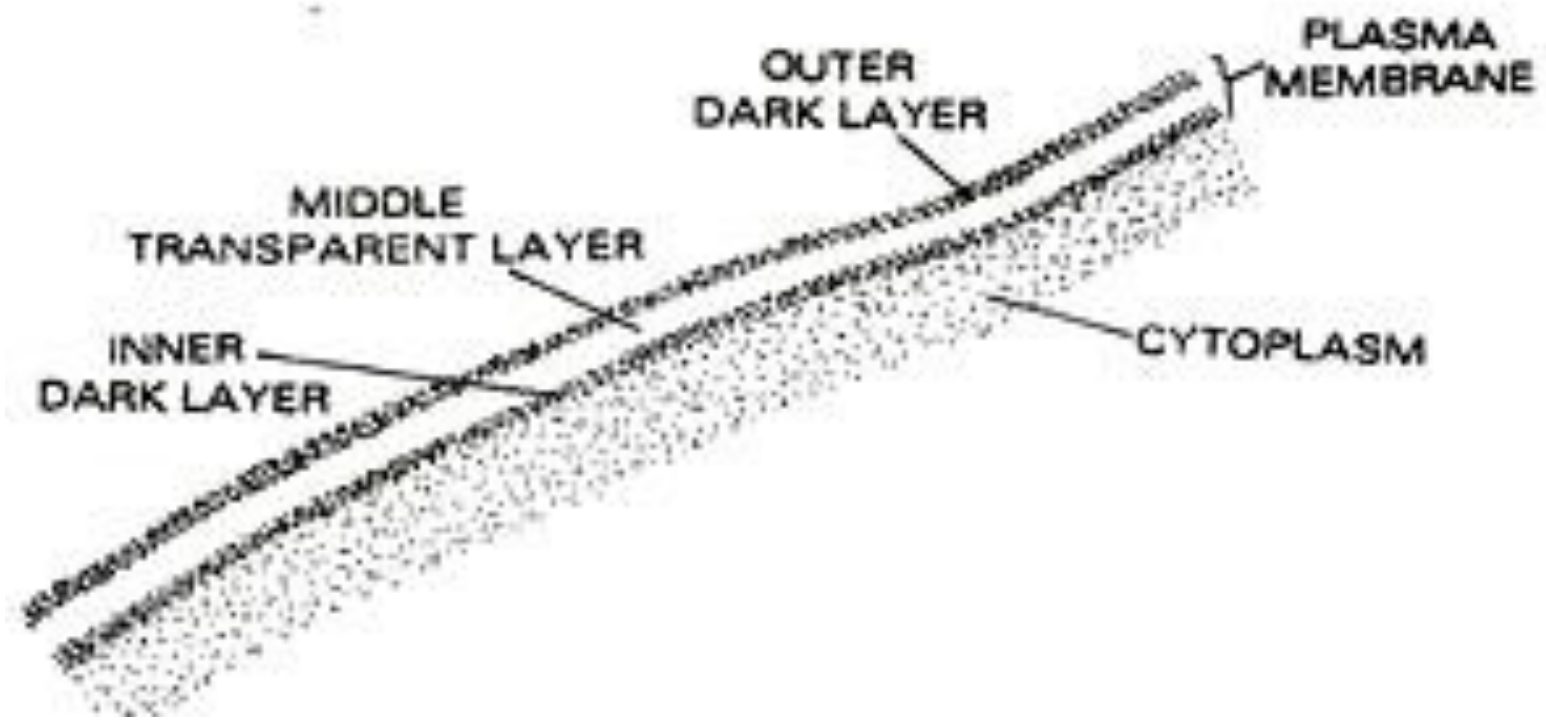
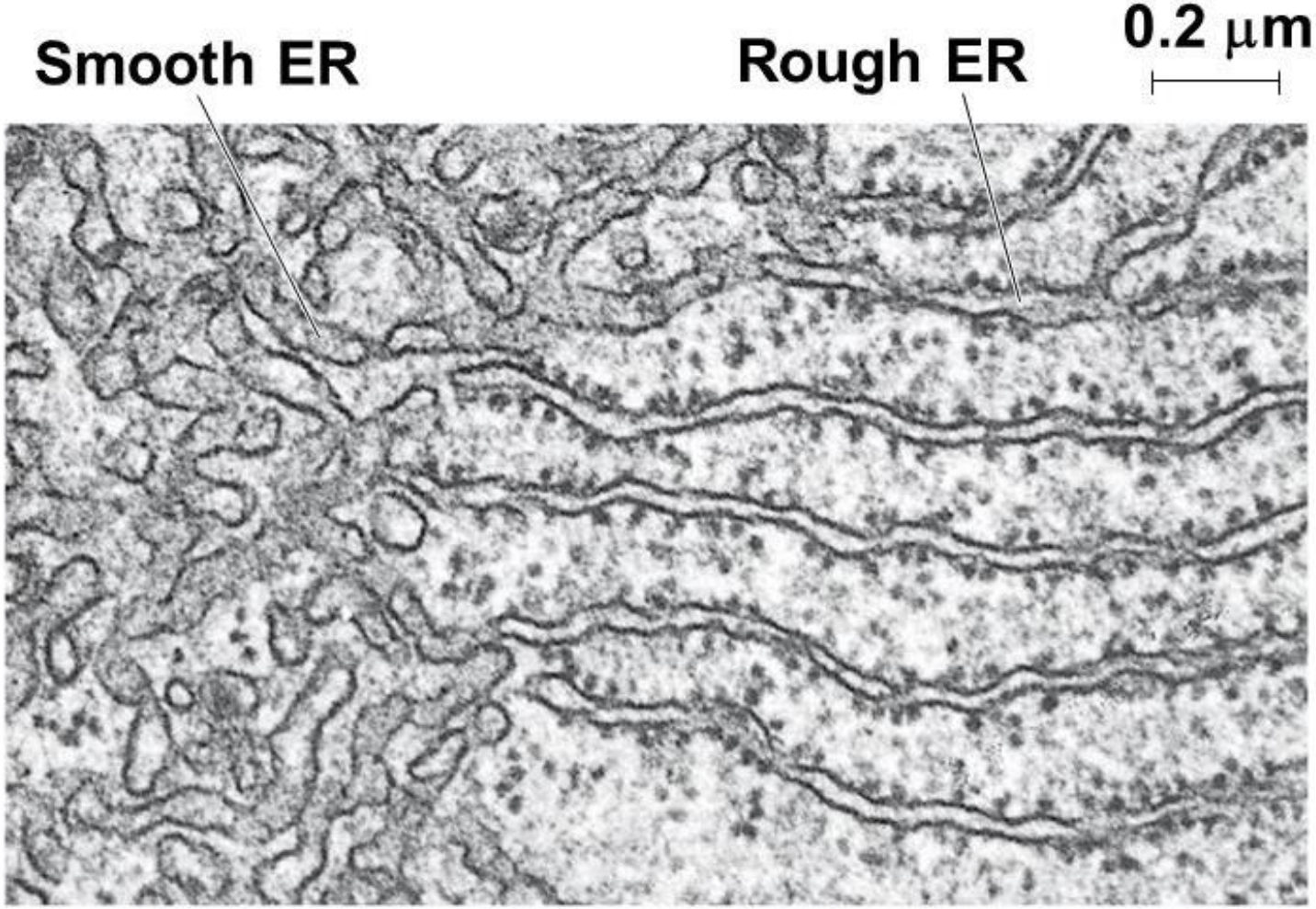
Review for Practical Section of Mid Exam

