

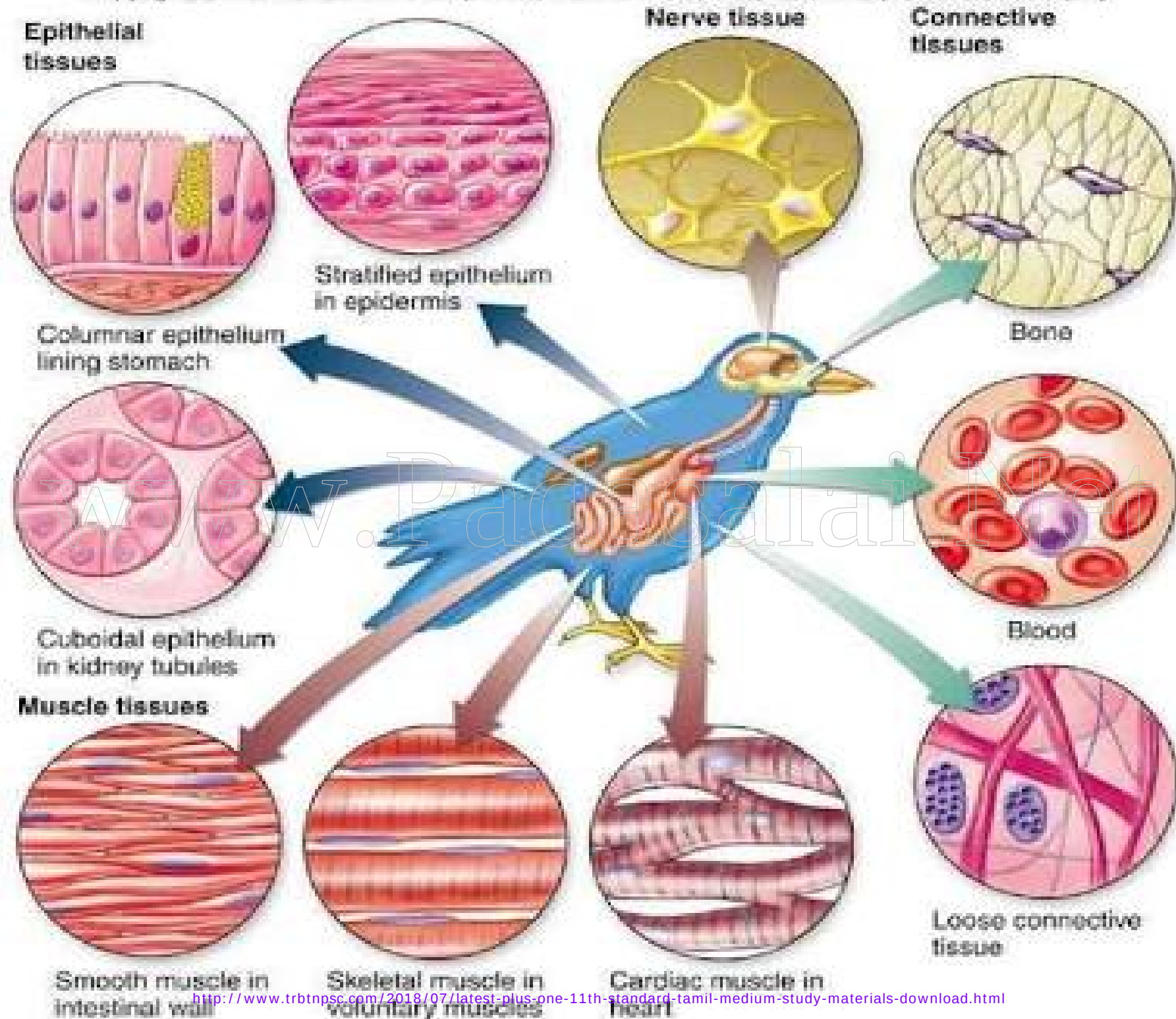
# திசு அளவிலான கட்டமைப்பு

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சு.தியாகராஜன்  
முதுகலை உயிரியல் ஆசிரியர்  
அரசு மேல்நிலைப்பள்ளி கோமங்கலம்புதூர்  
பொள்ளாச்சி கோயம்புத்தூர் மாவட்டம்

# பாட உள்ளடக்கம்

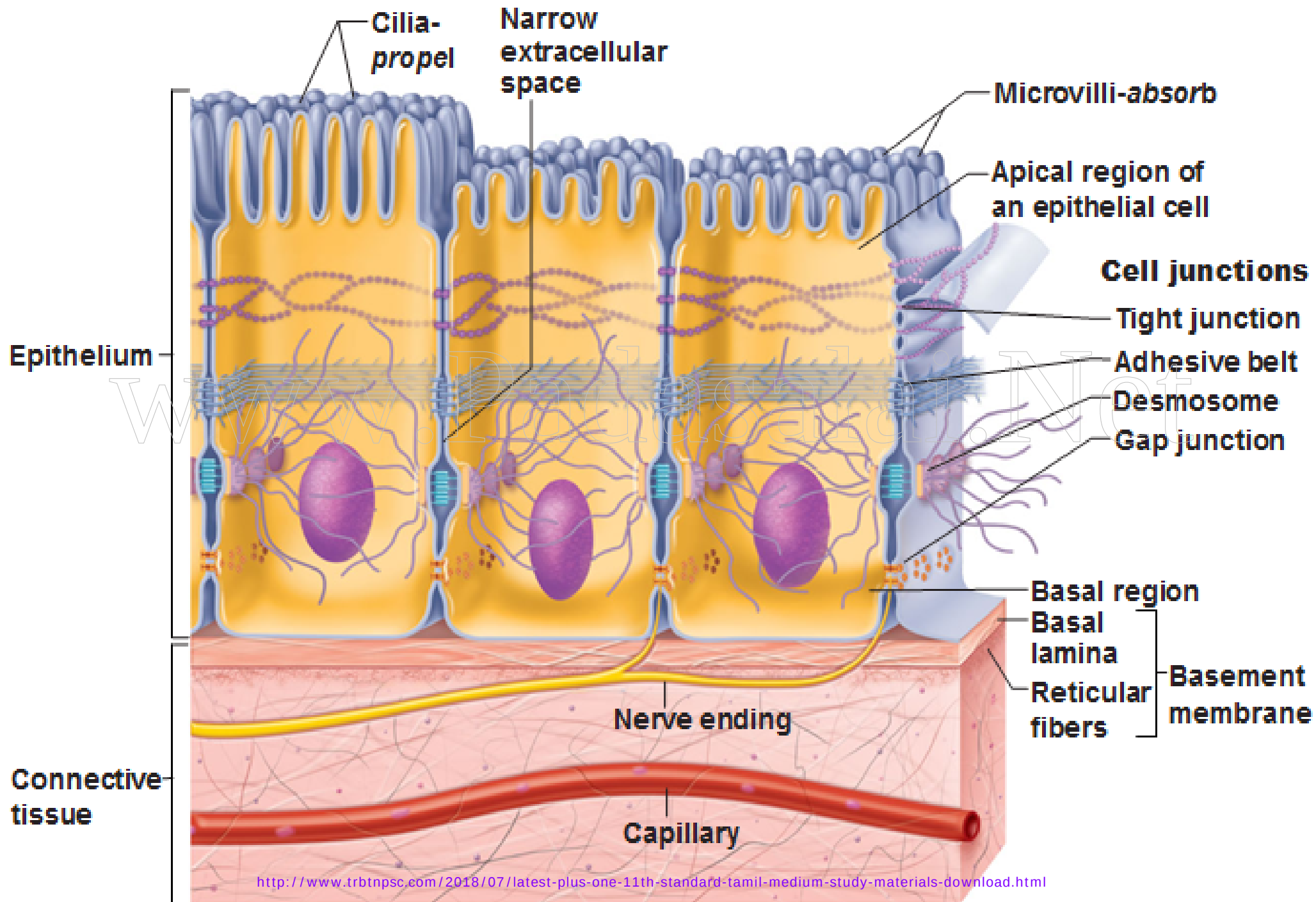
- விலங்கு திசுக்கள்
- எபிதீலியத் திசுக்கள்
- இணைப்புத் திசுக்கள்
- தசை திசு
- நரம்புத் திசு



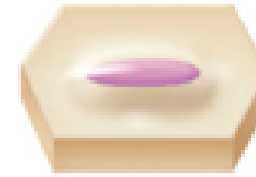
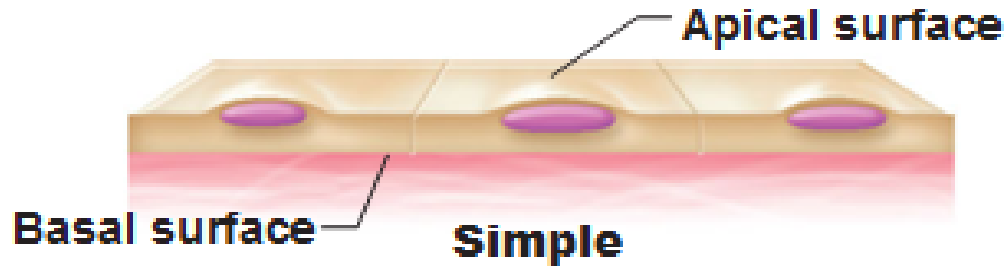
# எபிதீலியத் திசு

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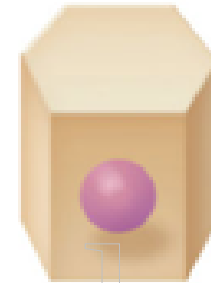
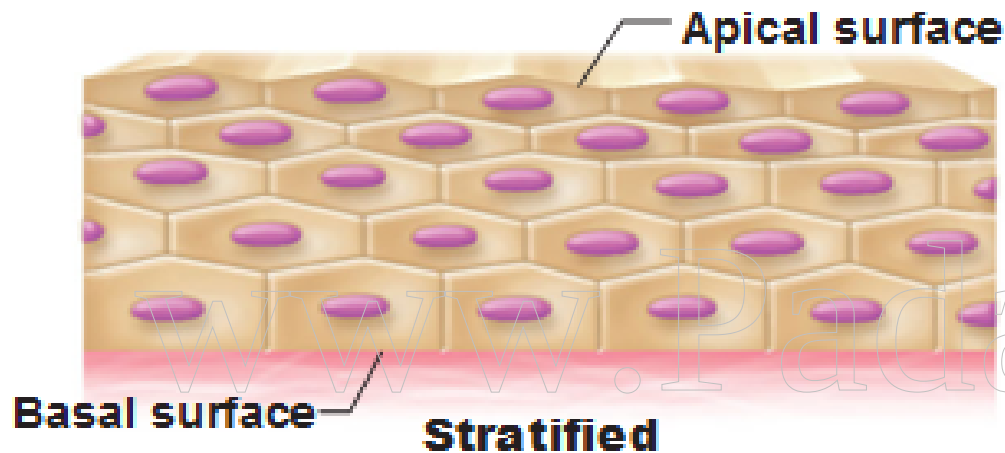
# Special Characteristics of Epithelia



