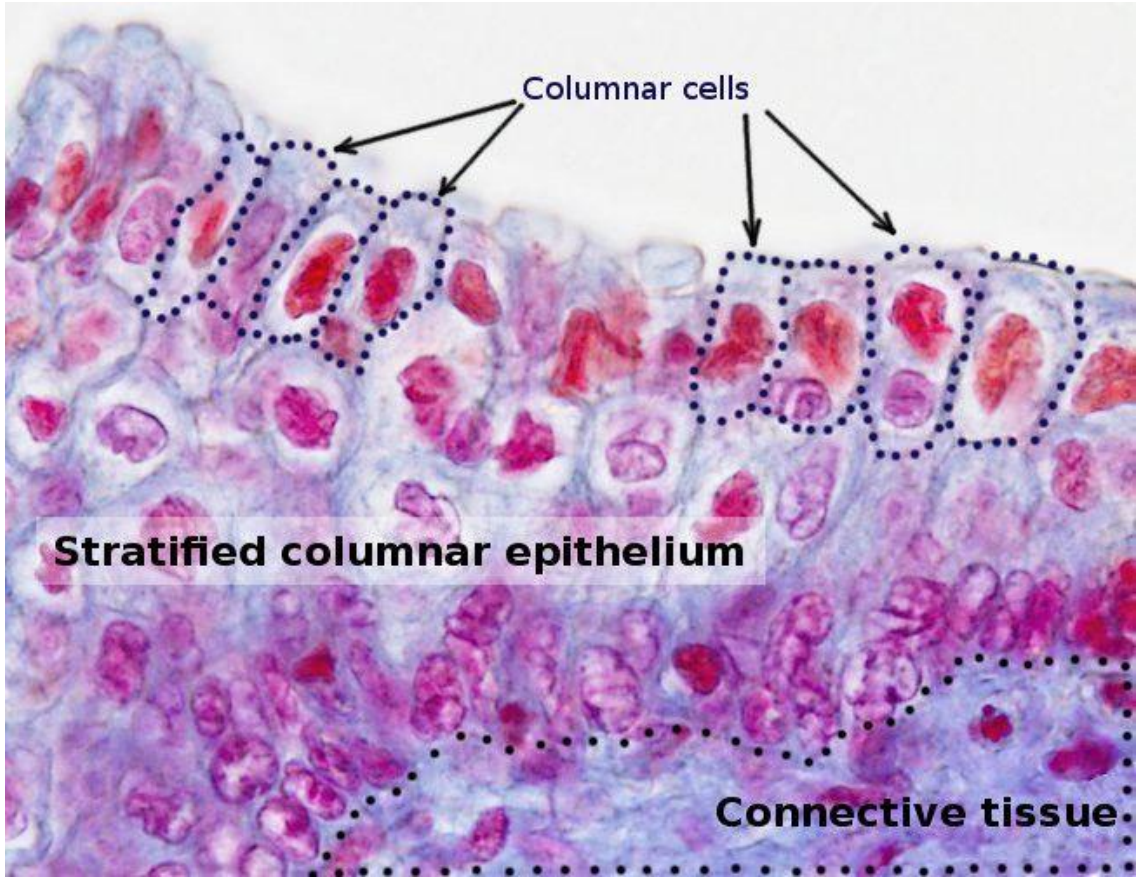
Stratified Cuboidal Epithelium

- **Structure:** Two or more layers of cube-shaped cells.
- **Location:** Sweat glands, salivary glands, mammary glands.
- **Function:** Protection and secretion.