Hanan Jafar. BDS.MSc.PhD

Plasma Membrane



Endoplasmic Reticulum



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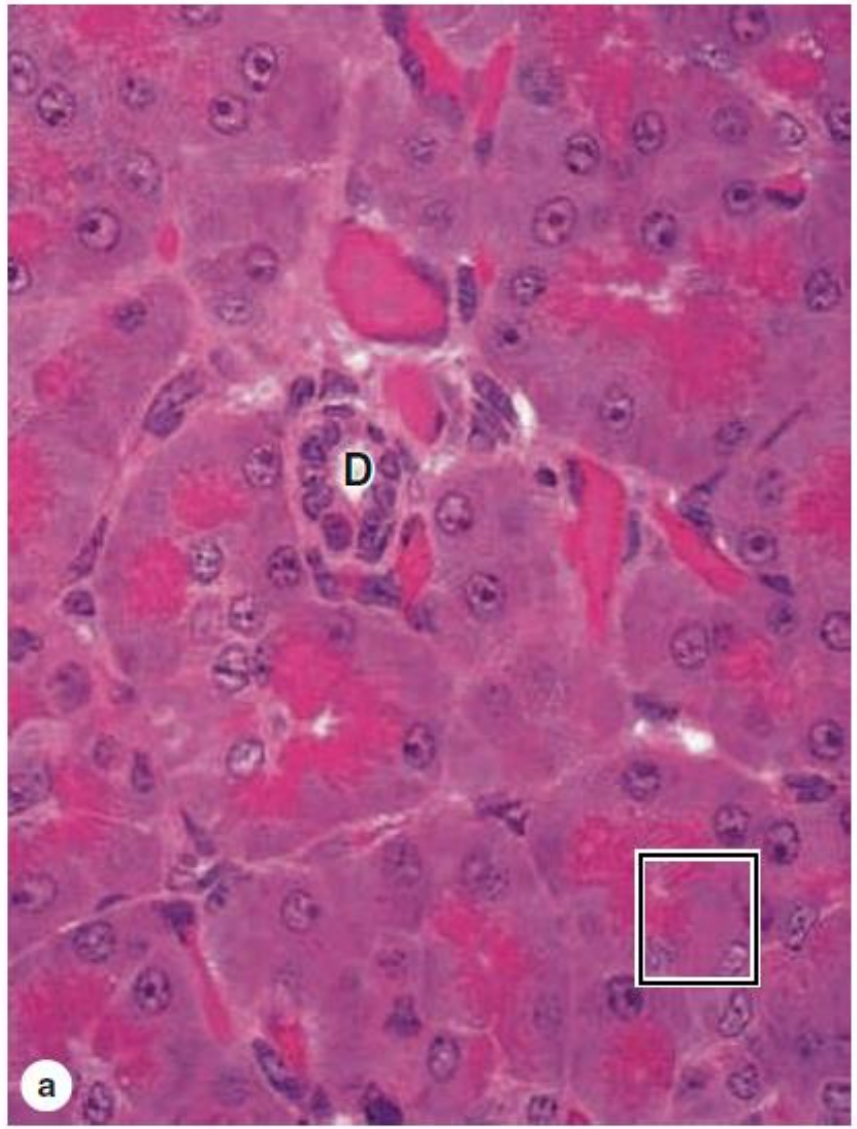
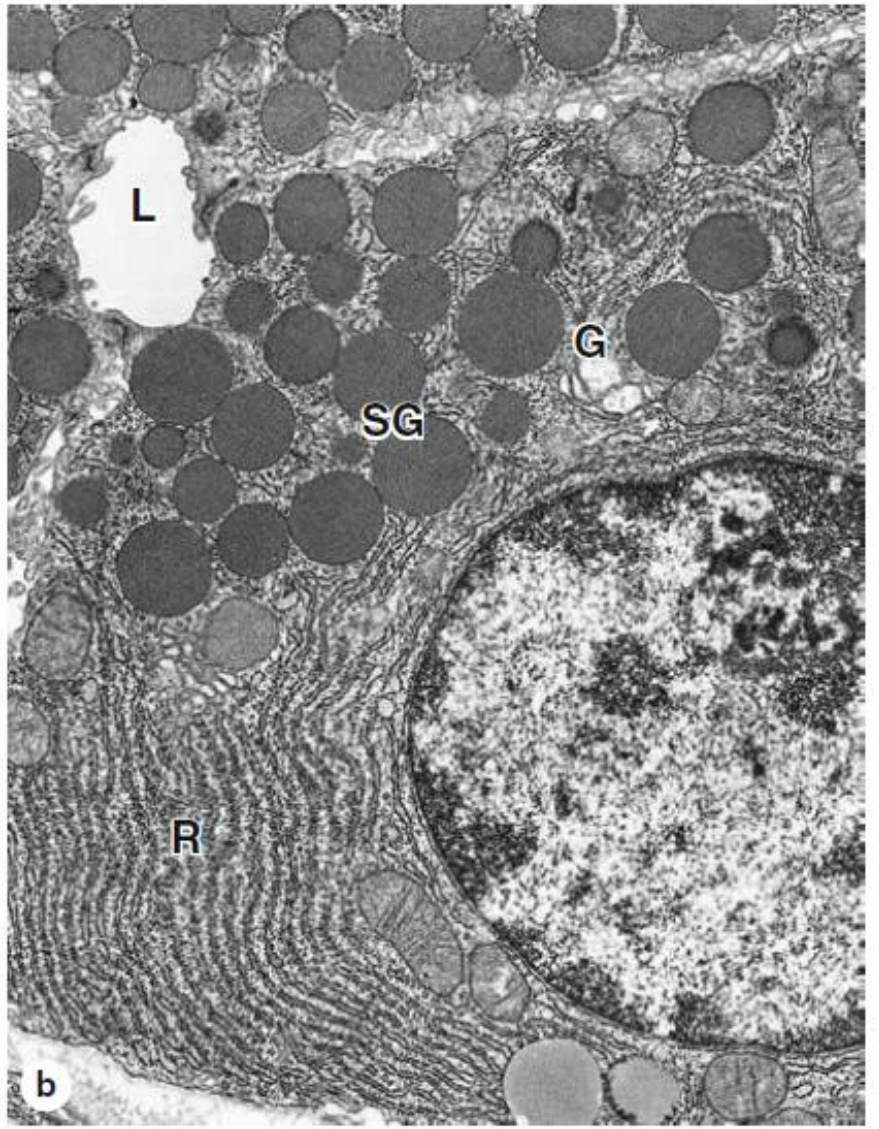
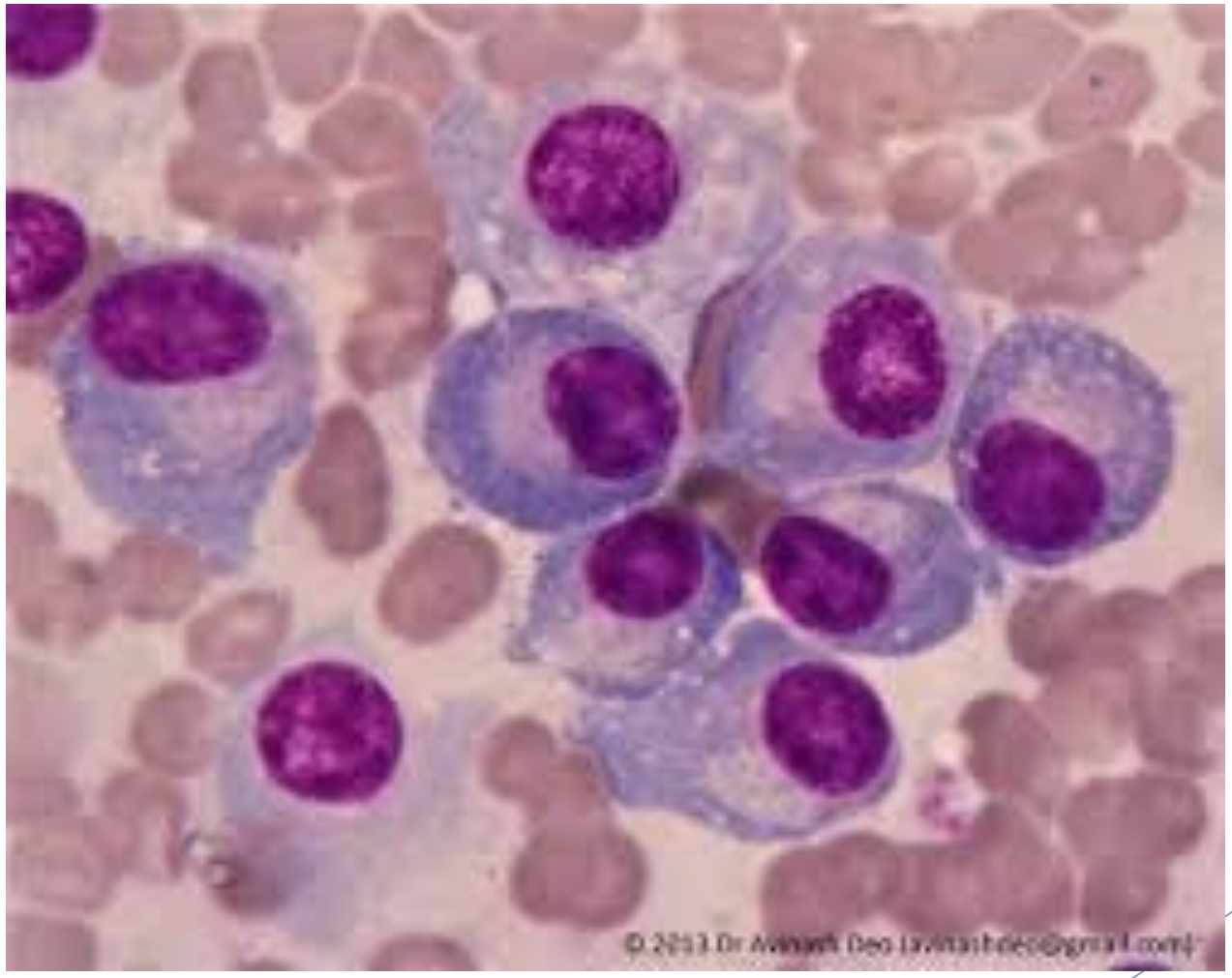
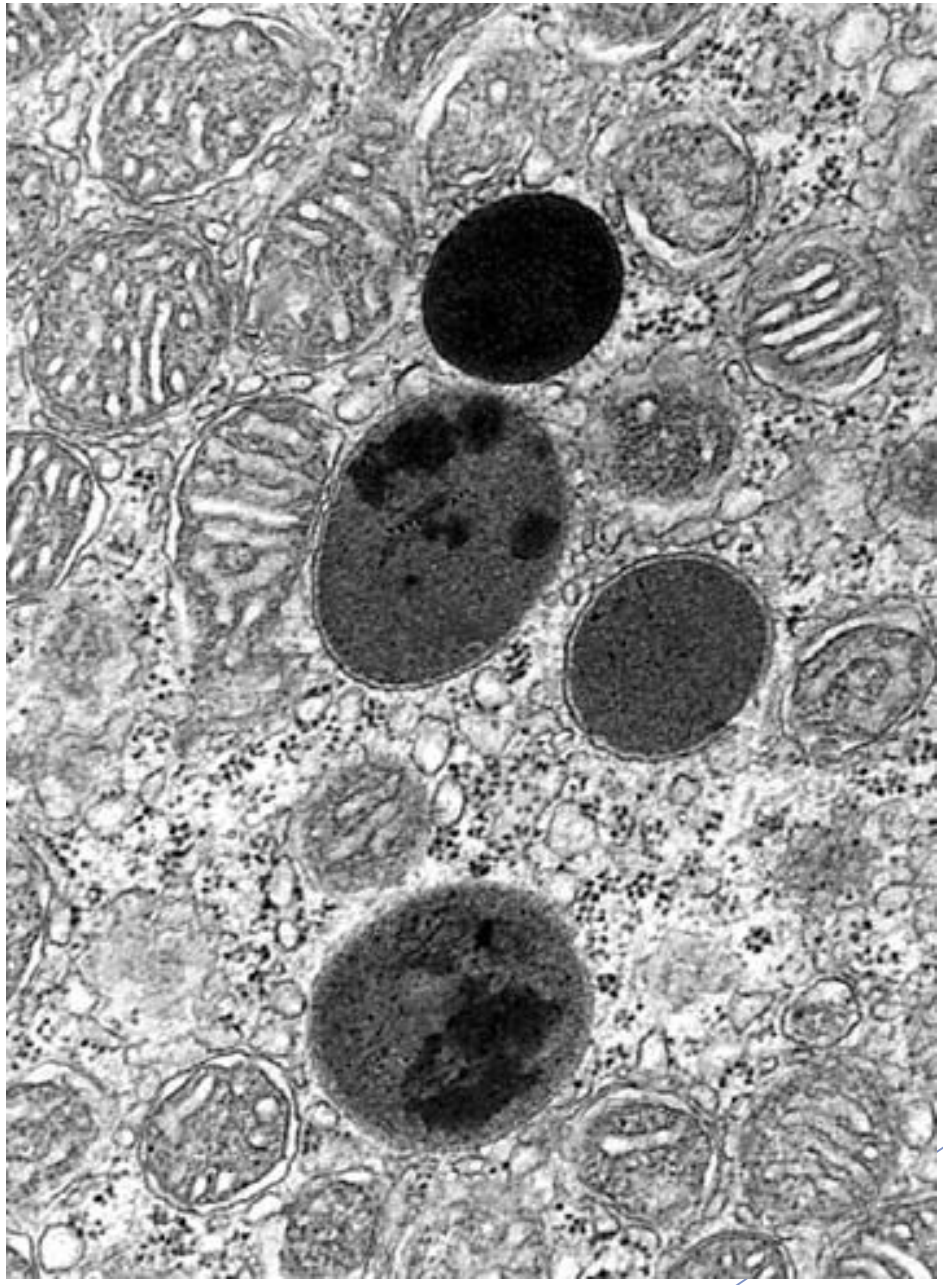