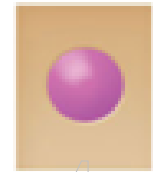
# Classifications of Epithelia



**Squamous**

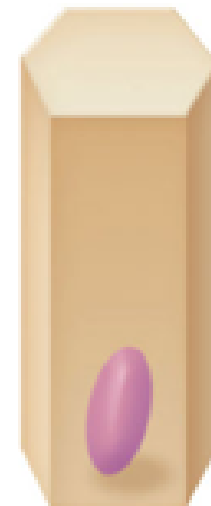


**Cuboidal**



## (a) Classification based on number of cell layers

**Note that basal cells regenerate; as apical cells slough off, they are replaced by basal cells**



**Columnar**



## (b) Classification based on cell shape

# Simple Squamous Epithelium

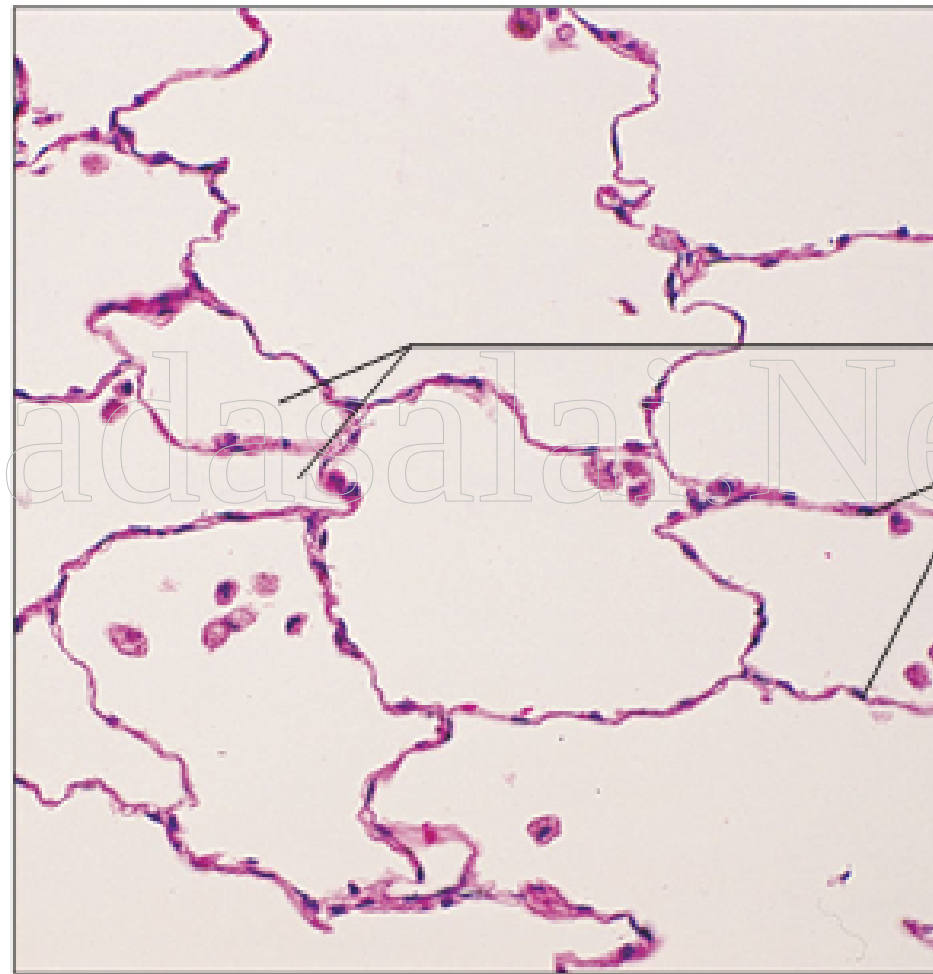
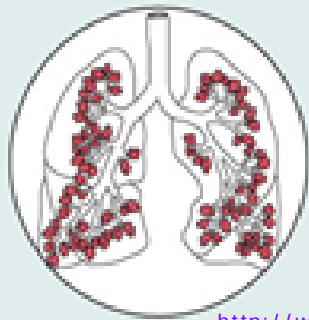
## (a) Simple squamous epithelium

**Description:** Single layer of flattened cells with disc-shaped central nuclei and sparse cytoplasm; the simplest of the epithelia.



**Function:** Allows passage of materials by diffusion and filtration in sites where protection is not important; secretes lubricating substances in serosae.

**Location:** Kidney glomeruli; air sacs of lungs; lining of heart, blood vessels, and lymphatic vessels; lining of ventral body cavity (serosae).



Air sacs of lung tissue

Nuclei of squamous epithelial cells

**Photomicrograph:** Simple squamous epithelium forming part of the alveolar (air sac) walls (200 $\times$ ).

# Simple Cuboidal Epithelium

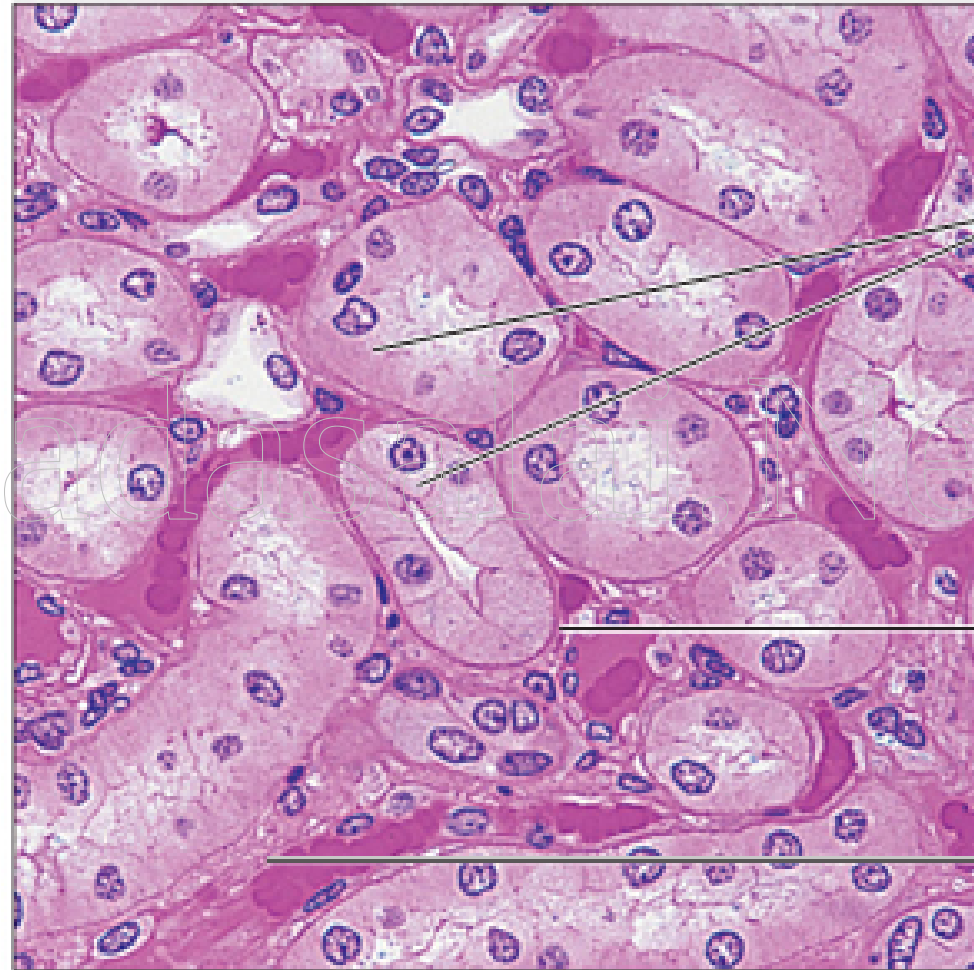
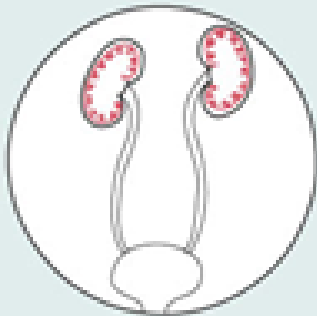
## (b) Simple cuboidal epithelium

**Description:** Single layer of cubelike cells with large, spherical central nuclei.



**Function:** Secretion and absorption.

**Location:** Kidney tubules; ducts and secretory portions of small glands; ovary surface.



Simple cuboidal epithelial cells

Basement membrane

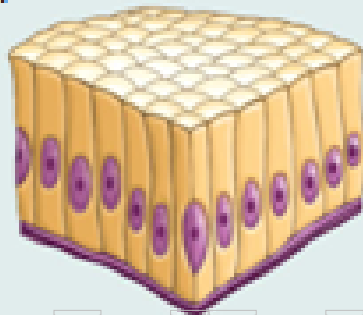
Connective tissue

**Photomicrograph:** Simple cuboidal epithelium in kidney tubules (430 $\times$ ).

# Simple Columnar Epithelium

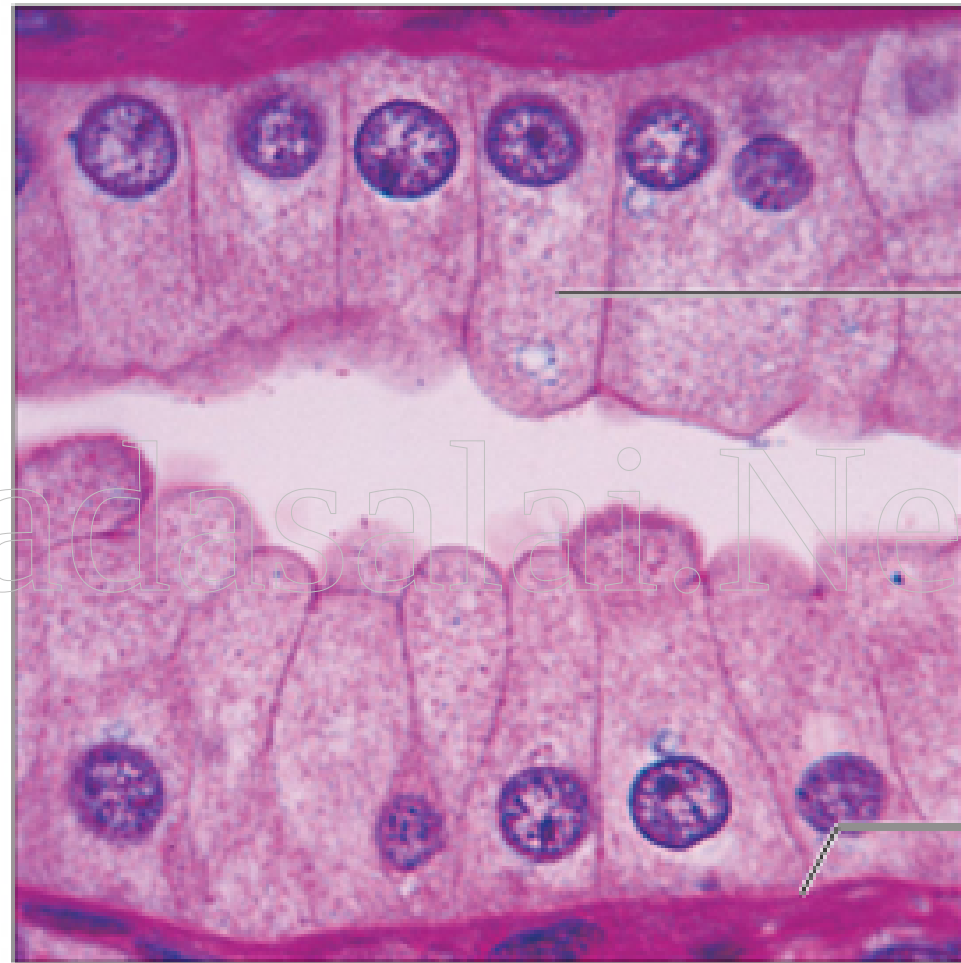
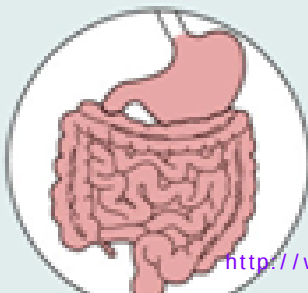
## (c) Simple columnar epithelium

**Description:** Single layer of tall cells with round to oval nuclei; some cells bear cilia; layer may contain mucus-secreting unicellular glands (goblet cells).