Stratified Columnar Epithelium

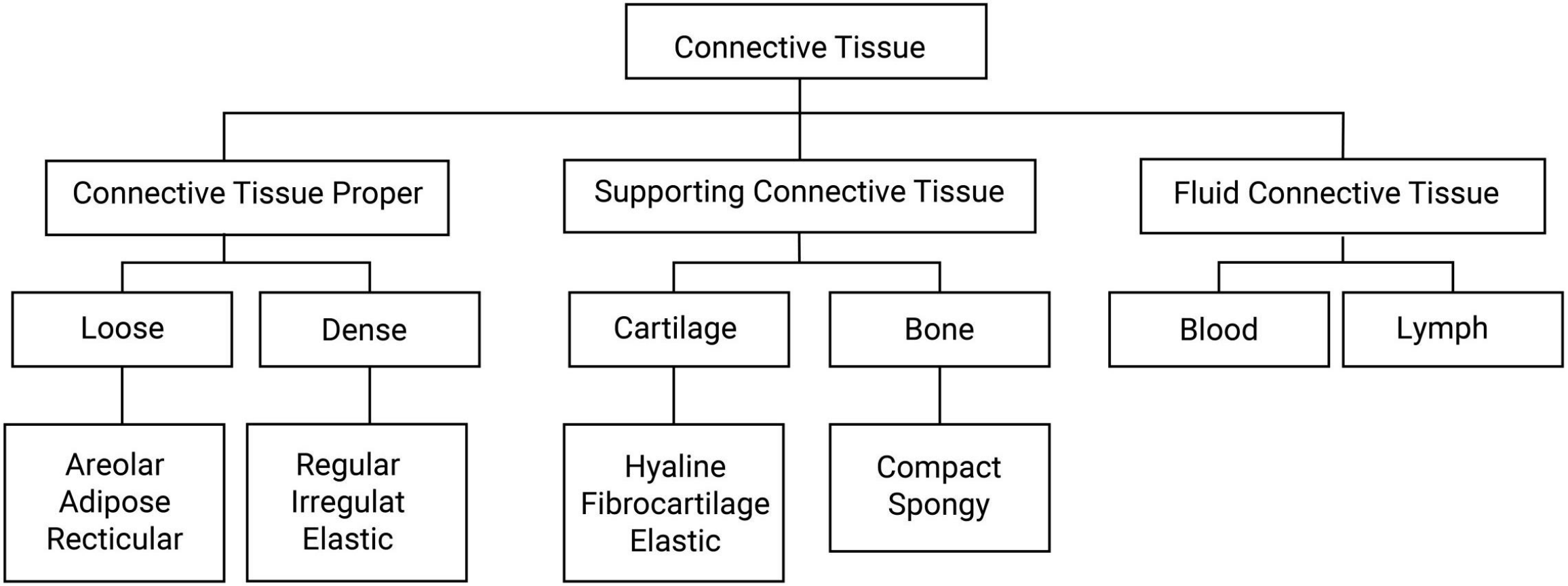
- **Structure:** Multiple layers of columnar cells.
- **Location:** Male urethra, ducts of some glands.
- **Function:** Secretion and protection



Transitional Epithelium

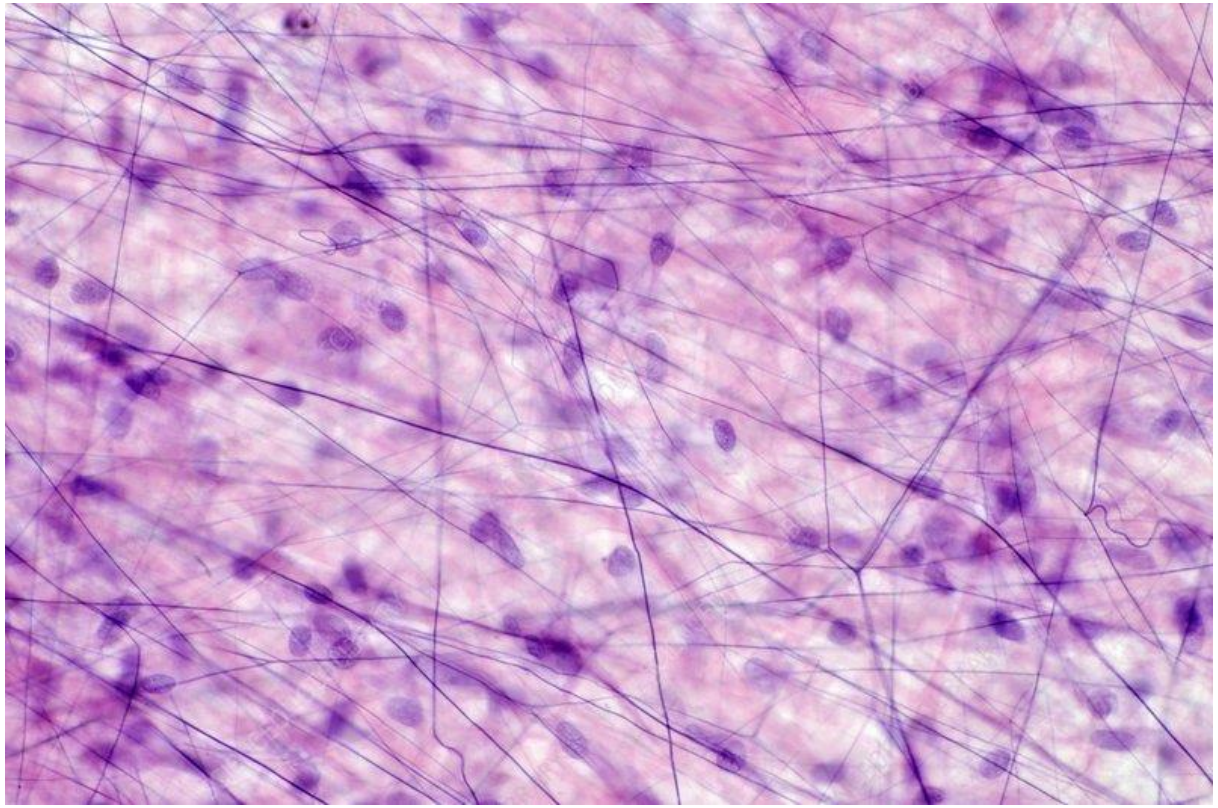
- **Structure:** Multiple layers of cells that can change shape (stretchable).
- **Location:** Urinary bladder, ureters, urethra.
- **Function:** Allows stretching and protection of urinary organs.