Golgi

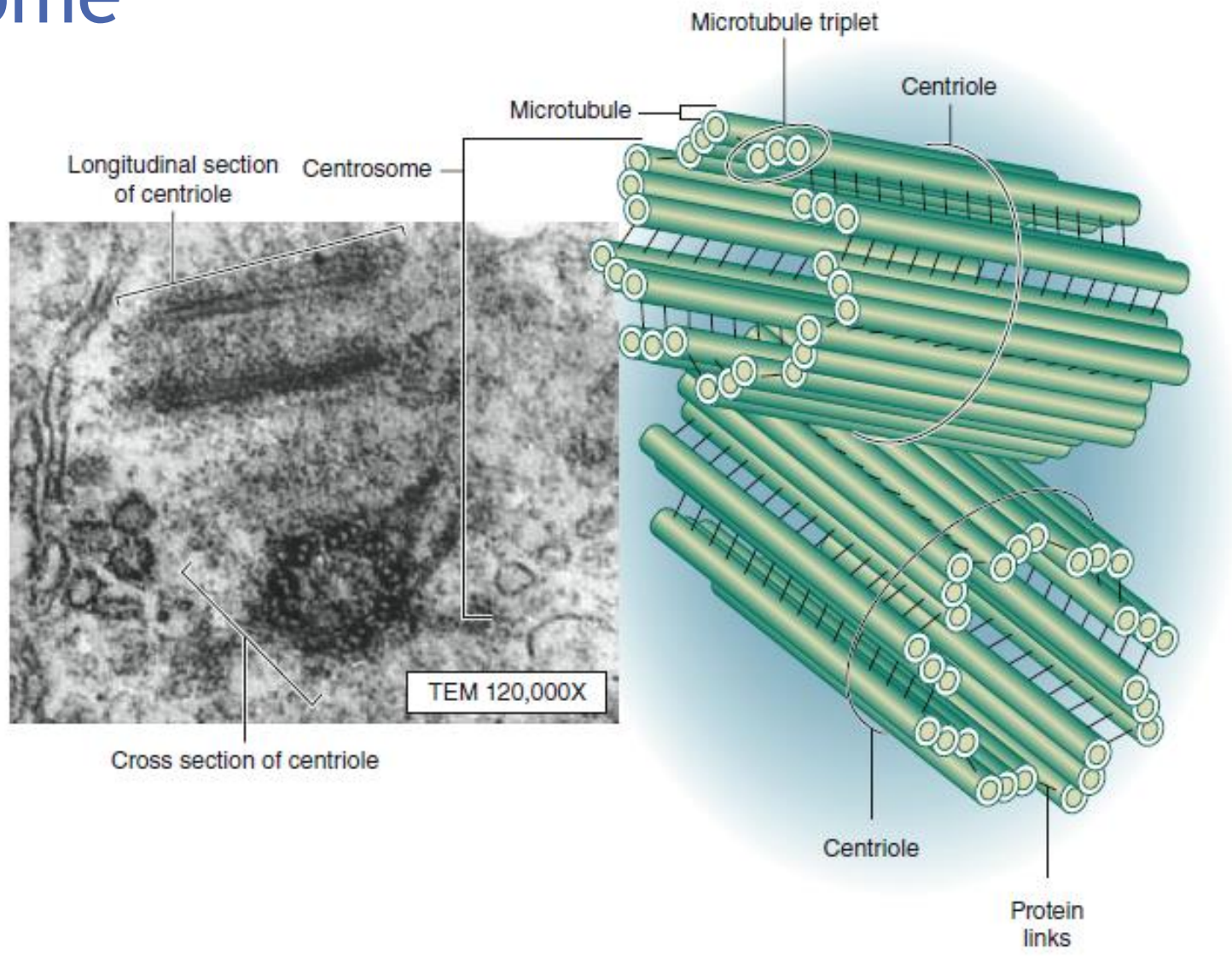


Lysosomes

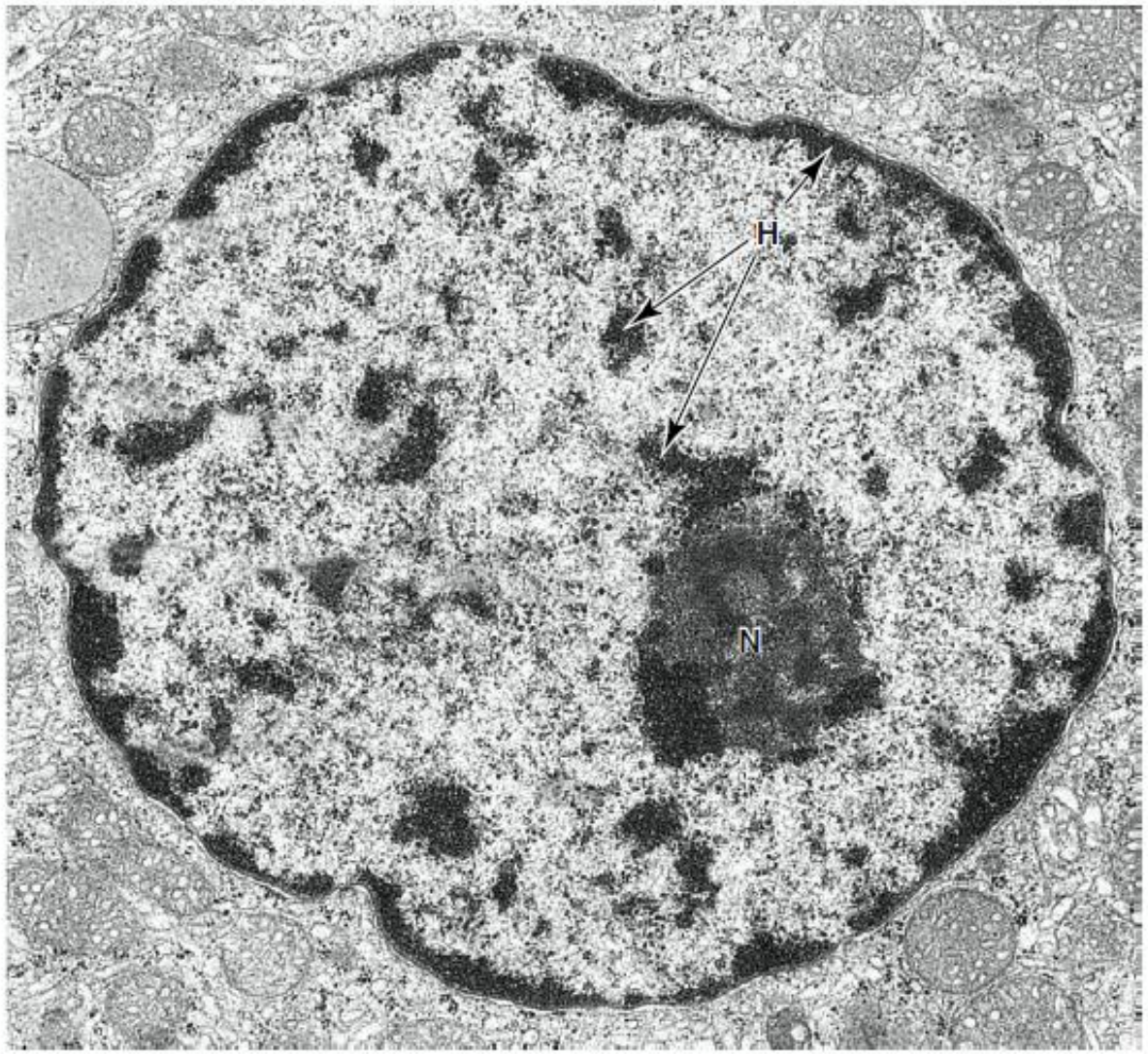


Mitochondria

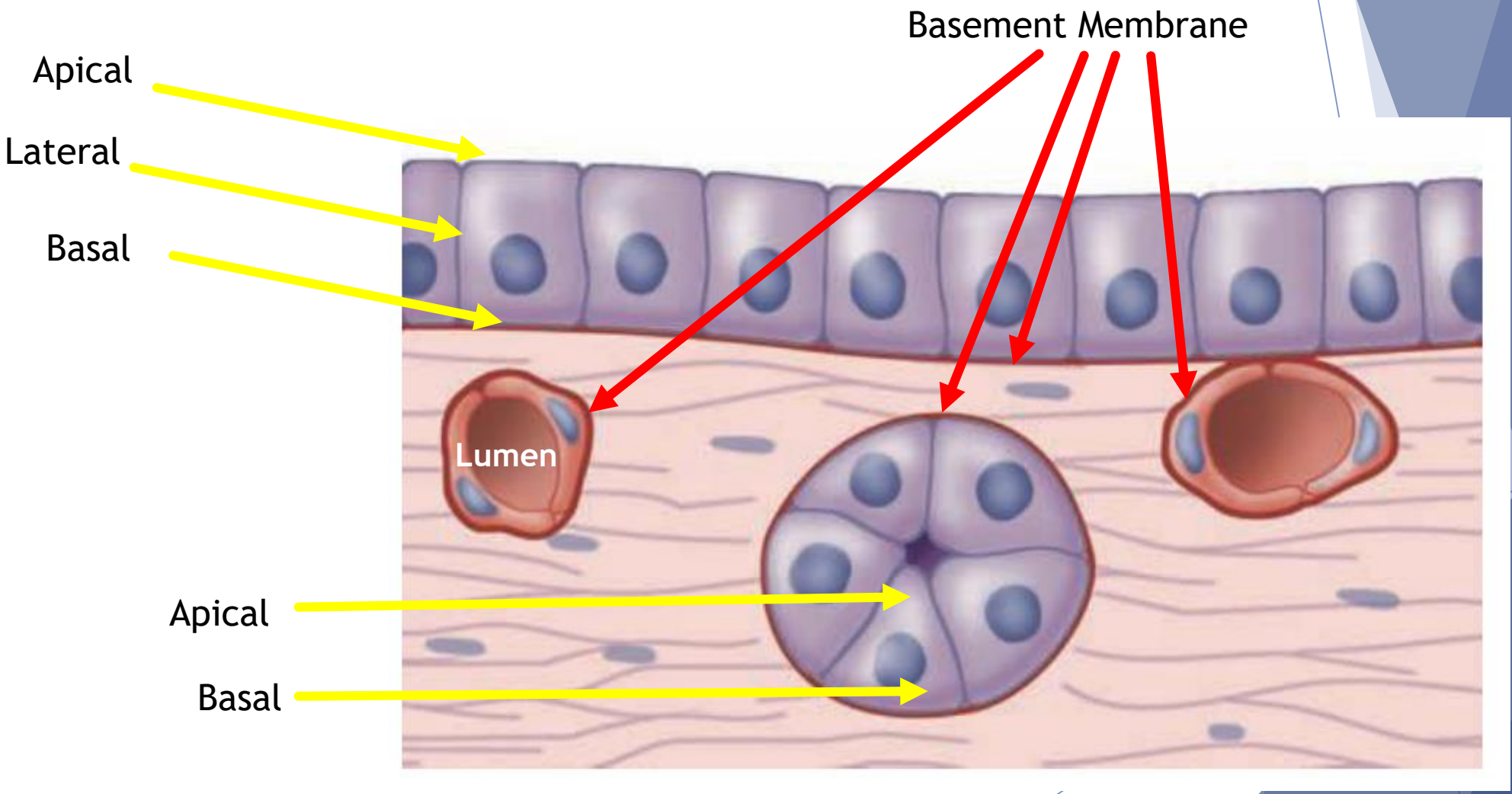
Centrosome

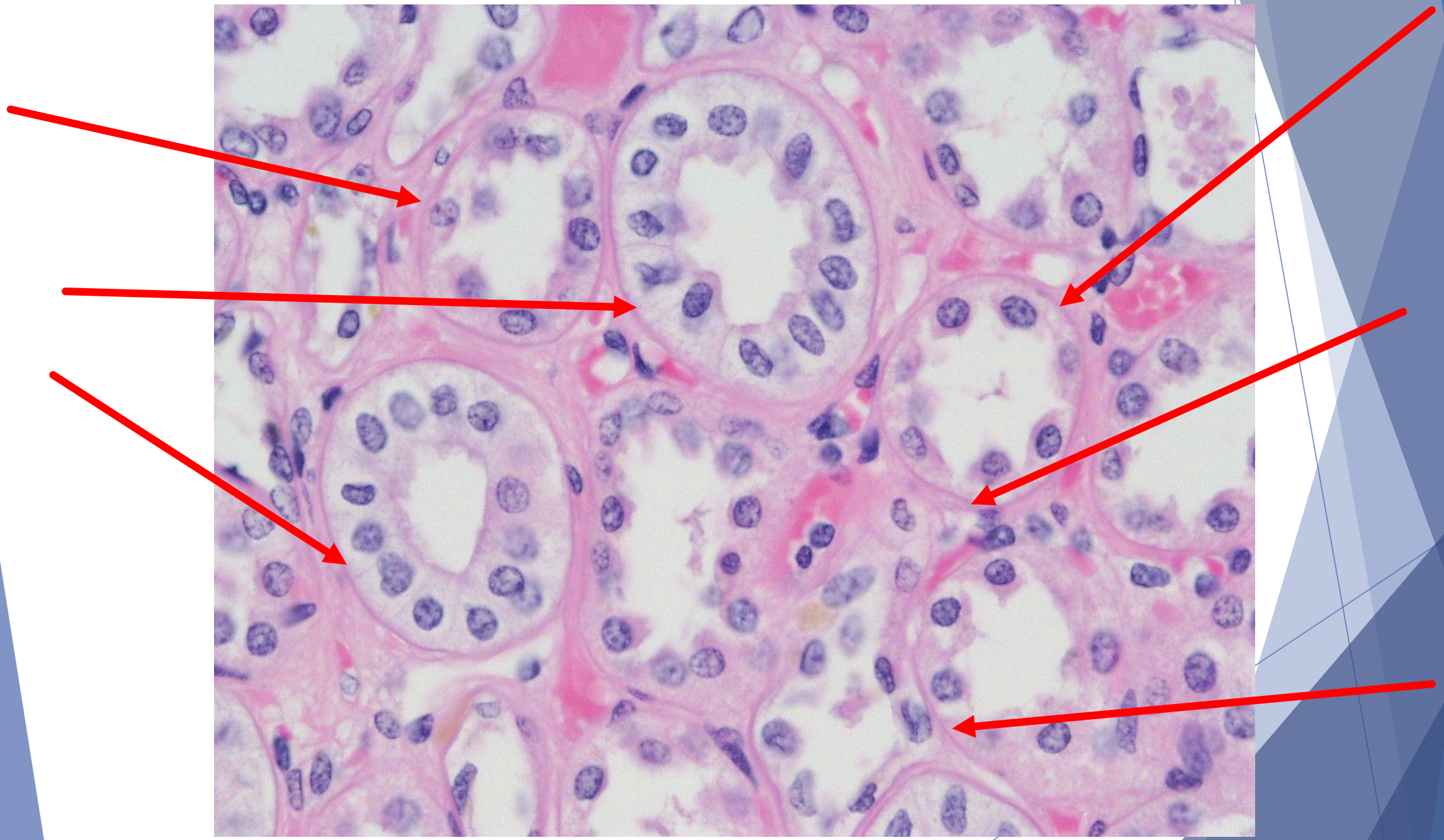

Microtubule triplet
Centriole
Microtubule
Longitudinal section of centriole
Centrosome
TEM 120,000X
Cross section of centriole
Centriole
Protein links