**Function:** Absorption; secretion of mucus, enzymes, and other substances; ciliated type propels mucus (or reproductive cells) by ciliary action.

**Location:** Nonciliated type lines most of the digestive tract (stomach to anal canal), gallbladder, and excretory ducts of some glands; ciliated variety lines small bronchi, uterine tubes, and some regions of the uterus.



Simple columnar epithelial cell

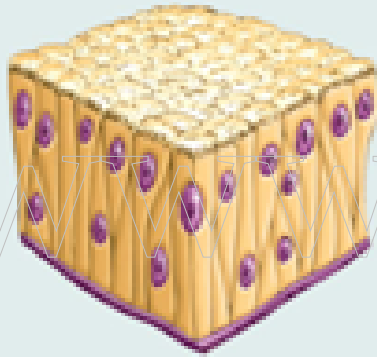
Basement membrane

**Photomicrograph:** Simple columnar epithelium of the stomach mucosa (1150 $\times$ ).

# Pseudostratified Ciliated Columnar Epithelium

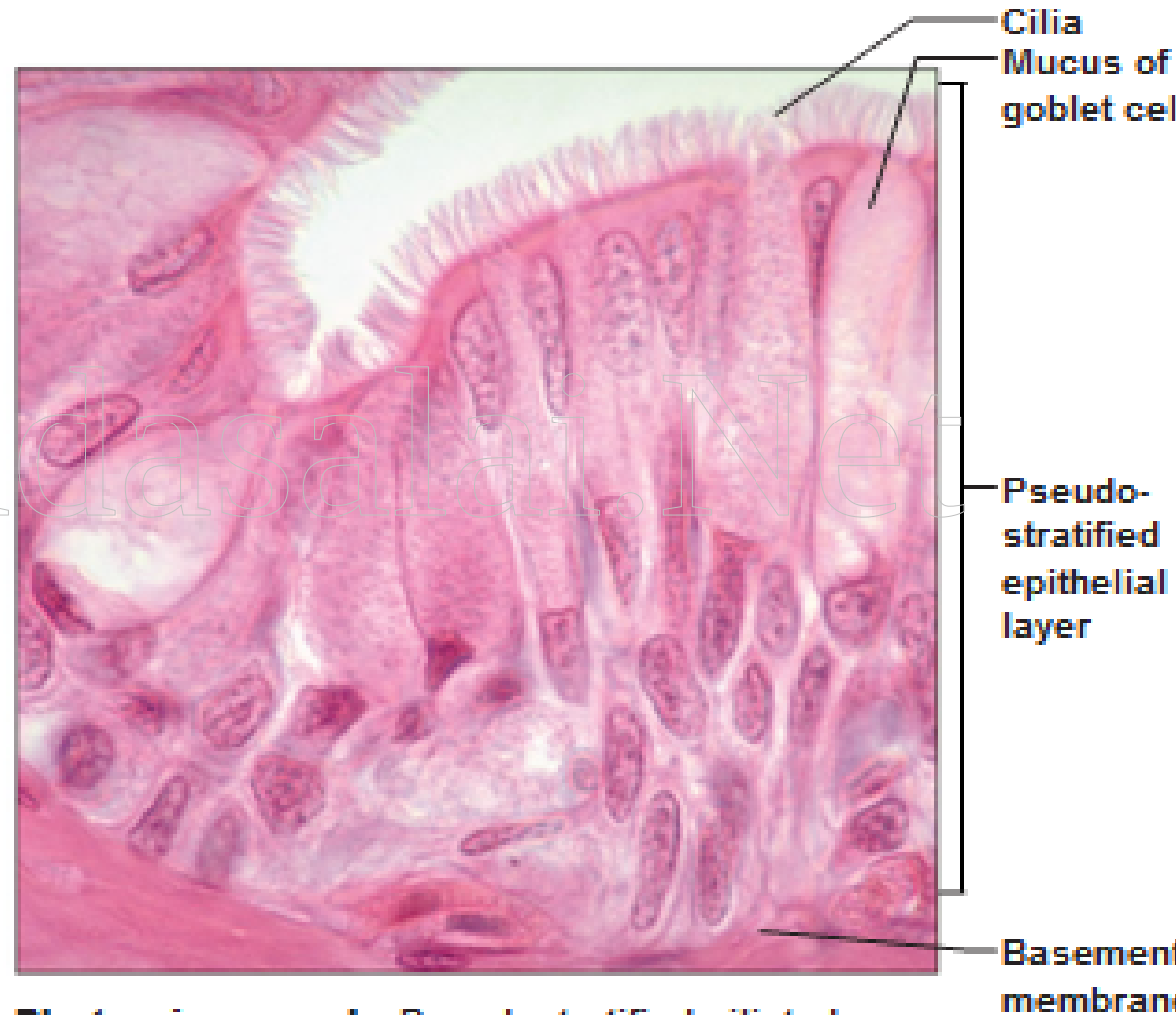
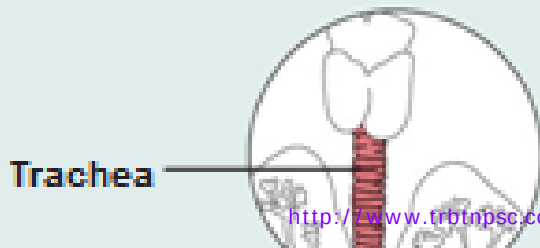
## (d) Pseudostratified columnar epithelium

**Description:** Single layer of cells of differing heights, some not reaching the free surface; nuclei seen at different levels; may contain mucus-secreting goblet cells and bear cilia.



**Function:** Secretion, particularly of mucus; propulsion of mucus by ciliary action.

**Location:** Nonciliated type in male's sperm-carrying ducts and ducts of large glands; ciliated variety lines the trachea, most of the upper respiratory tract.

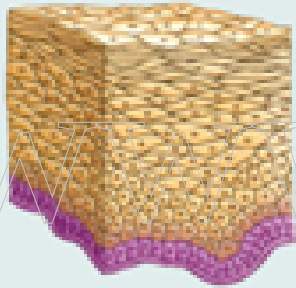


**Photomicrograph:** Pseudostratified ciliated columnar epithelium lining the human trachea (780 $\times$ ).

# Stratified Squamous Epithelium

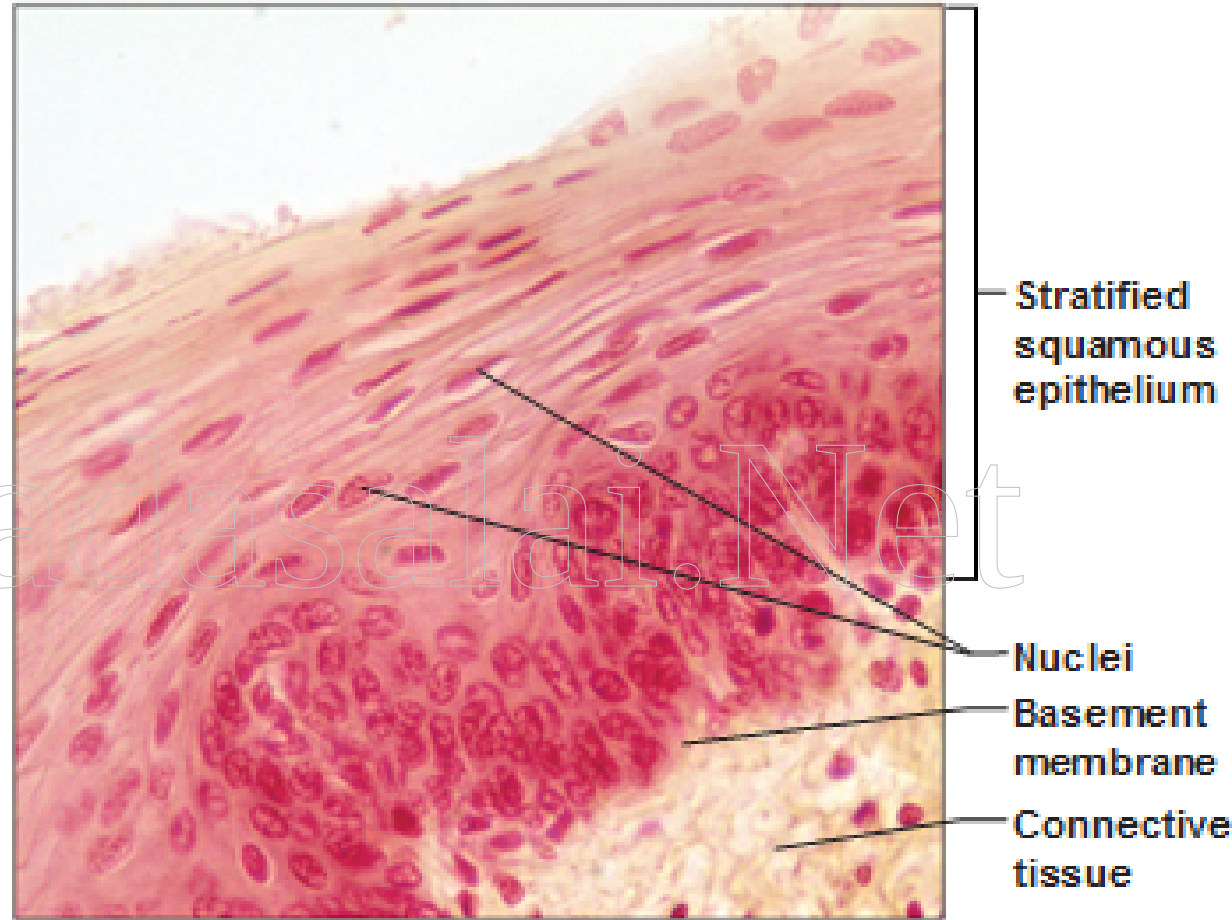
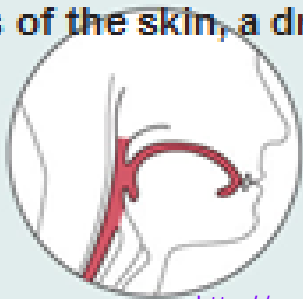
## (e) Stratified squamous epithelium

**Description:** Thick membrane composed of several cell layers; basal cells are cuboidal or columnar and metabolically active; surface cells are flattened (squamous); in the keratinized type, the surface cells are full of keratin and dead; basal cells are active in mitosis and produce the cells of the more superficial layers.



**Function:** Protects underlying tissues in areas subjected to abrasion.

**Location:** Nonkeratinized type forms the moist linings of the esophagus, mouth, and vagina, urethra and anus; keratinized variety forms the epidermis of the skin, a dry membrane.