Classification of Connective Tissue



Functions of Connective Tissue

- **Structural Framework** for internal interconnecting of cells
- **Protection** – Insulates vital organs (skull, rib cage, adipose)
- **Storage within Body** – Adipose stores energy
- **Transportation** – Blood and lymph fluids transport material through the body.
- **Repair and Healing**



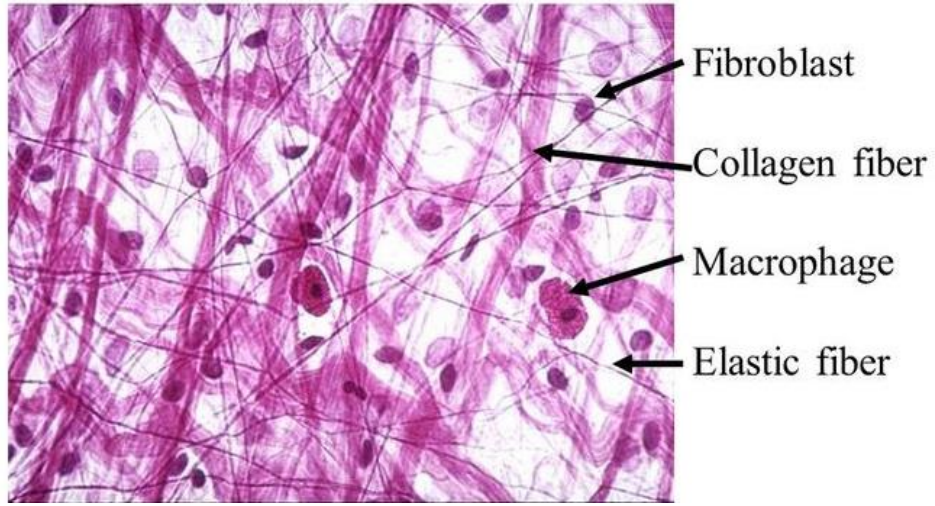
Location of Connective Tissue

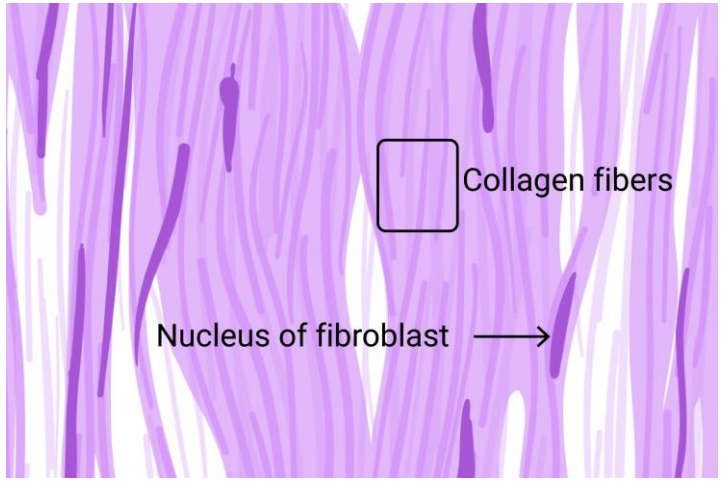
Loose

1) Areolar - Papillary region of dermis, around blood vessels.
2) Adipose – Hypodermis
3) Reticular - Spleen, lymph node, capsule of liver

Dense

1) Regular – Tendons, ligaments.
2) Irregular – Joint capsules
3) Elastic –walls of arteries