Nucleus

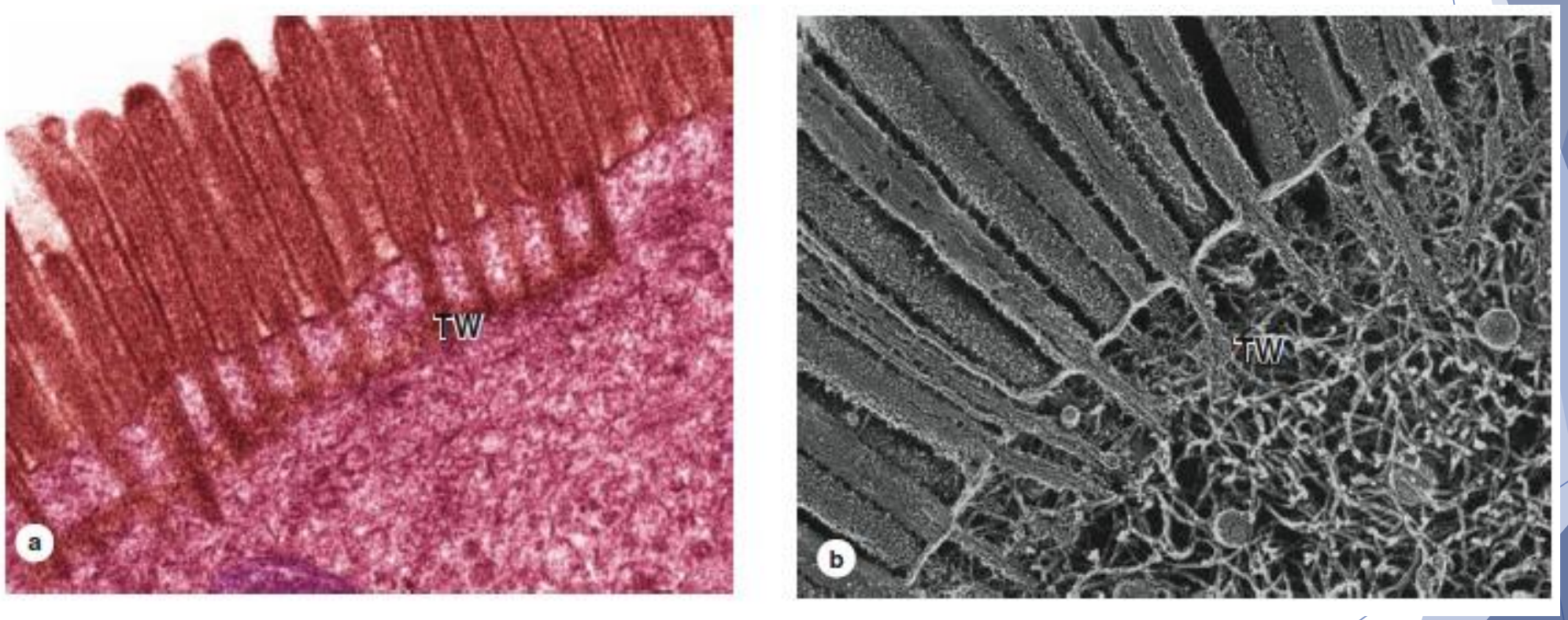


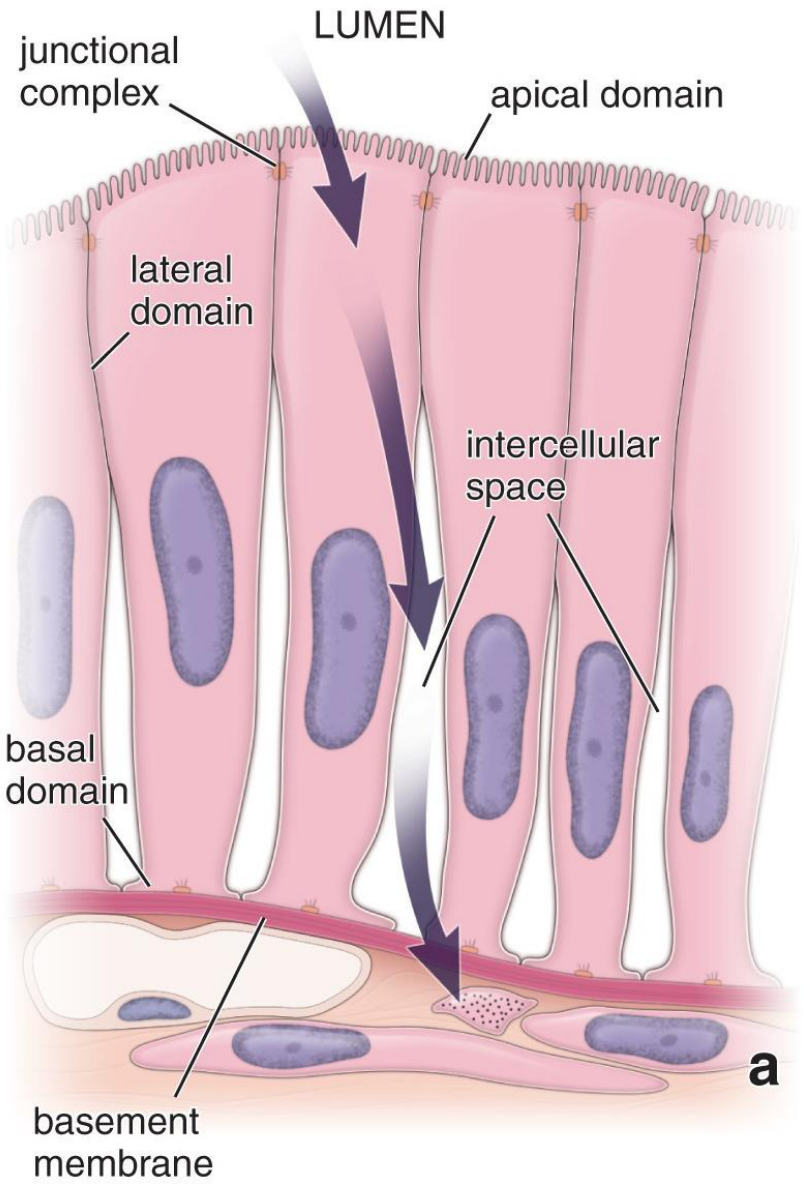
Epithelium

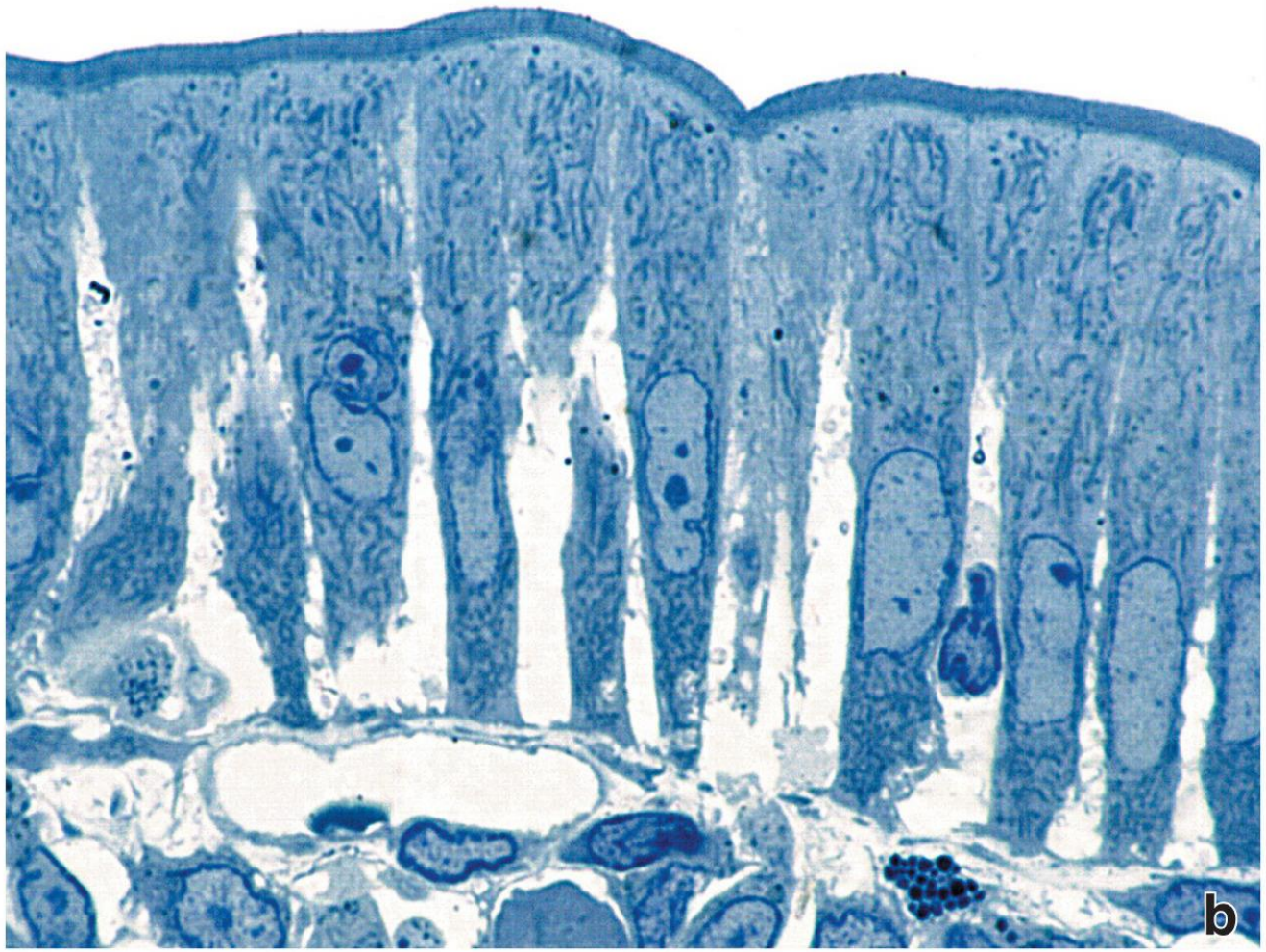

Basement Membrane
Apical
Lateral
Basal
Lumen
Apical
Basal



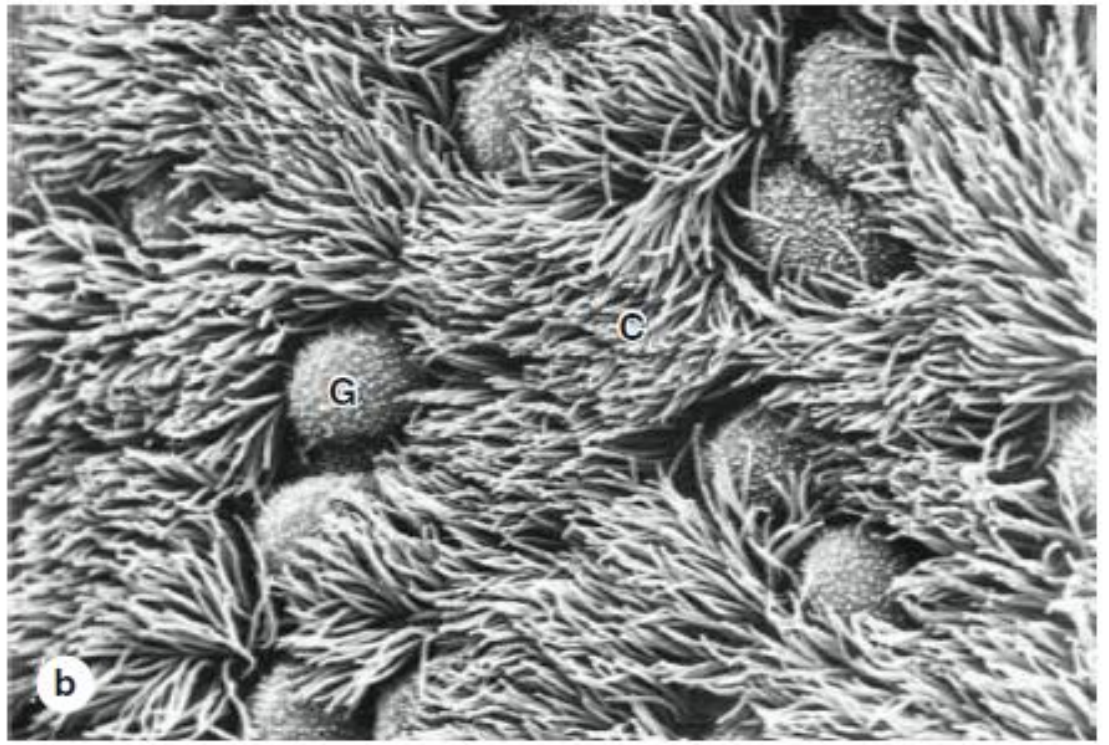
Microvilli

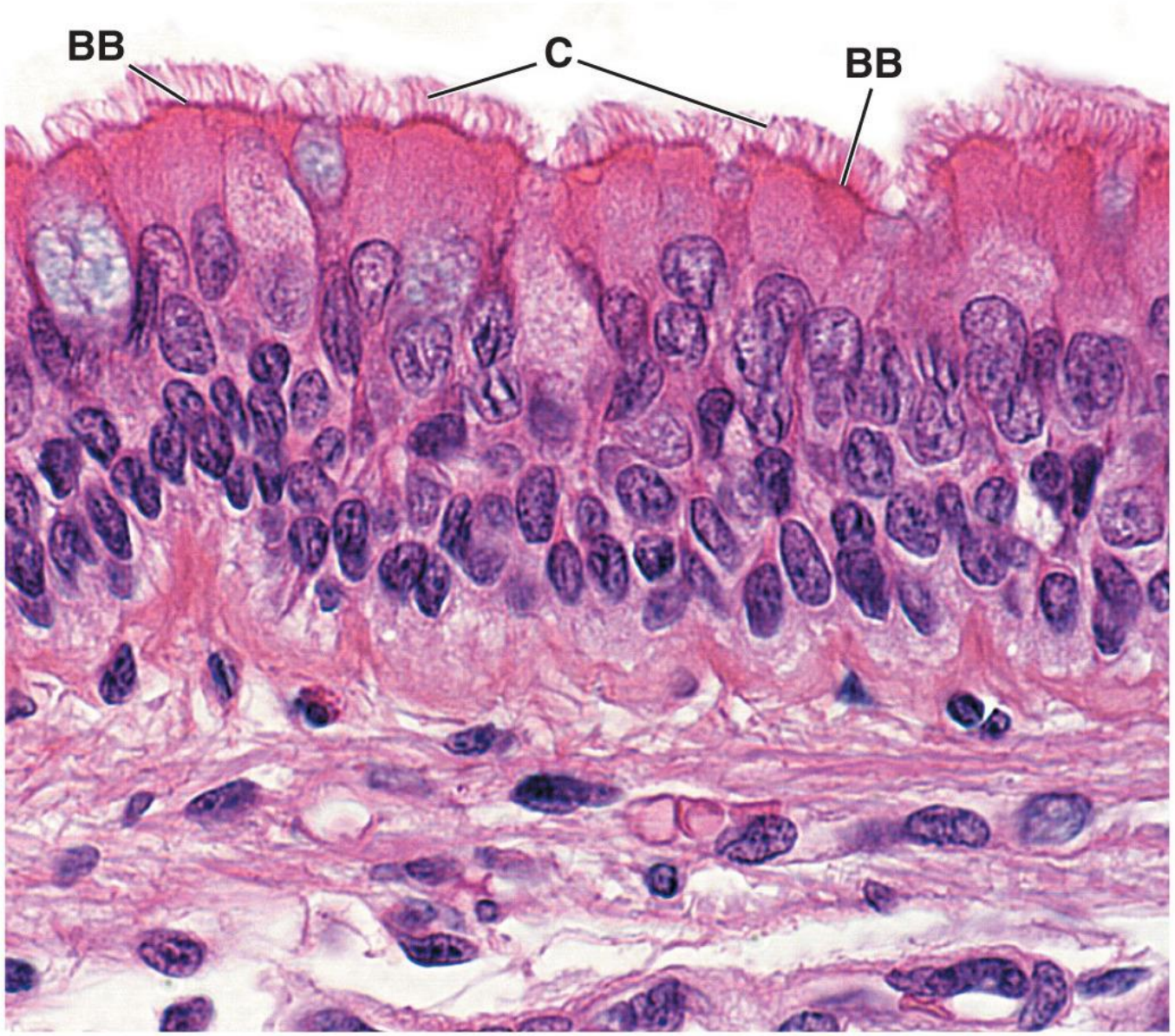






Cilia





Stereocilia

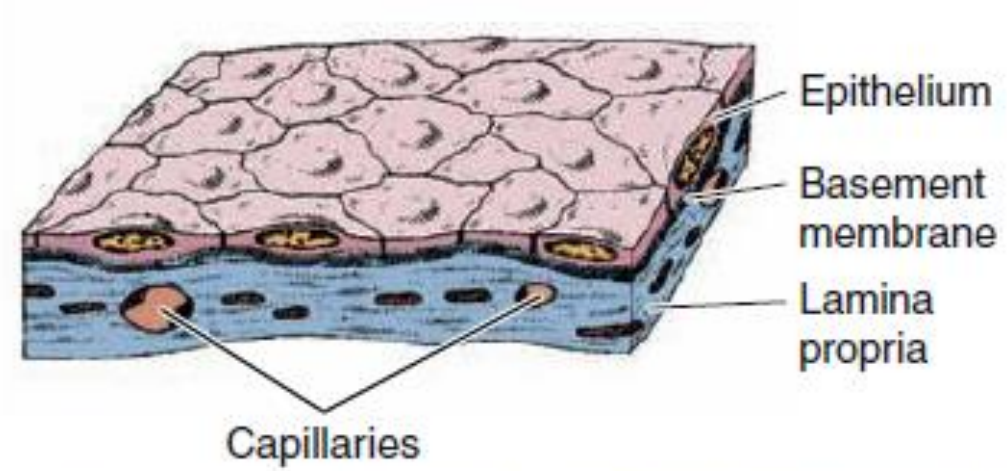
Junctional Complexes

TABLE 4–3 Common types of covering epithelia.