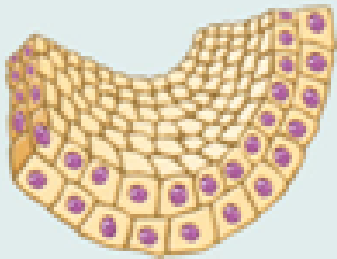


**Photomicrograph:** Stratified squamous epithelium lining the esophagus (430×).

# Stratified *Cuboidal* Epithelium

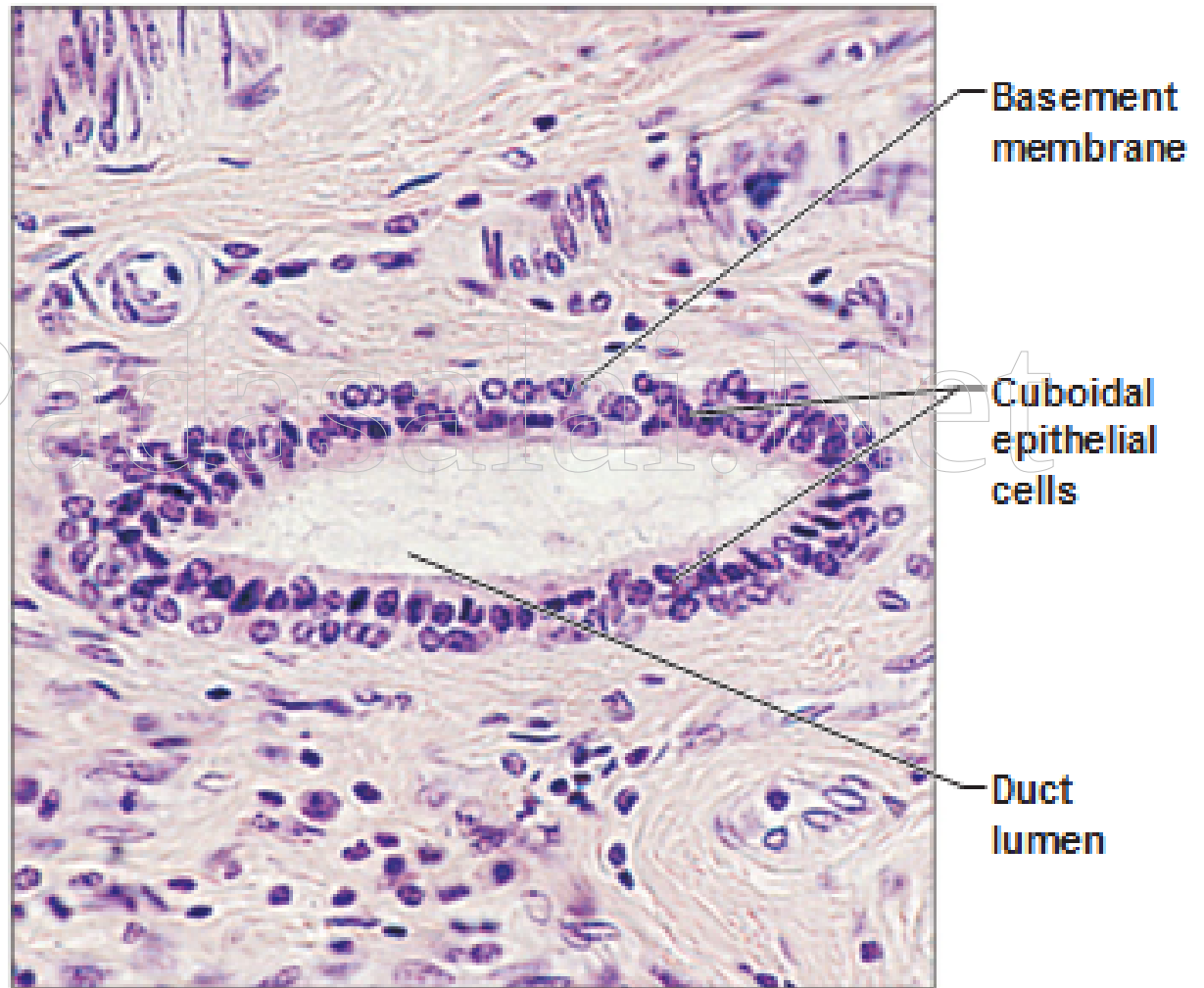
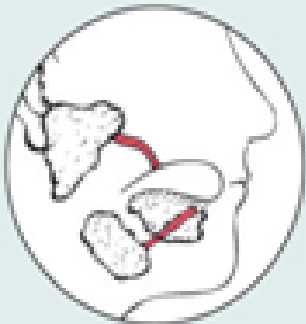
## (f) Stratified cuboidal epithelium

**Description:** Generally two layers of cubelike cells.



**Function:** Protection

**Location:** Largest ducts of sweat glands, mammary glands, and salivary glands.

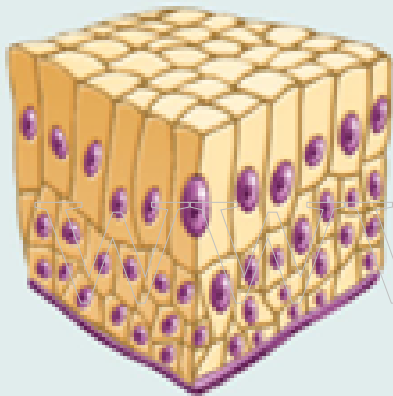


**Photomicrograph:** Stratified cuboidal epithelium forming a salivary gland duct (285x).

# Stratified Columnar Epithelium

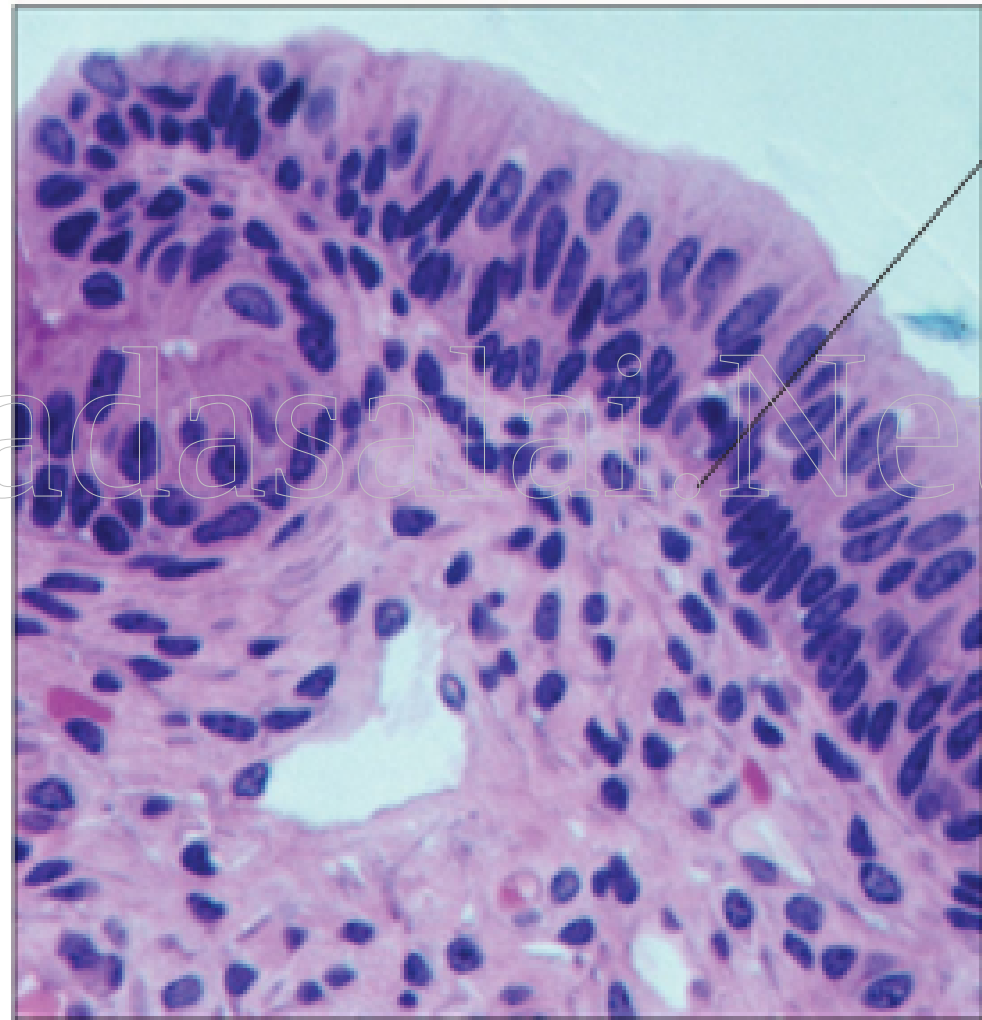
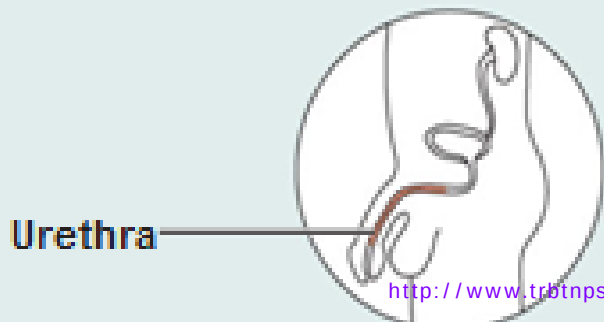
## (g) Stratified columnar epithelium

**Description:** Several cell layers; basal cells usually cuboidal; superficial cells elongated and columnar.



**Function:** Protection; secretion.

**Location:** Rare in the body; small amounts in male urethra and in large ducts of some glands.



Basement  
membrane

Stratified  
columnar  
epithelium

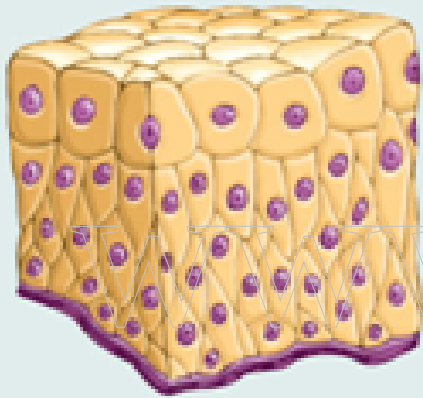
Underlying  
connective  
tissue

**Photomicrograph:** Stratified columnar epithelium lining of the male urethra (315 $\times$ ).

# Transitional Epithelium

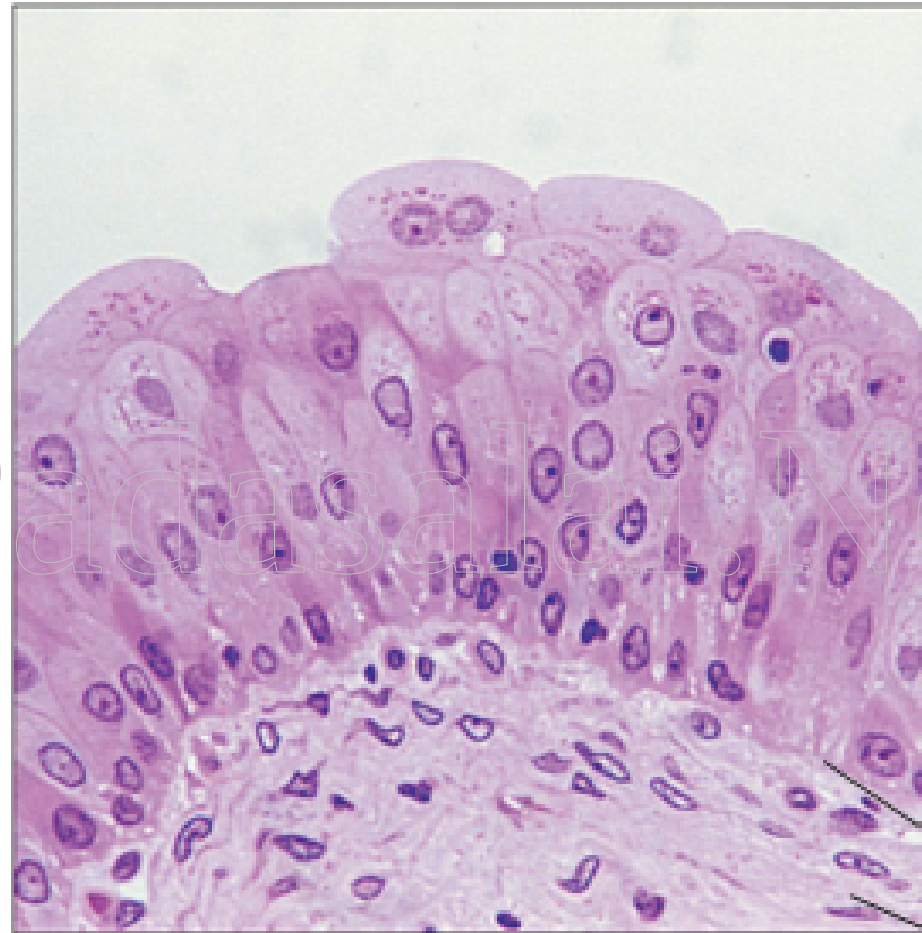
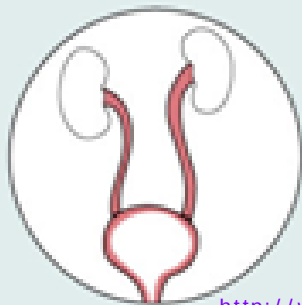
## (h) Transitional epithelium