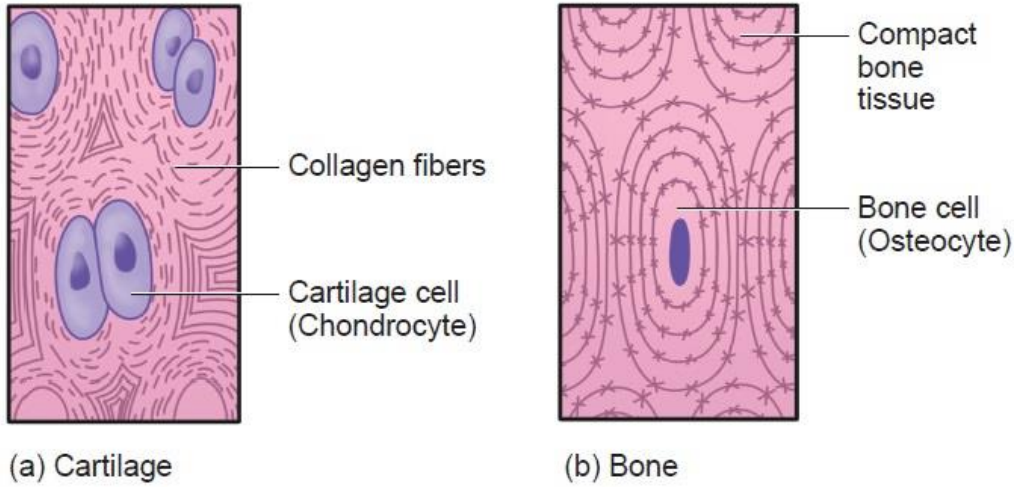




Location of Connective Tissue

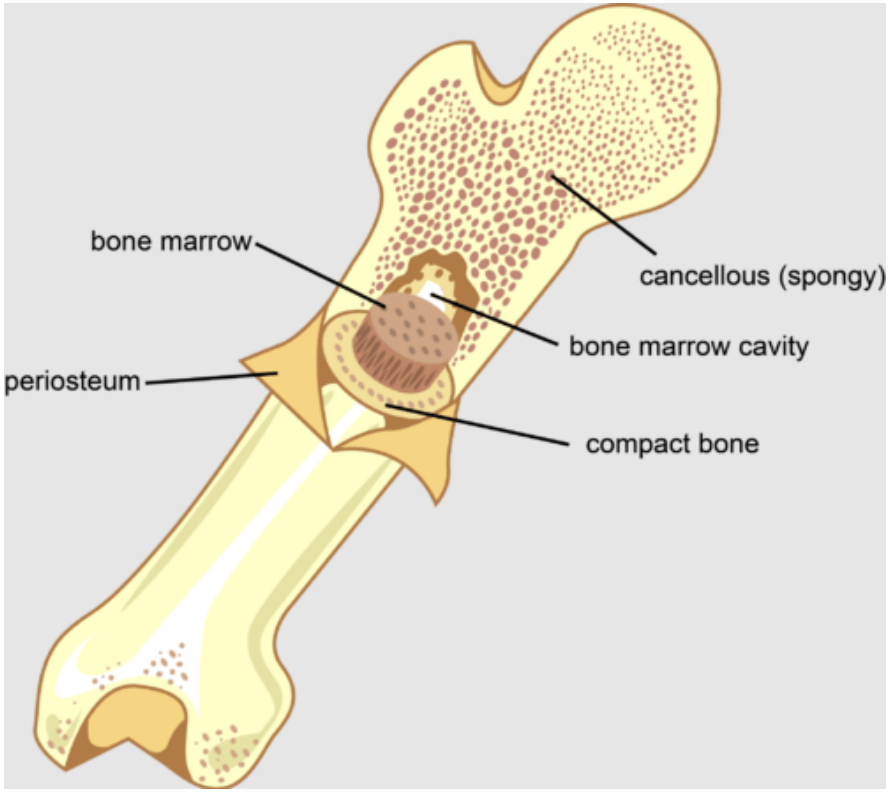
Cartilage

1) Hyaline – nose, trachea, larynx, Costal cartilage
2) Elastic – epiglottis, external ear.
3) Fibrocartilage – intervertebral disc, pubic symphysis.



Bone

1) Spongy – inner portion.
2) Compact – outer portion.



Summary Table

Type	Structure	Location	Function
Simple Squamous	Flat, single	Vessels, alveoli	Diffusion
Simple Cuboidal	Cube, single	Kidney, glands	Secretion
Simple Columnar	Tall, single	Gut, tubes	Absorption
Stratified Squamous	Flat, multi	Skin, mouth	Protection
Pseudostratified	Tall, single	Respiratory	Secretion
Transitional	Variable	Bladder	Stretch

References

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THANK YOU