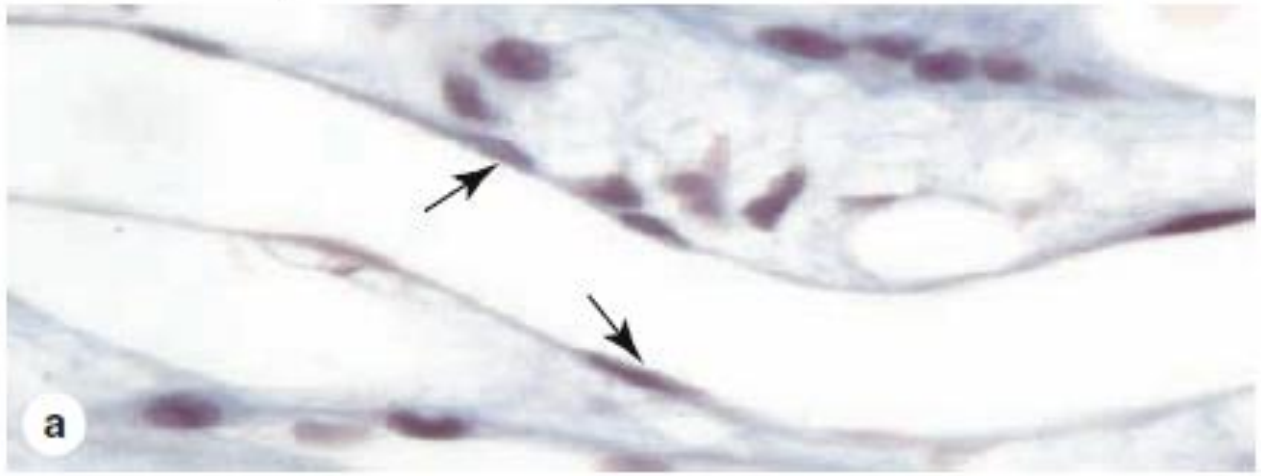
Major Feature	Cell Form	Examples of Distribution	Main Function
Simple (one layer of cells)	Squamous	Lining of vessels (endothelium); Serous lining of cavities: pericardium, pleura, peritoneum (mesothelium)	Facilitates the movement of the viscera (mesothelium), active transport by pinocytosis (mesothelium and endothelium), secretion of biologically active molecules (mesothelium)
	Cuboidal	Covering the ovary, thyroid	Covering, secretion
	Columnar	Lining of intestine, gallbladder	Protection, lubrication, absorption, secretion
Stratified (two or more layers of cells)	Squamous keratinized (dry)	Epidermis	Protection; prevents water loss
	Squamous nonkeratinized (moist)	Mouth, esophagus, larynx, vagina, anal canal	Protection, secretion; prevents water loss
	Cuboidal	Sweat glands, developing ovarian follicles	Protection, secretion
	Transitional	Bladder, ureters, renal calyces	Protection, distensibility
	Columnar	Conjunctiva	Protection
Pseudostratified (layers of cells with nuclei at different levels; not all cells reach surface but all adhere to basal lamina)		Lining of trachea, bronchi, nasal cavity	Protection, secretion; cilia-mediated transport of particles trapped in mucus out of the air passages