**Description:** Resembles both stratified squamous and stratified cuboidal; basal cells cuboidal or columnar; surface cells dome shaped or squamous-like, depending on degree of organ stretch.



**Function:** Stretches readily and permits distension of urinary organ by contained urine.

**Location:** Lines the ureters, bladder, and part of the urethra.



Transitional epithelium

Basement membrane

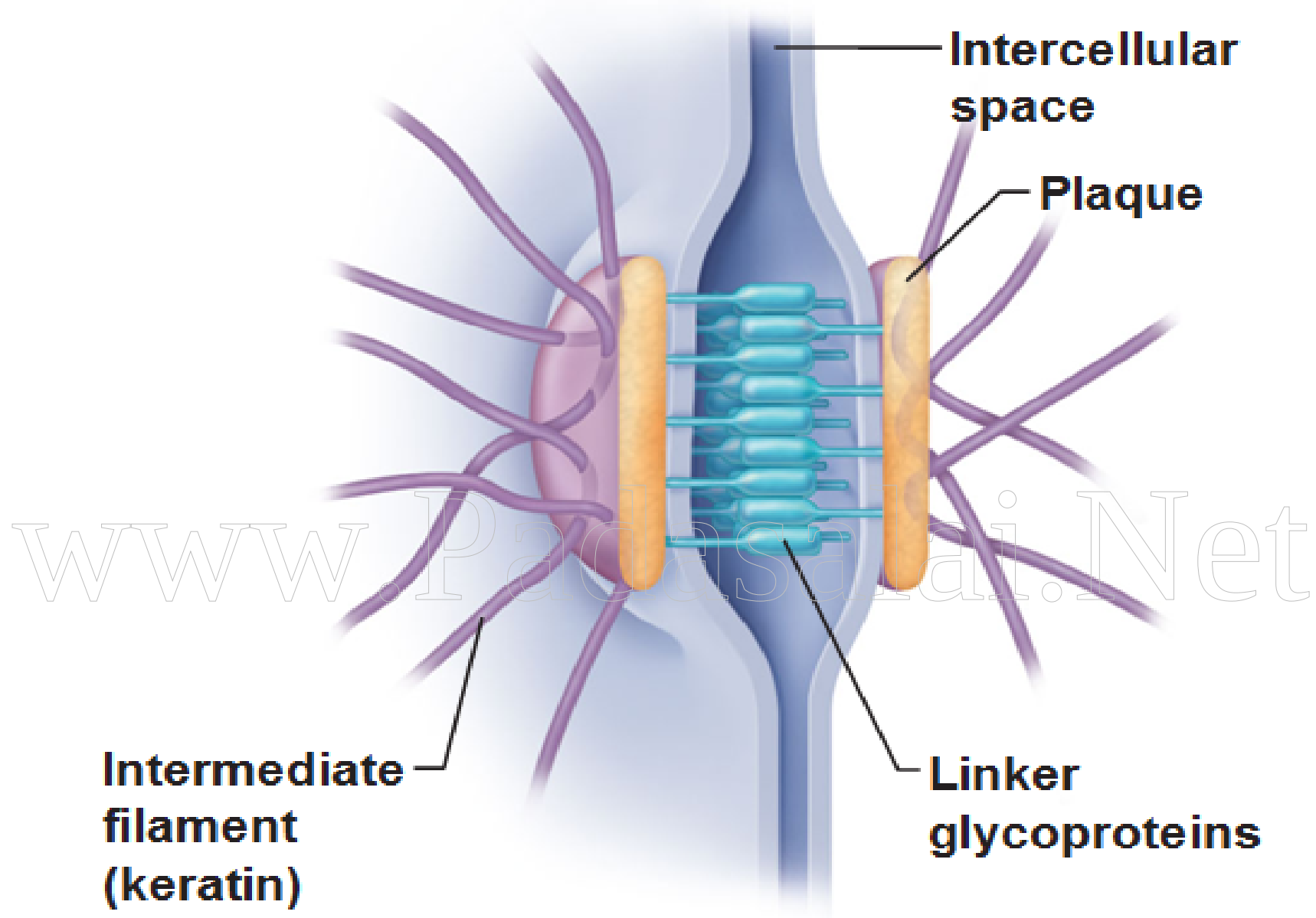
Connective tissue

**Photomicrograph:** Transitional epithelium lining the bladder, relaxed state (390×); note the bulbous, or rounded, appearance of the cells at the surface; these cells flatten and become elongated when the bladder is filled with urine.

# Desmosome

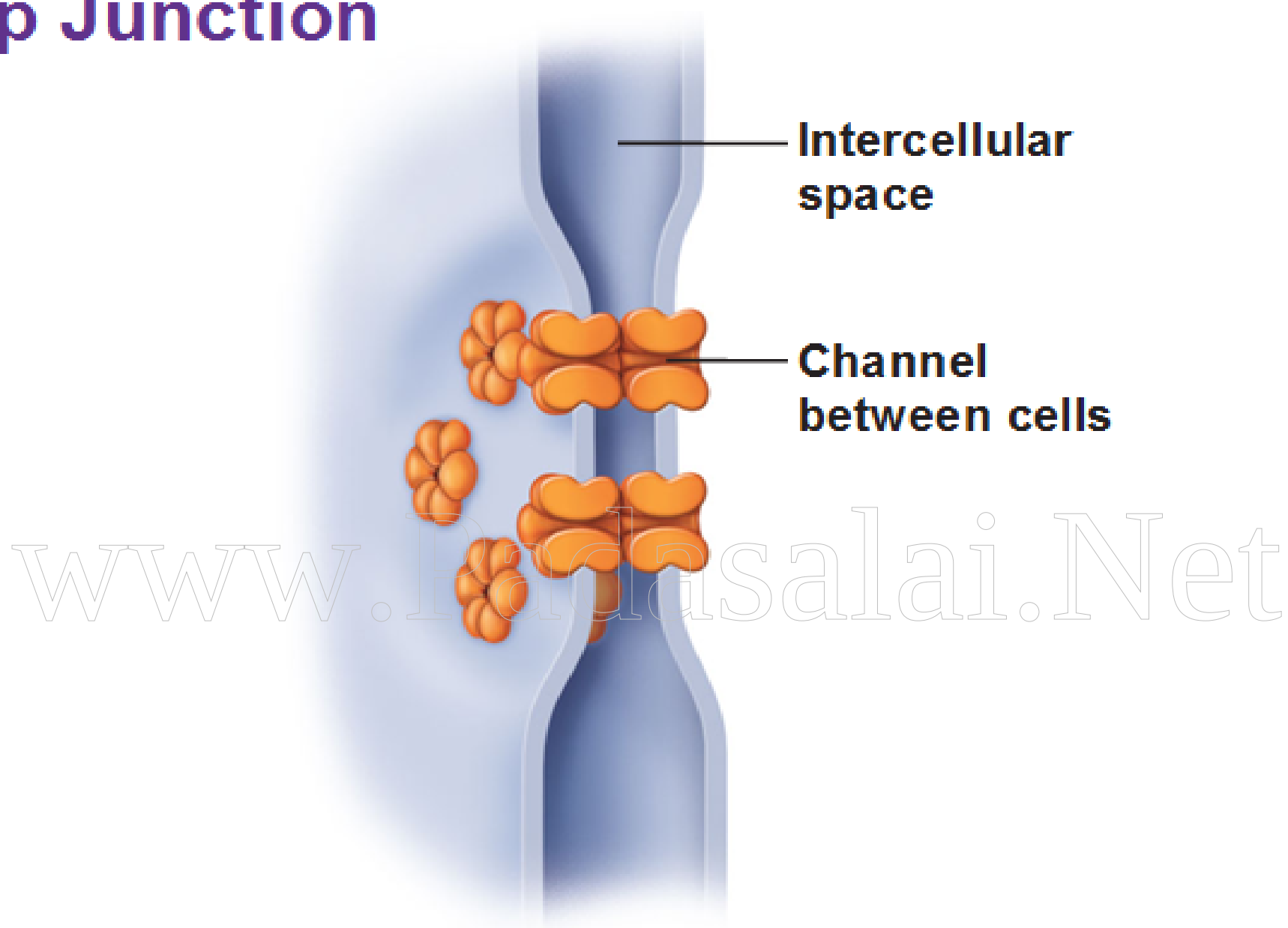
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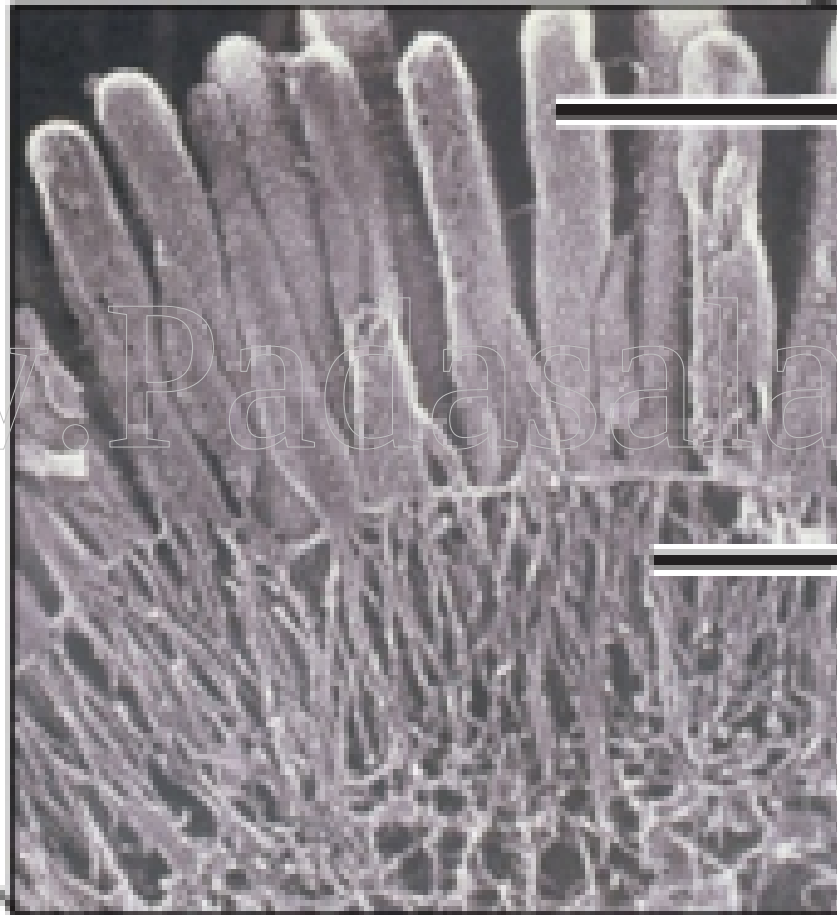
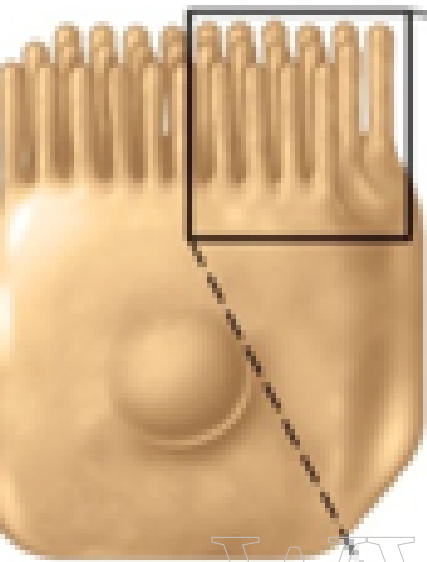


**(b) Desmosomes:** Anchoring junctions bind adjacent cells together and help form an internal tension-reducing network of fibers.

# Gap Junction

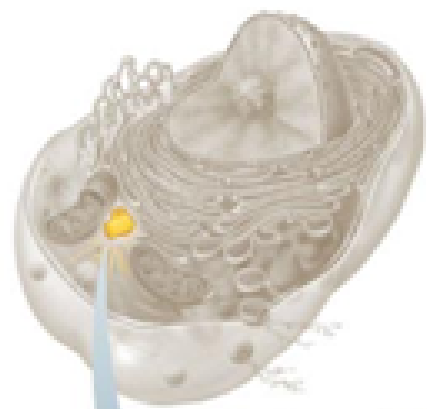


**(c) Gap junctions:** Communicating junctions allow ions and small molecules to pass from one cell to the next for intercellular communication.



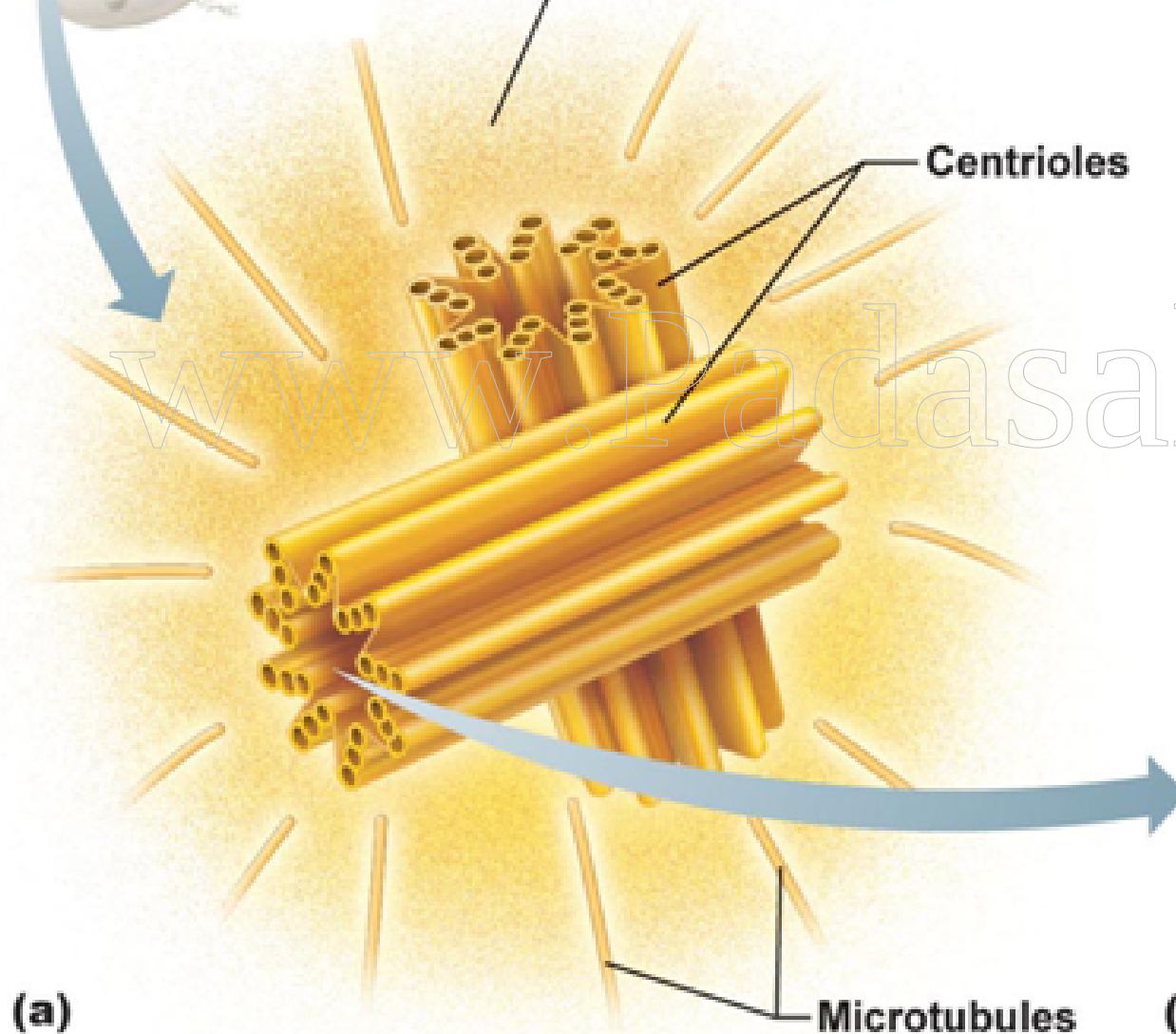
**Microvillus**

**Actin  
filaments**



**Centrosome matrix**

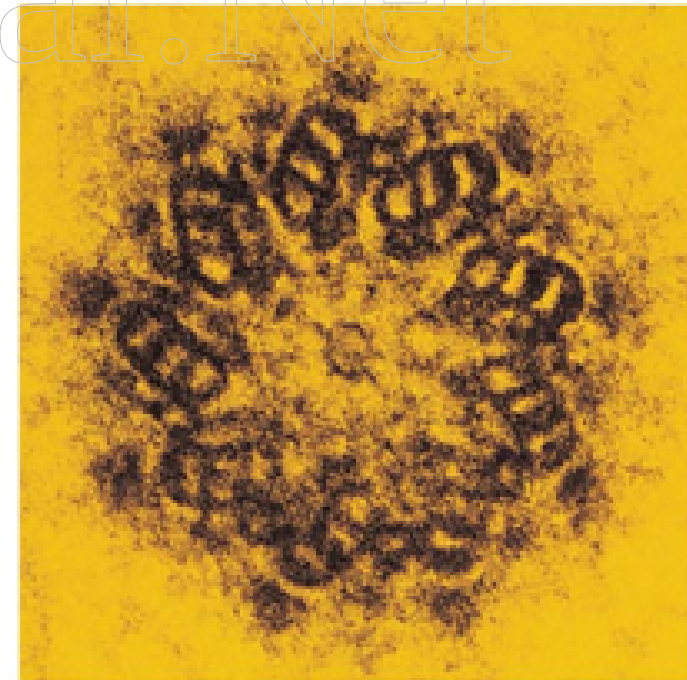
**Centrioles**



**(a)**

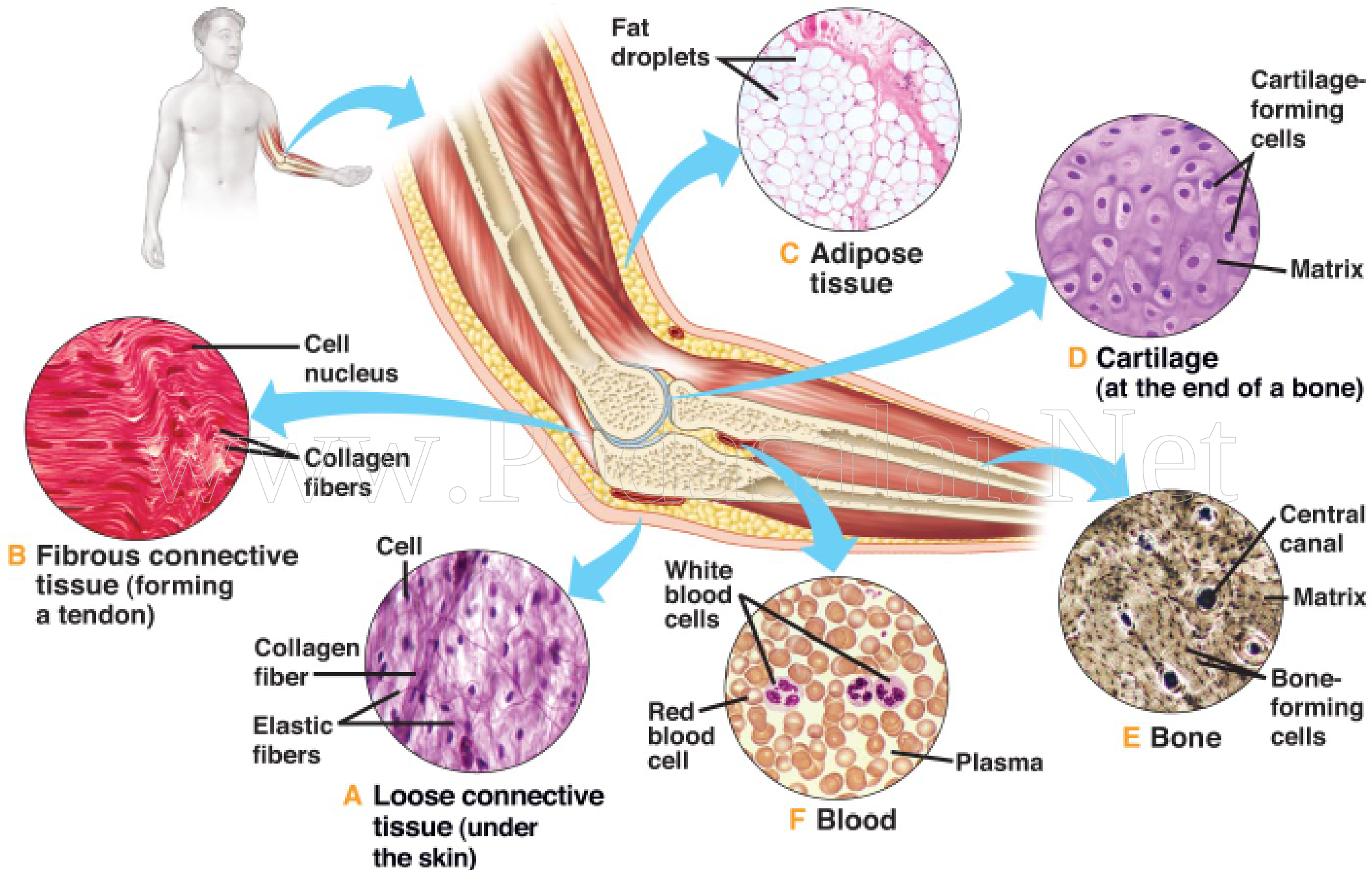
**Microtubules**

**(b)**



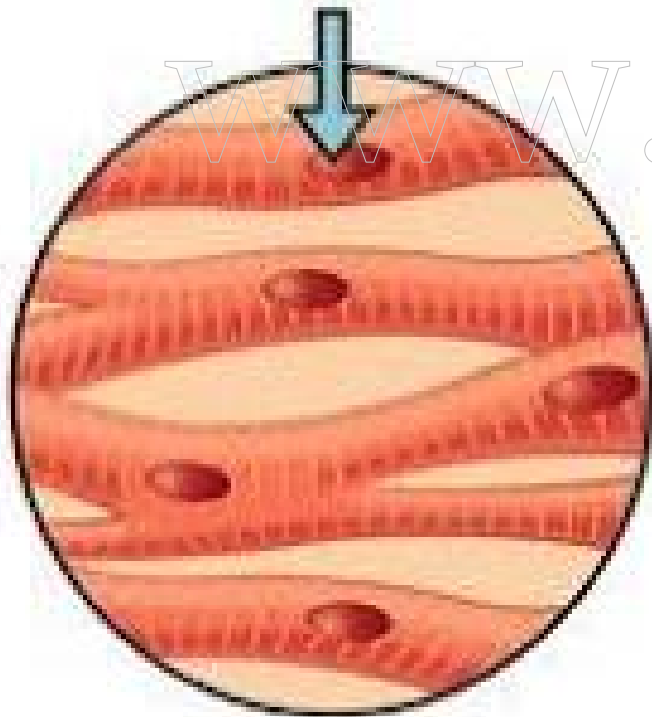