Simple squamous epithelium

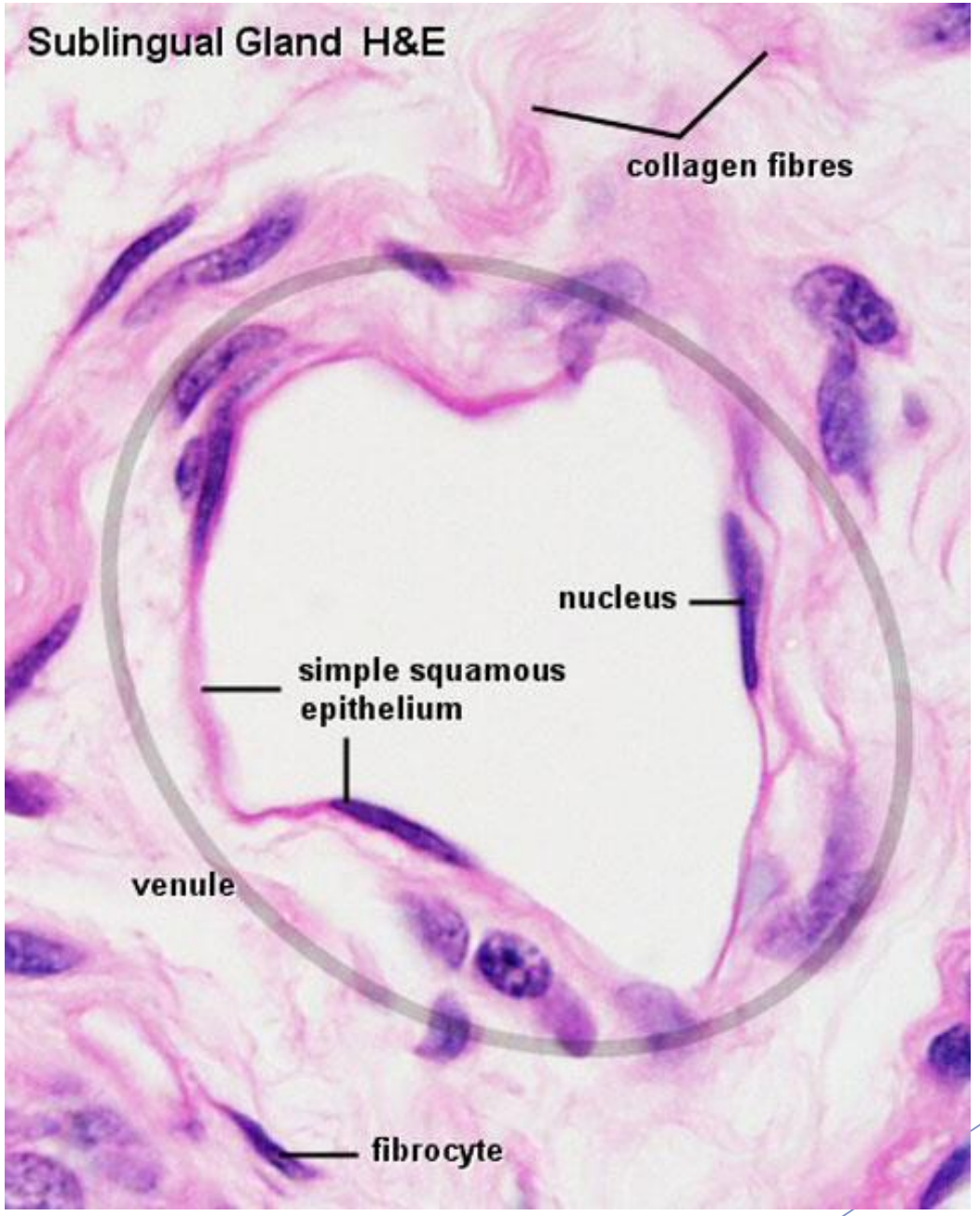
- Endothelium



Longitudinal section

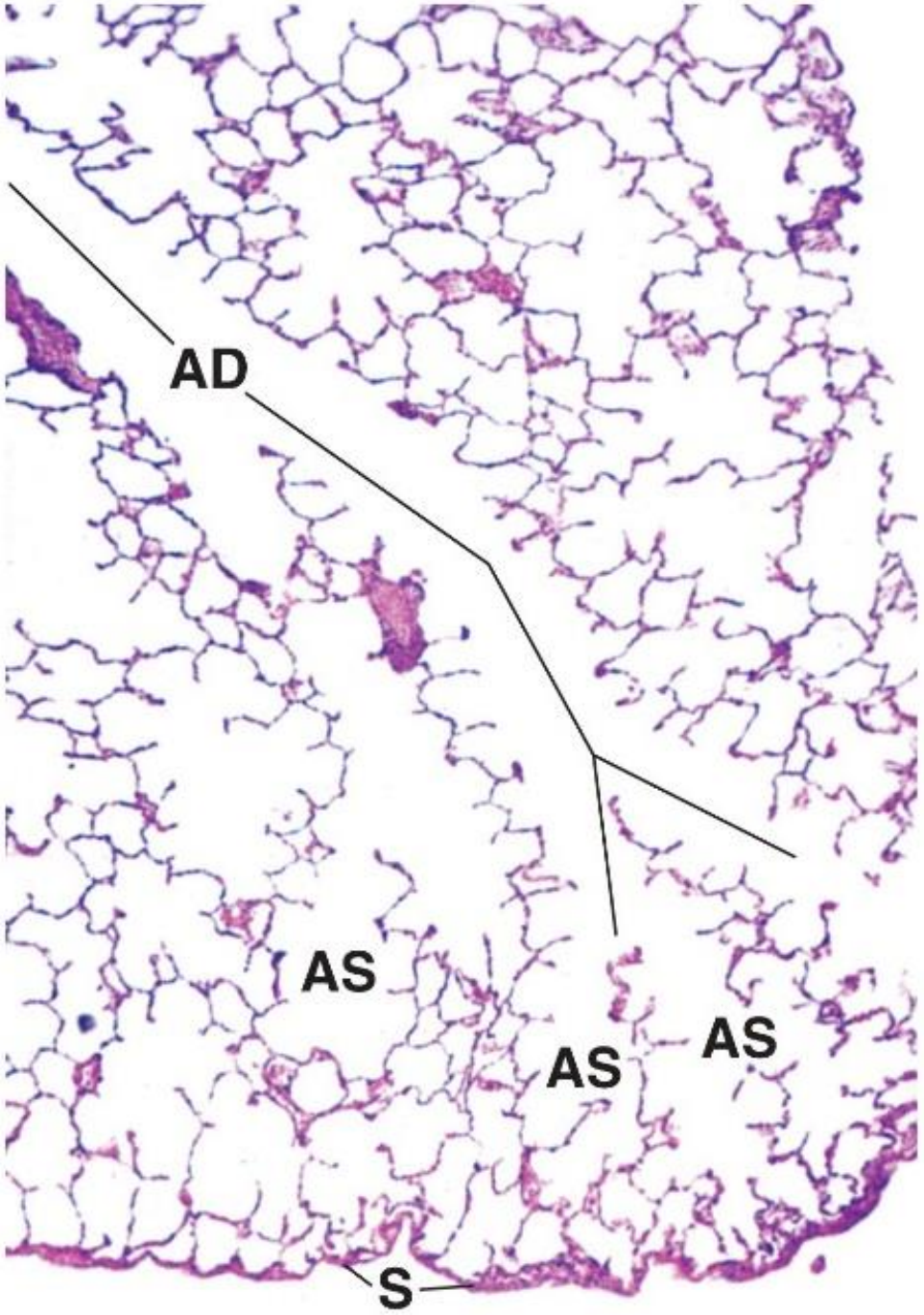


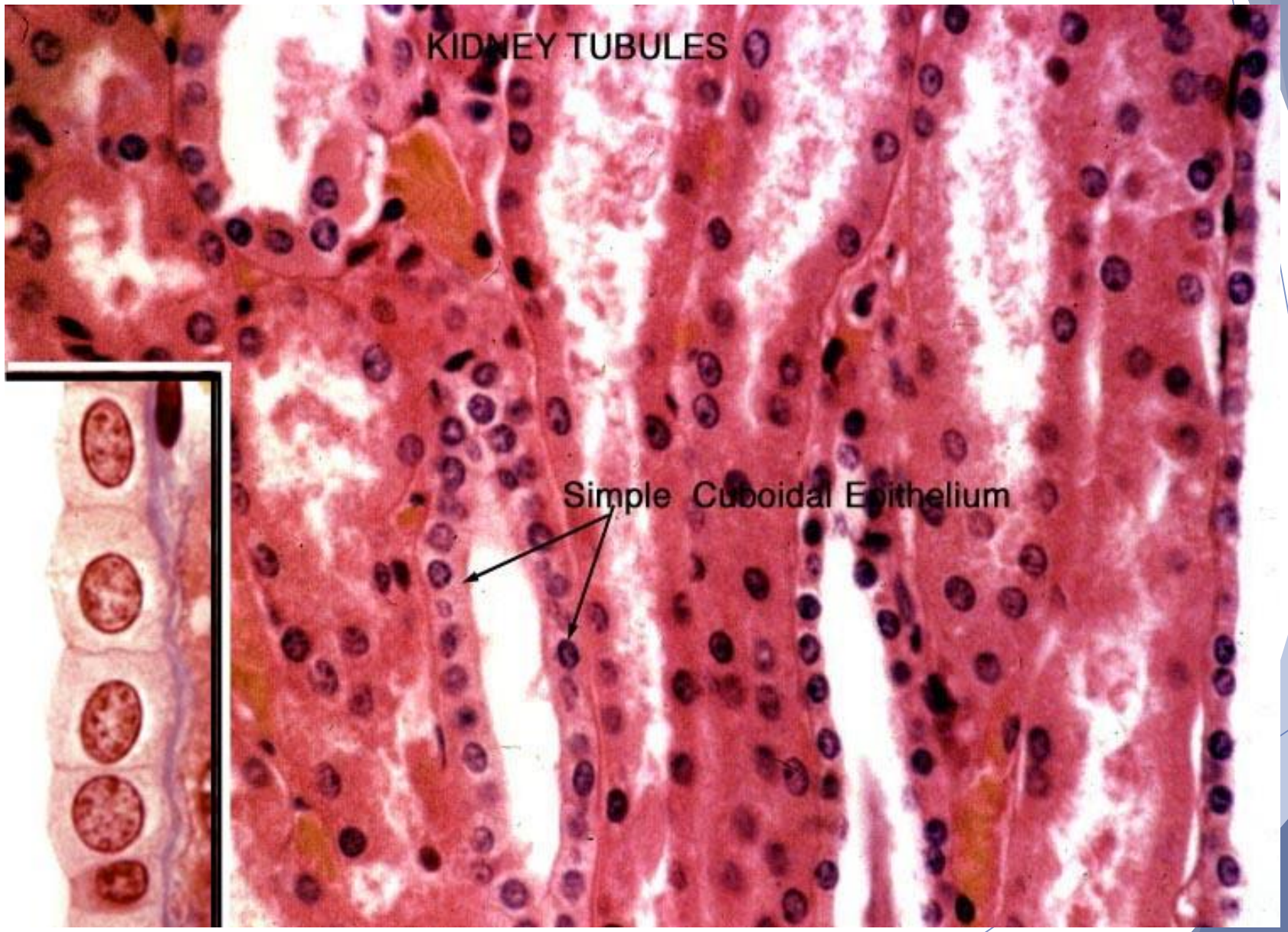
Cross section



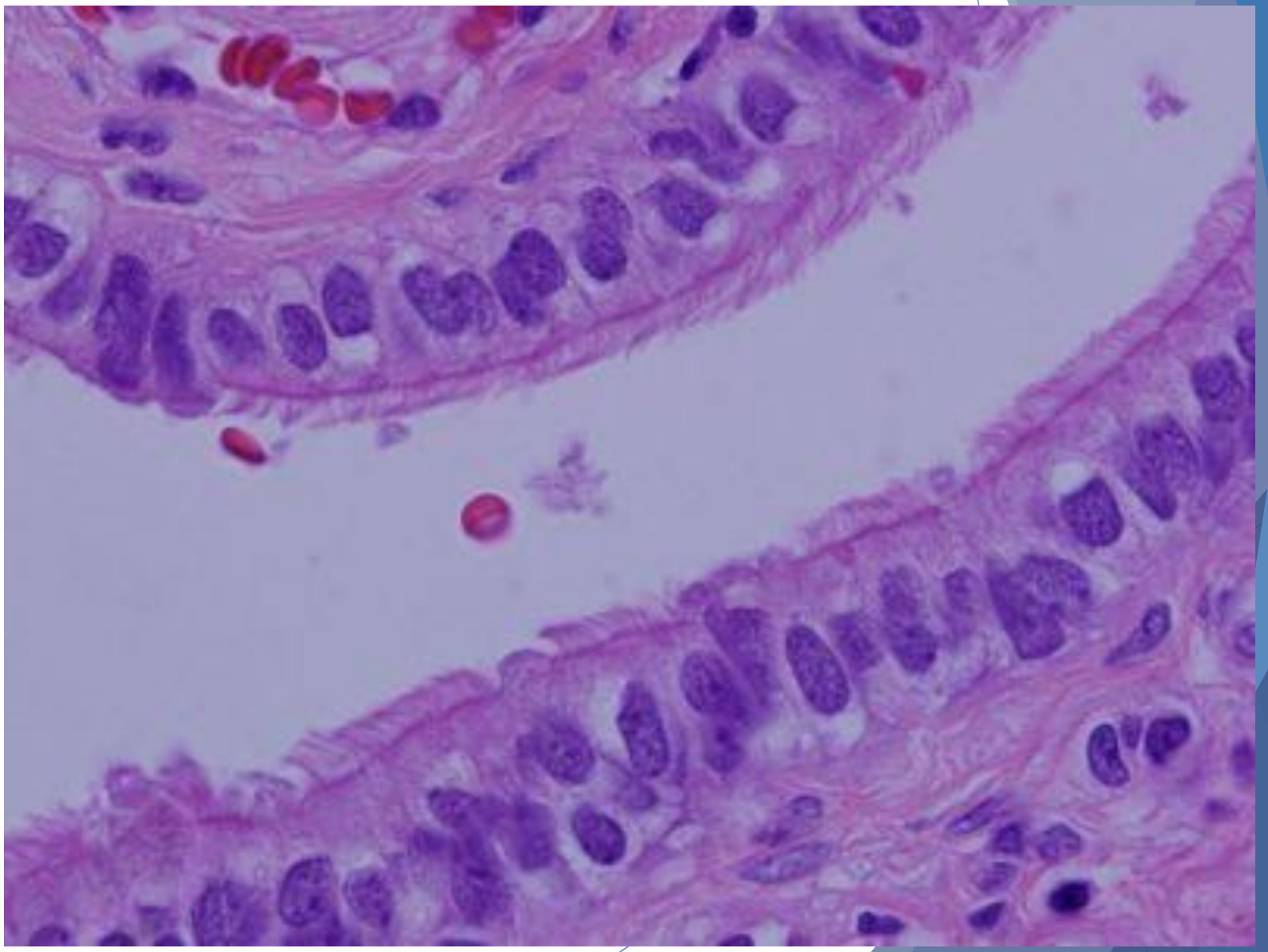
Simple squamous epithelium

- Alveoli

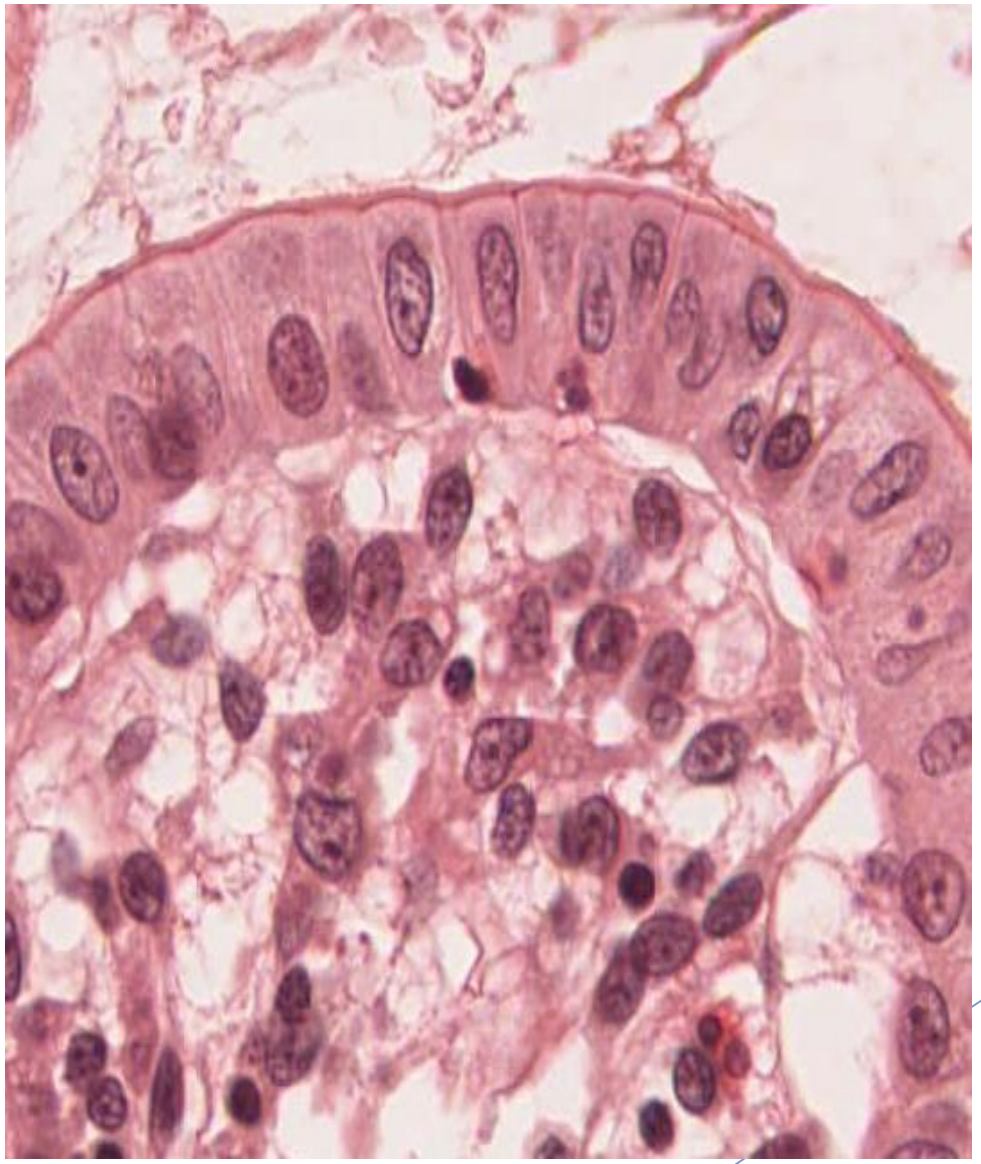



KIDNEY TUBULES
Simple Cuboidal Epithelium

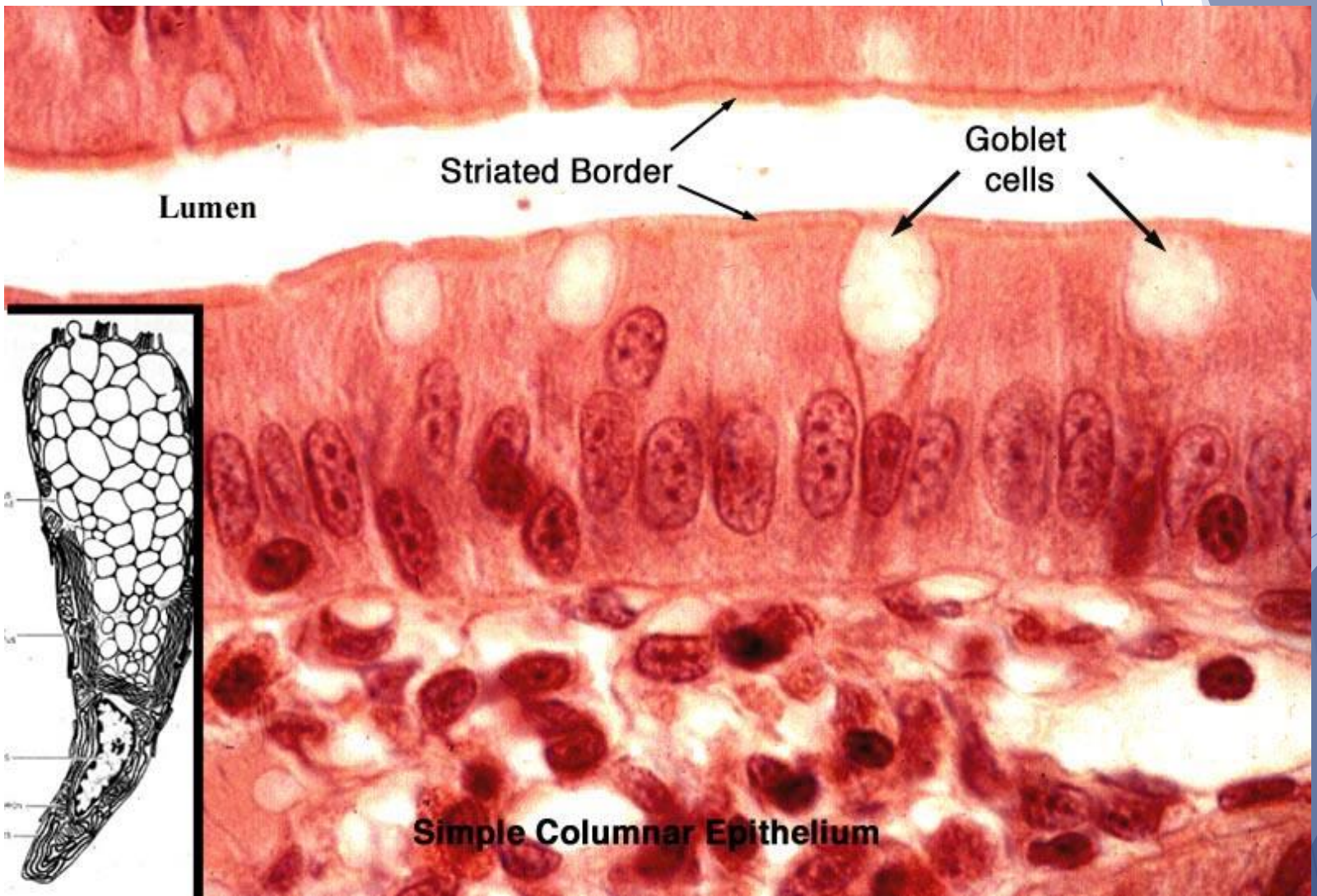
Simple columnar epithelium ciliated



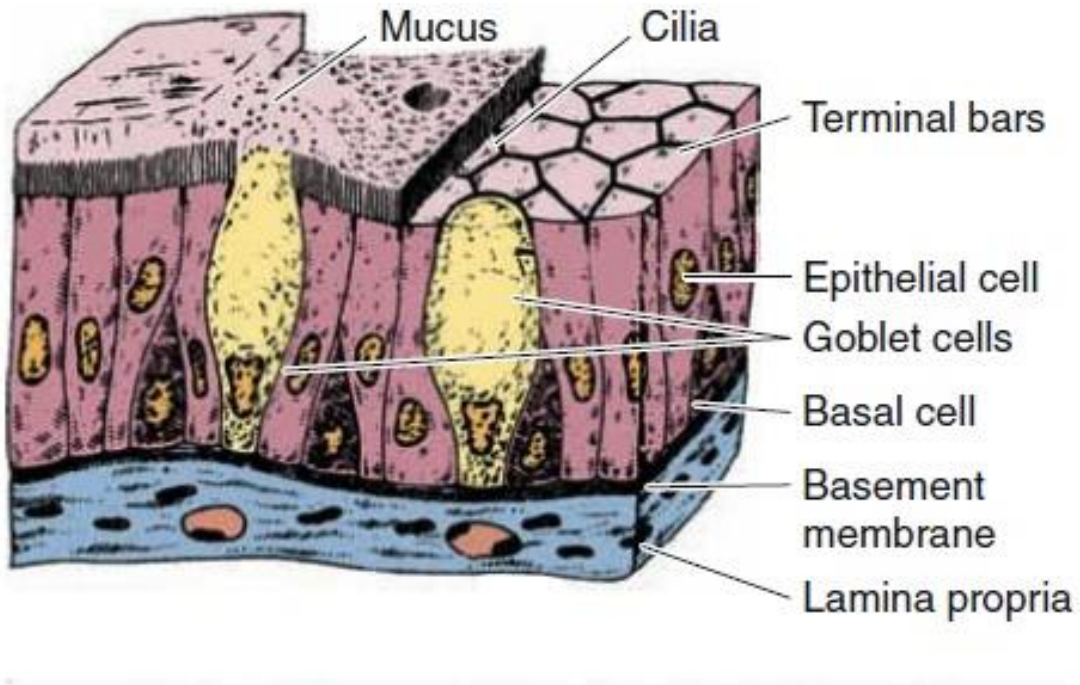
Simple columnar epithelium with microvilli

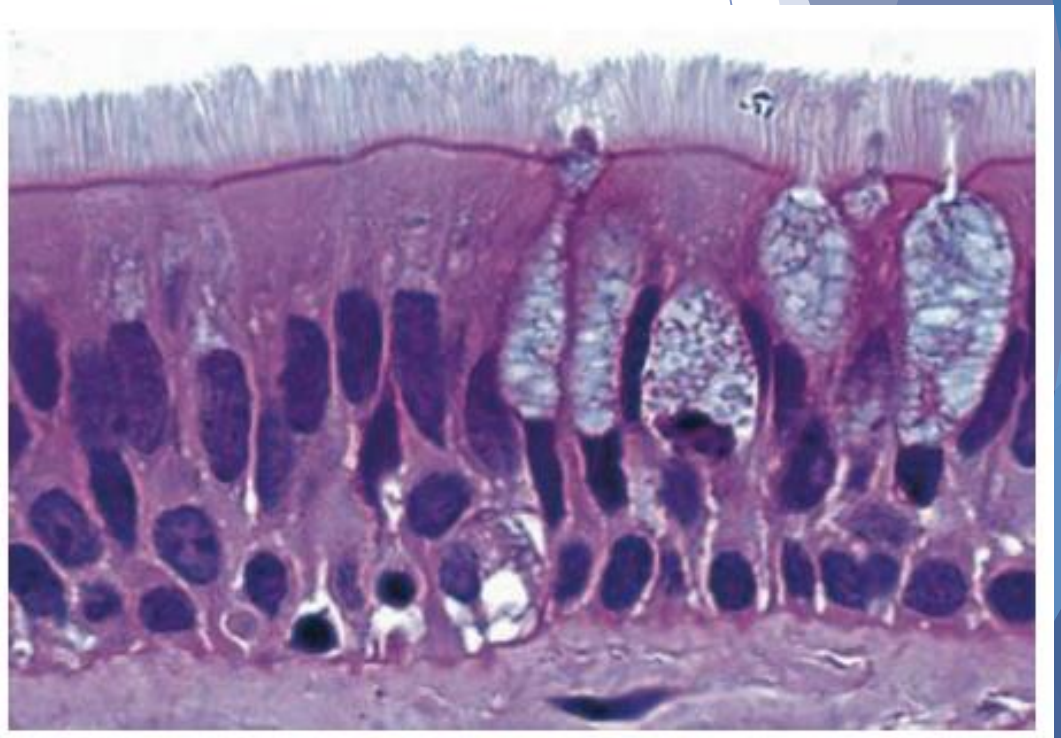


Simple columnar epithelium with microvilli and goblet cells



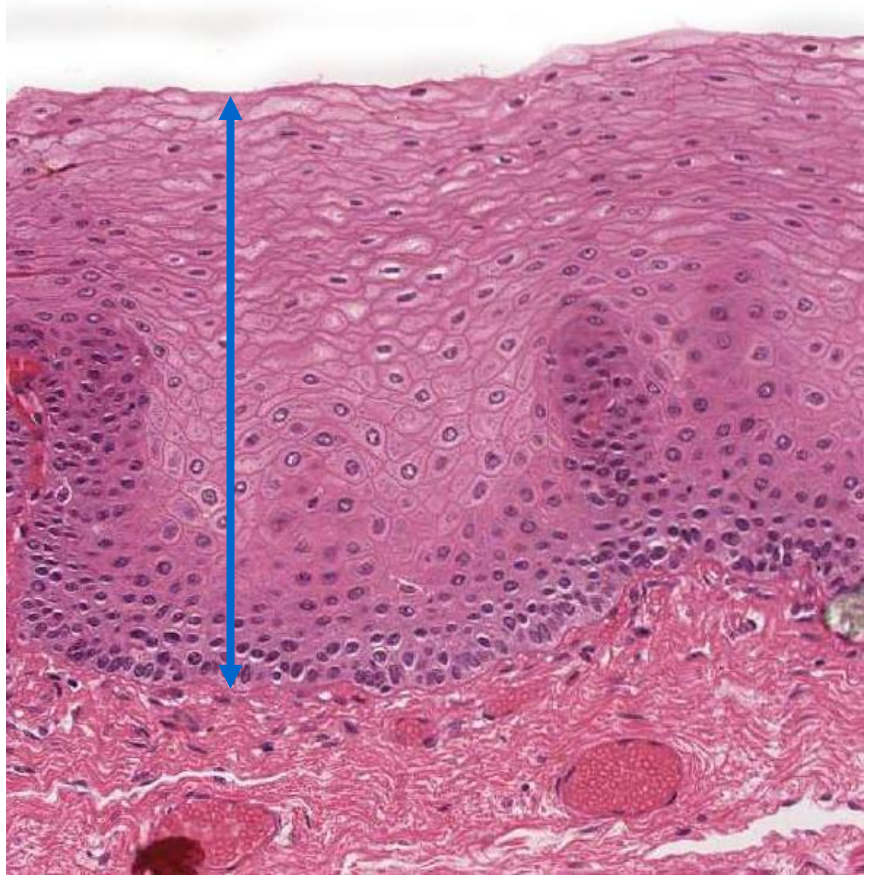
Ciliated psudostratified columnar epithelium with goblet cells (Respiratory)