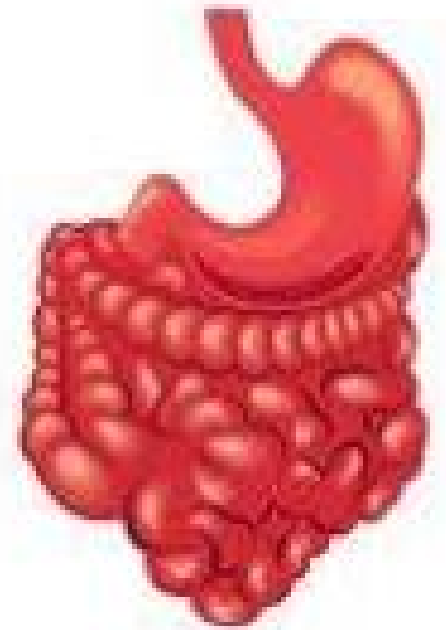
# இணைப்புத்திசு

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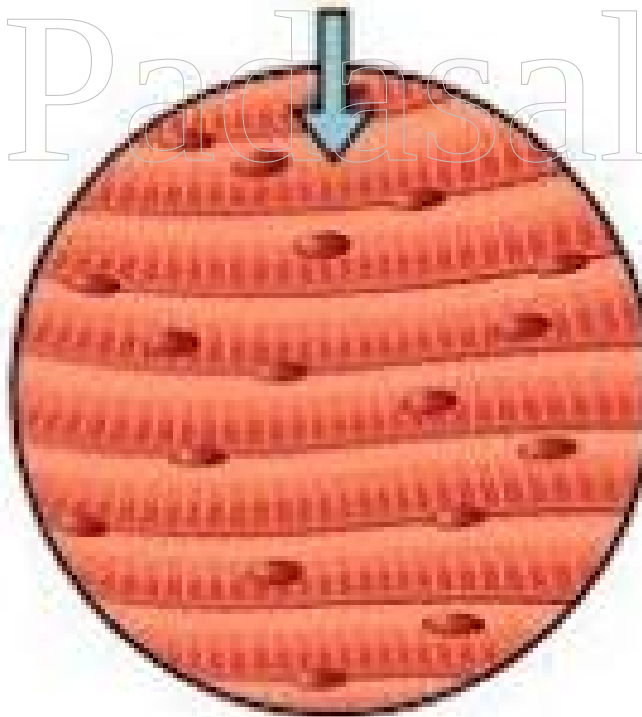


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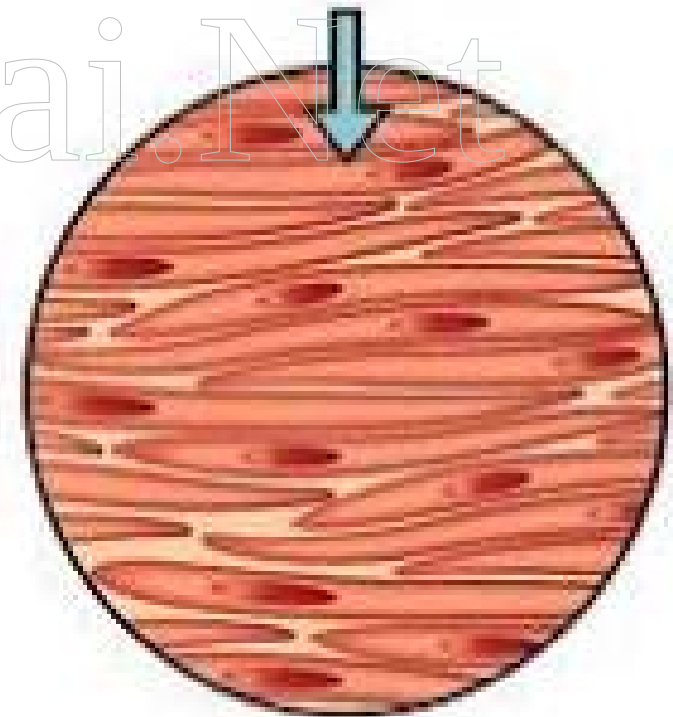
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**Cardiac muscle tissue**  
(Involuntary control)



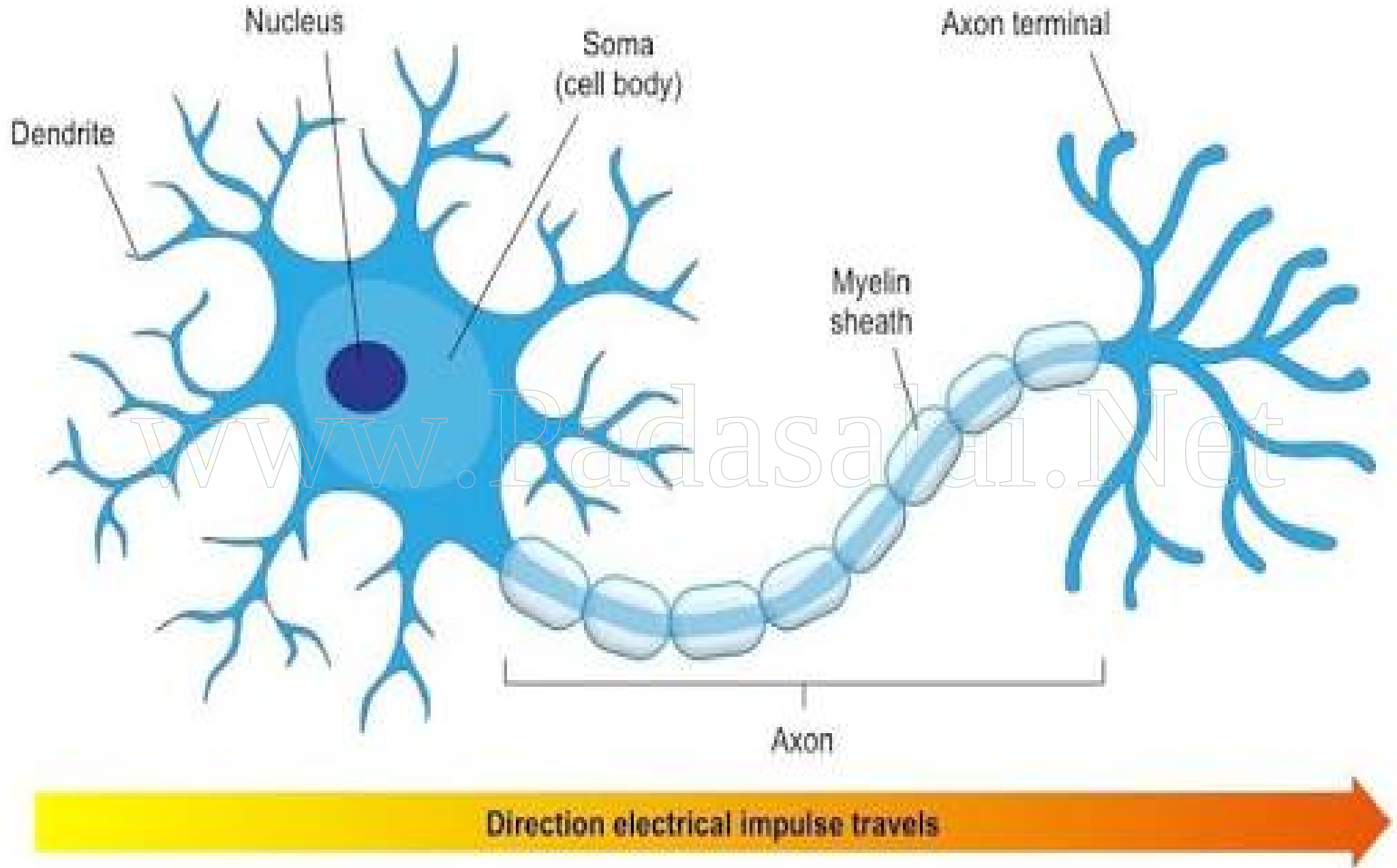
**Skeletal muscle tissue**  
(Voluntary control)



**Smooth muscle tissue**  
(Involuntary control)

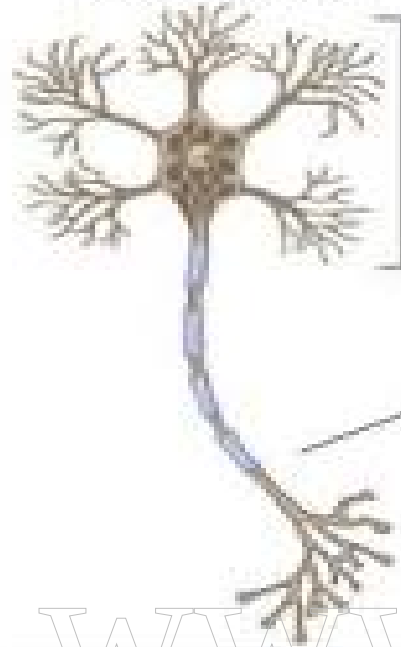
# நரம்புத் திசு

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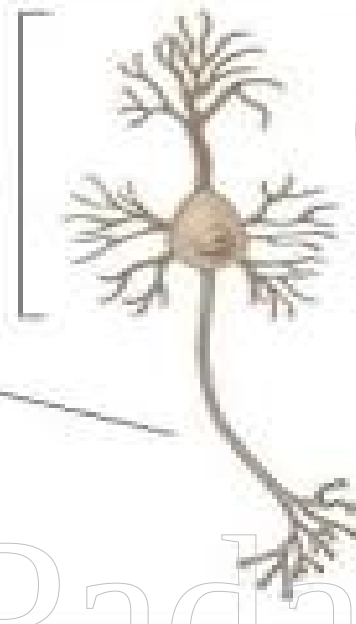


## Multipolar neurons

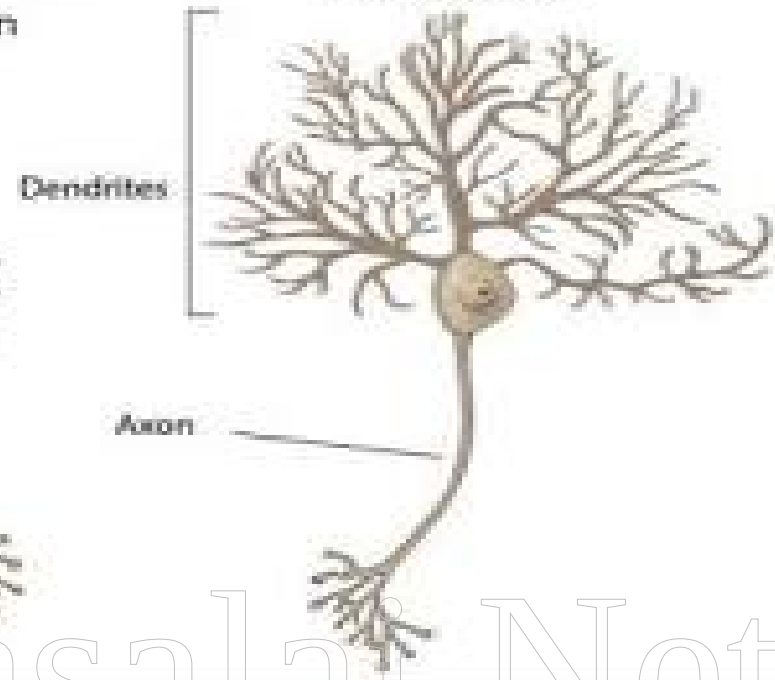
Motor neuron



Pyramidal neuron

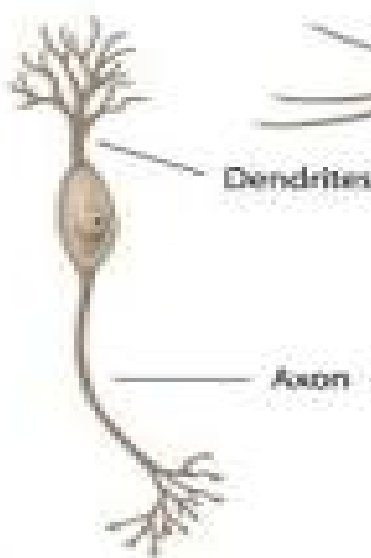


Purkinje cell

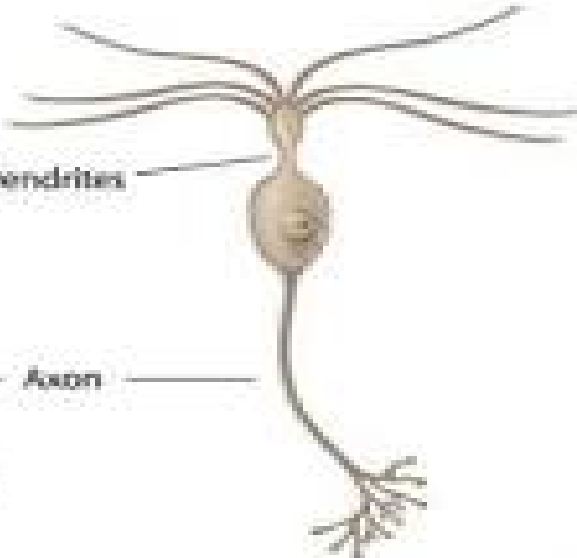


## Bipolar neurons

Retinal neuron



Olfactory neuron



## Unipolar neuron

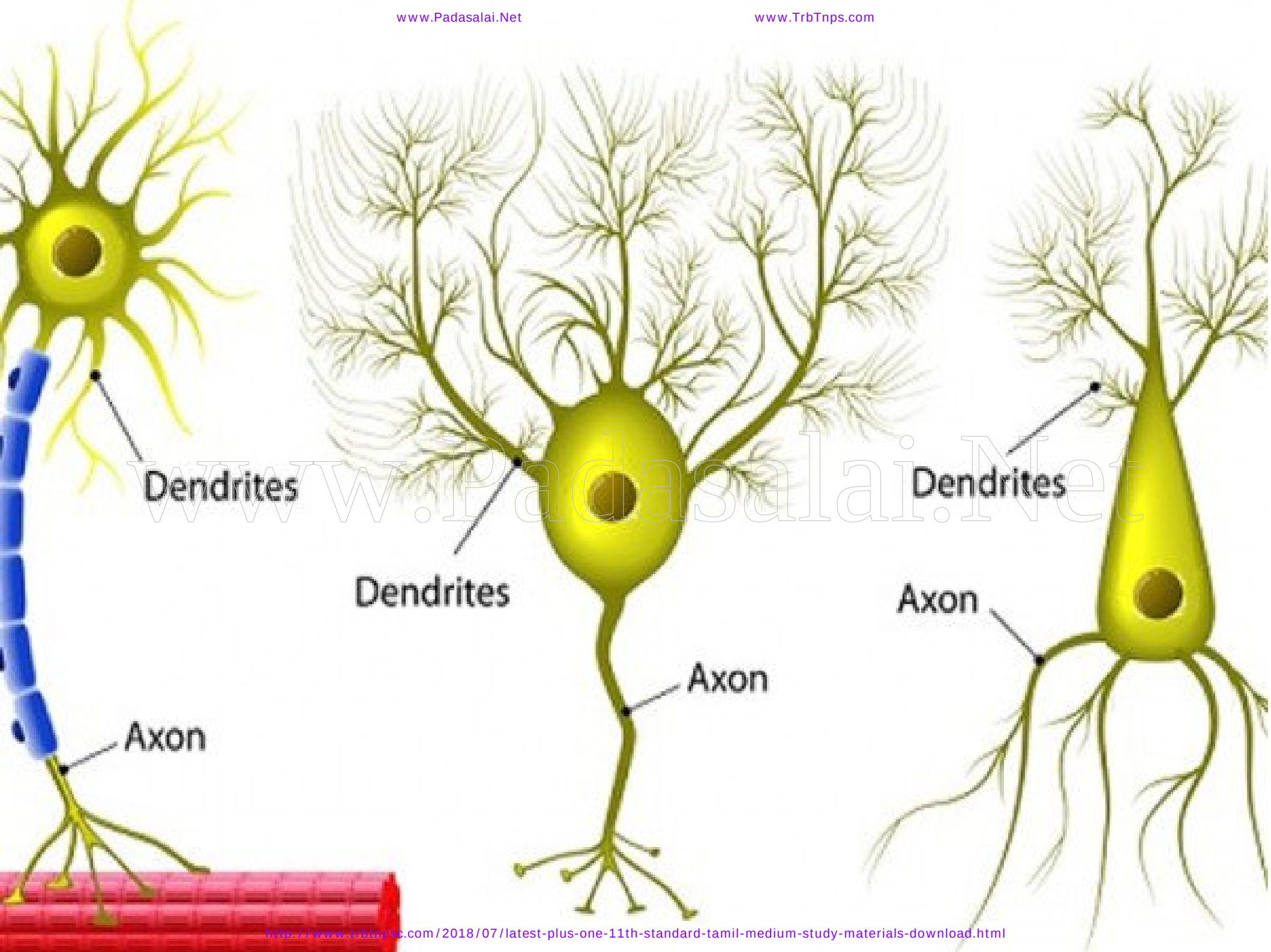
(touch and pain sensory neuron)



## Anaxonic neuron

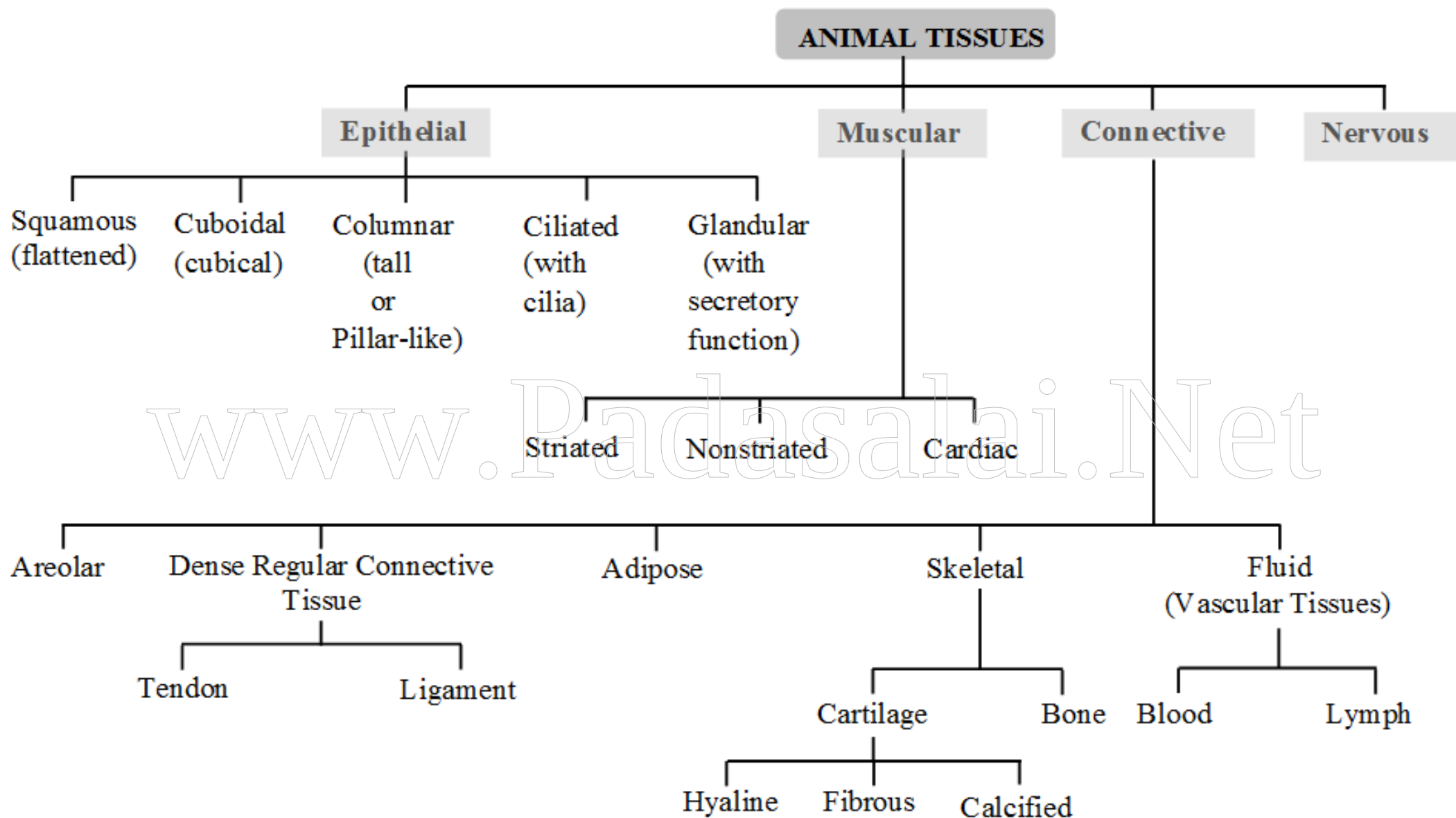
(Amacrine cell)





# மீள்பார்வை

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நன்றி

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