Stratified Squamous Epithelium

Non-keratinized



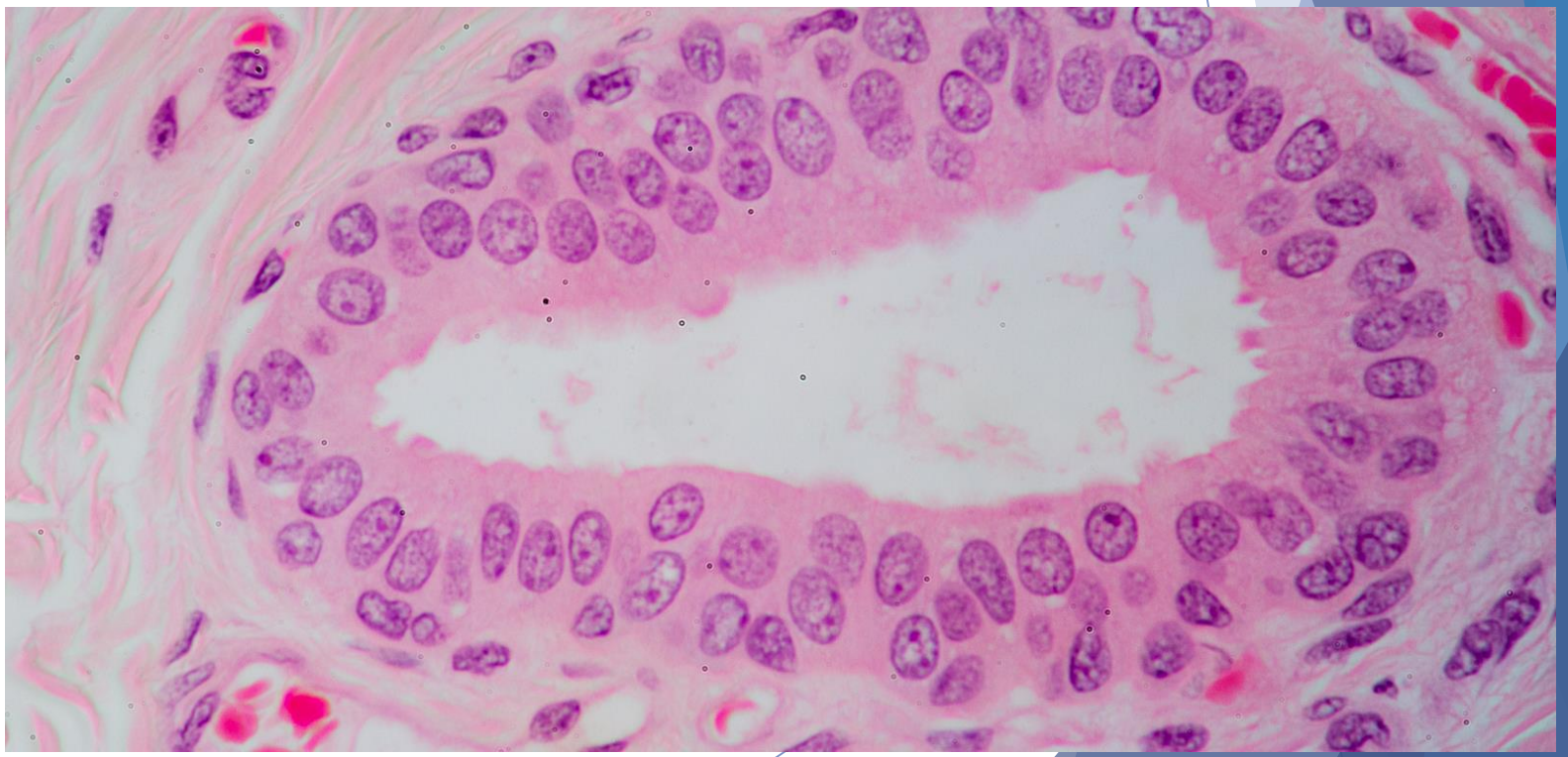
Lines esophagus, oral cavity, vagina…

Keratinized

Lines thick and thin skin

Stratified cuboidal

- Two layers only
- Found lining larger ducts of glands

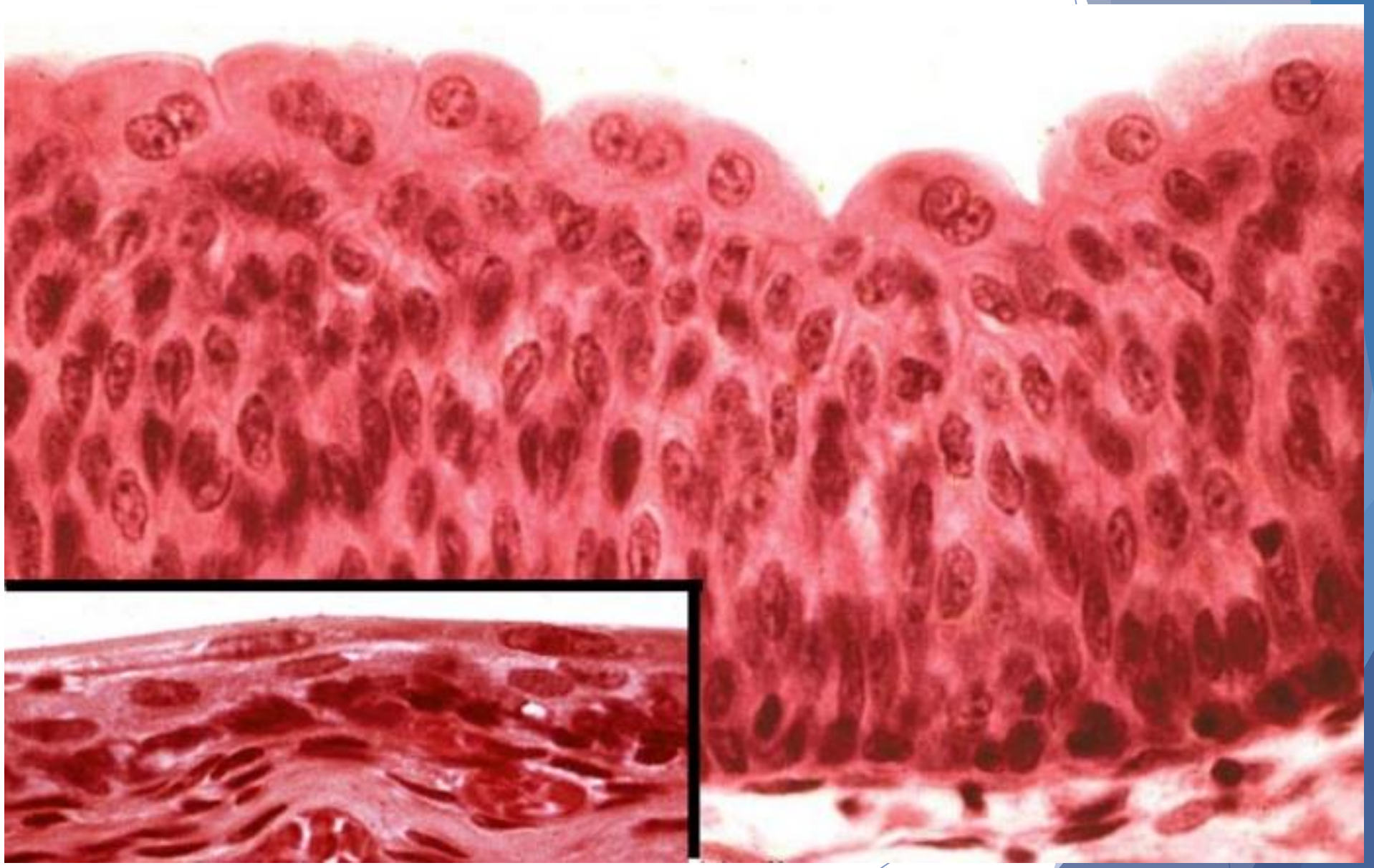


Stratified columnar epithelium

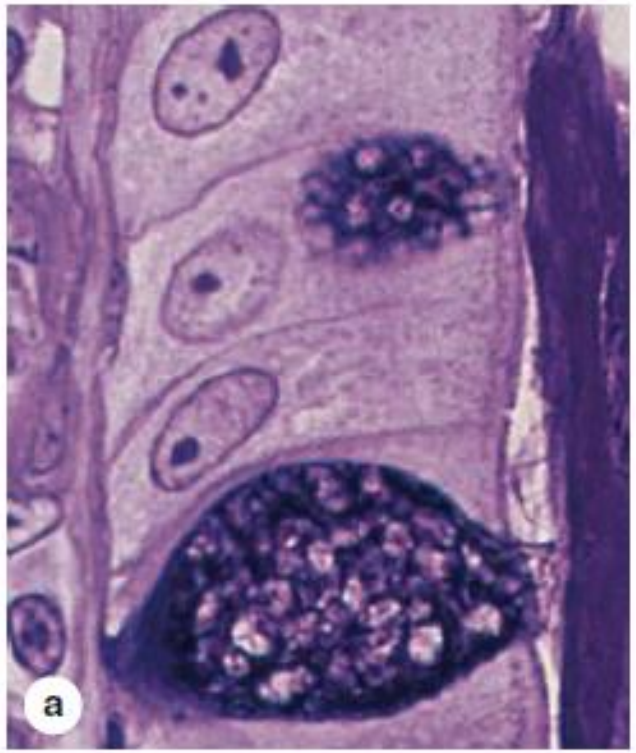
- Two layers only; basal cuboidal and apical columnar
- Very rare type
- Found in conjunctiva of eye

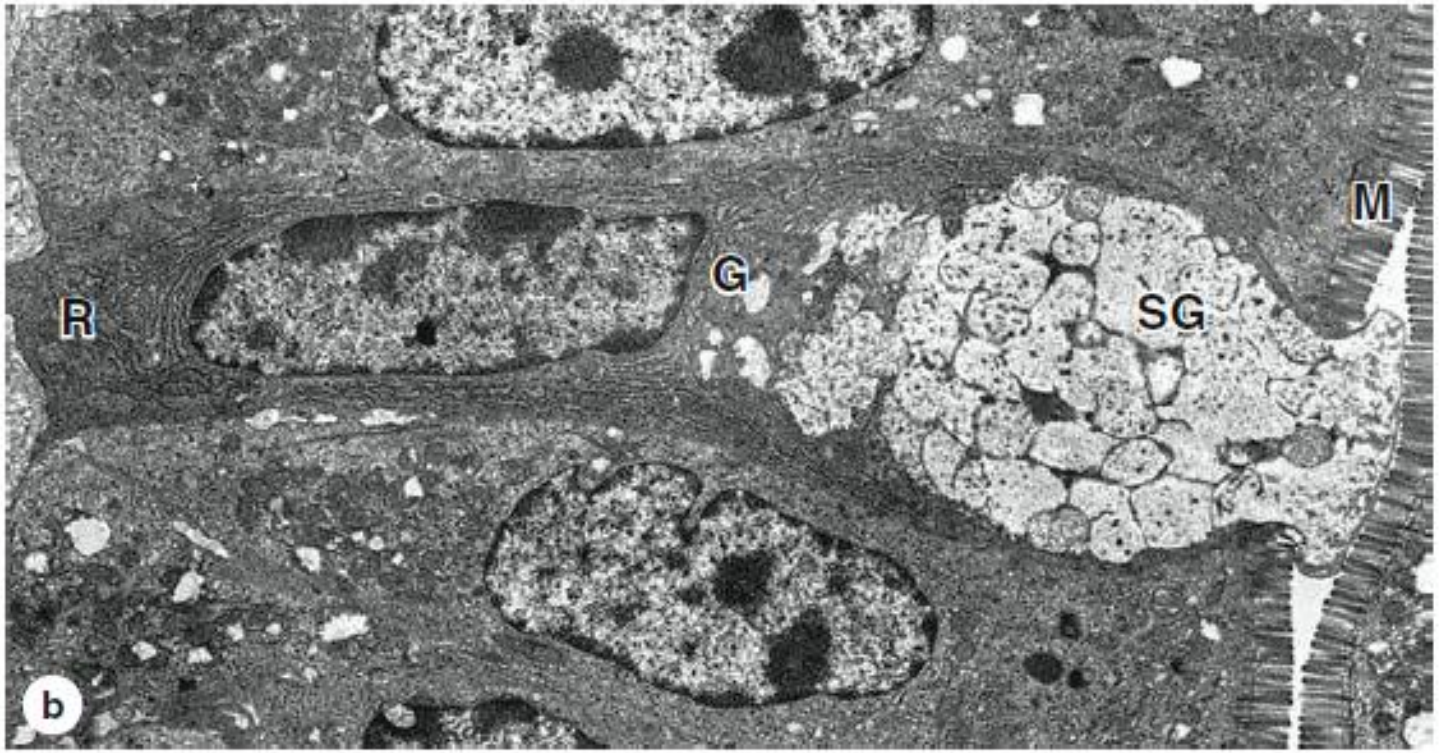
Un-stretched

Stretched



Goblet Cells





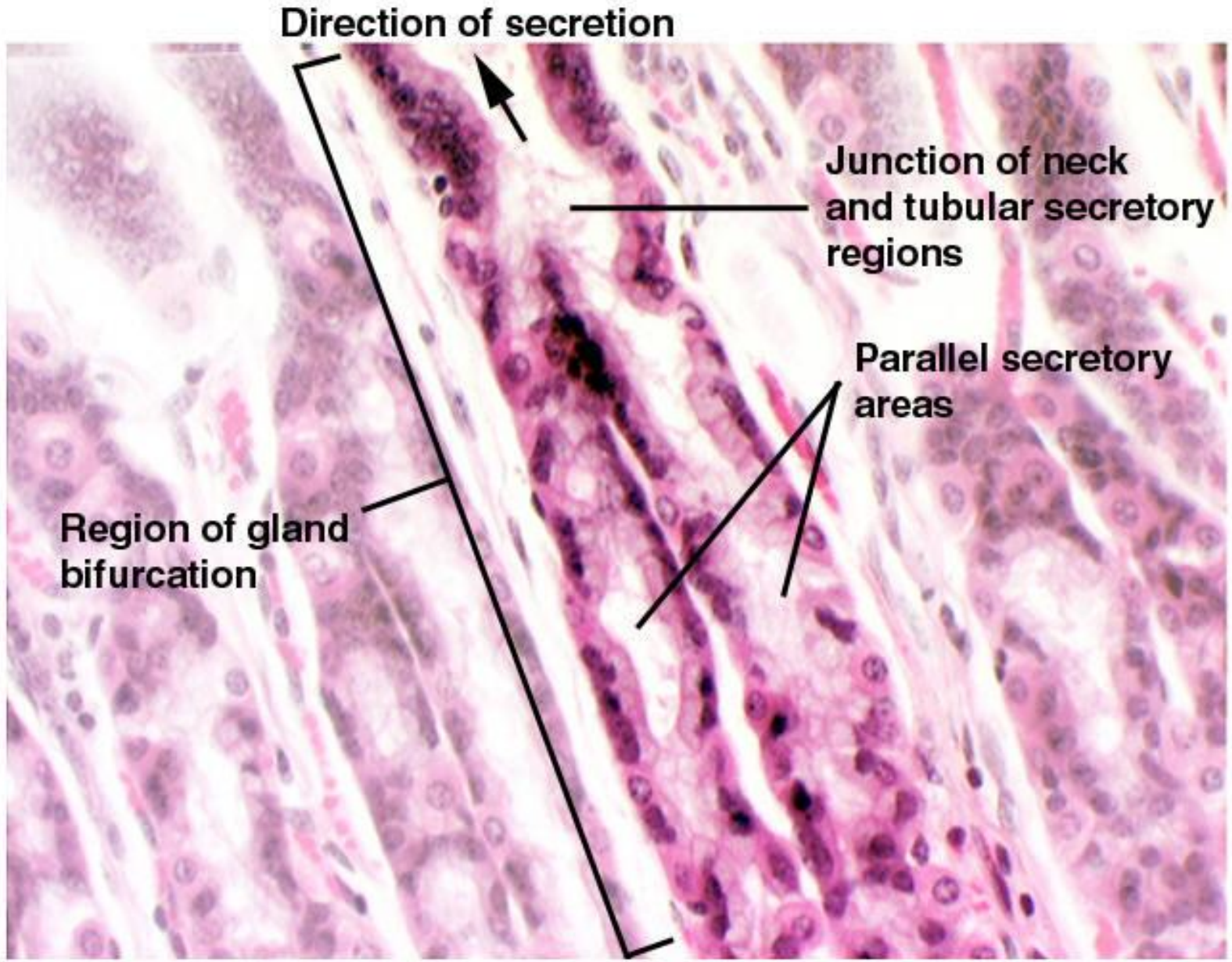

C
D

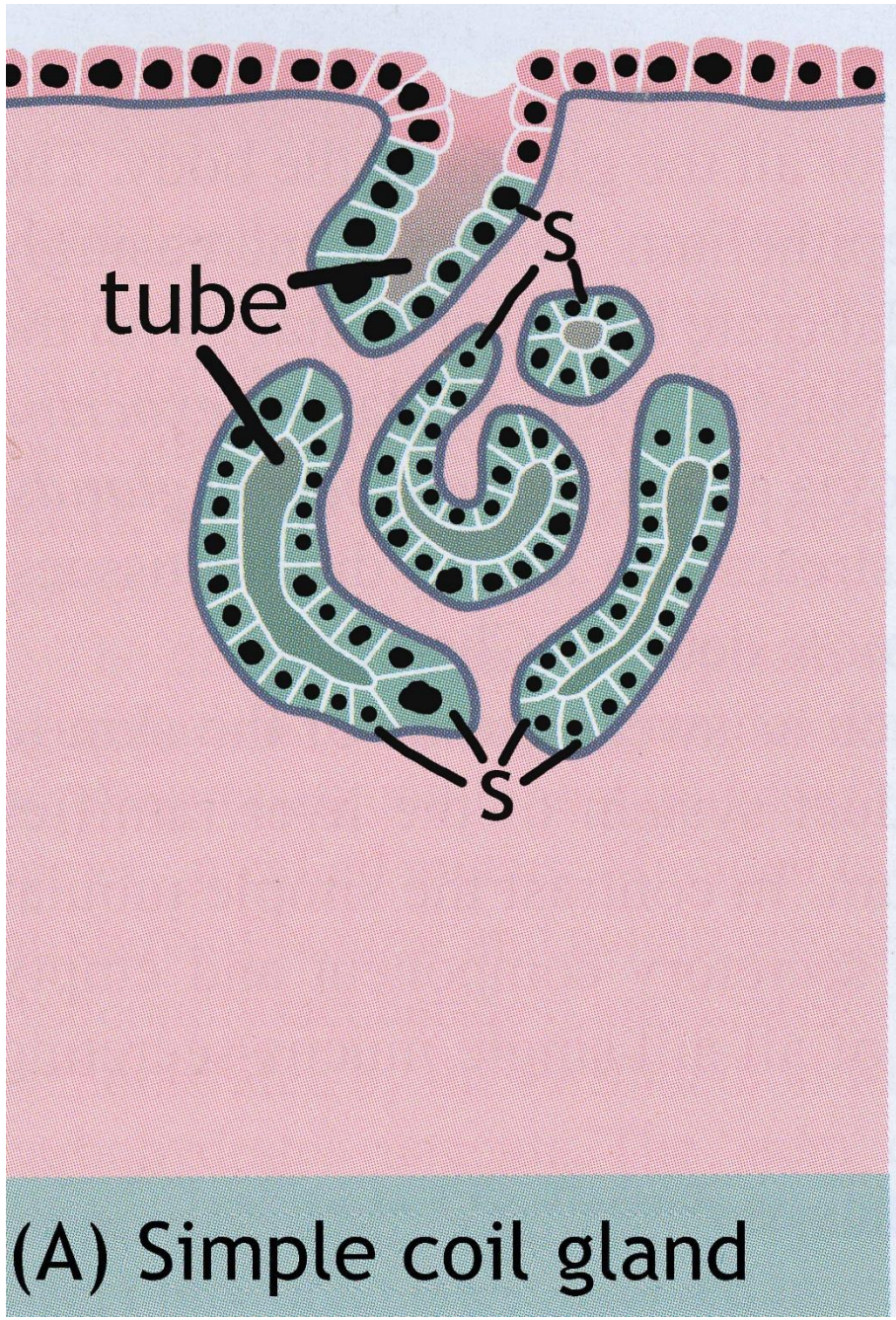
SIMPLE Glands (Ducts Do Not Branch)

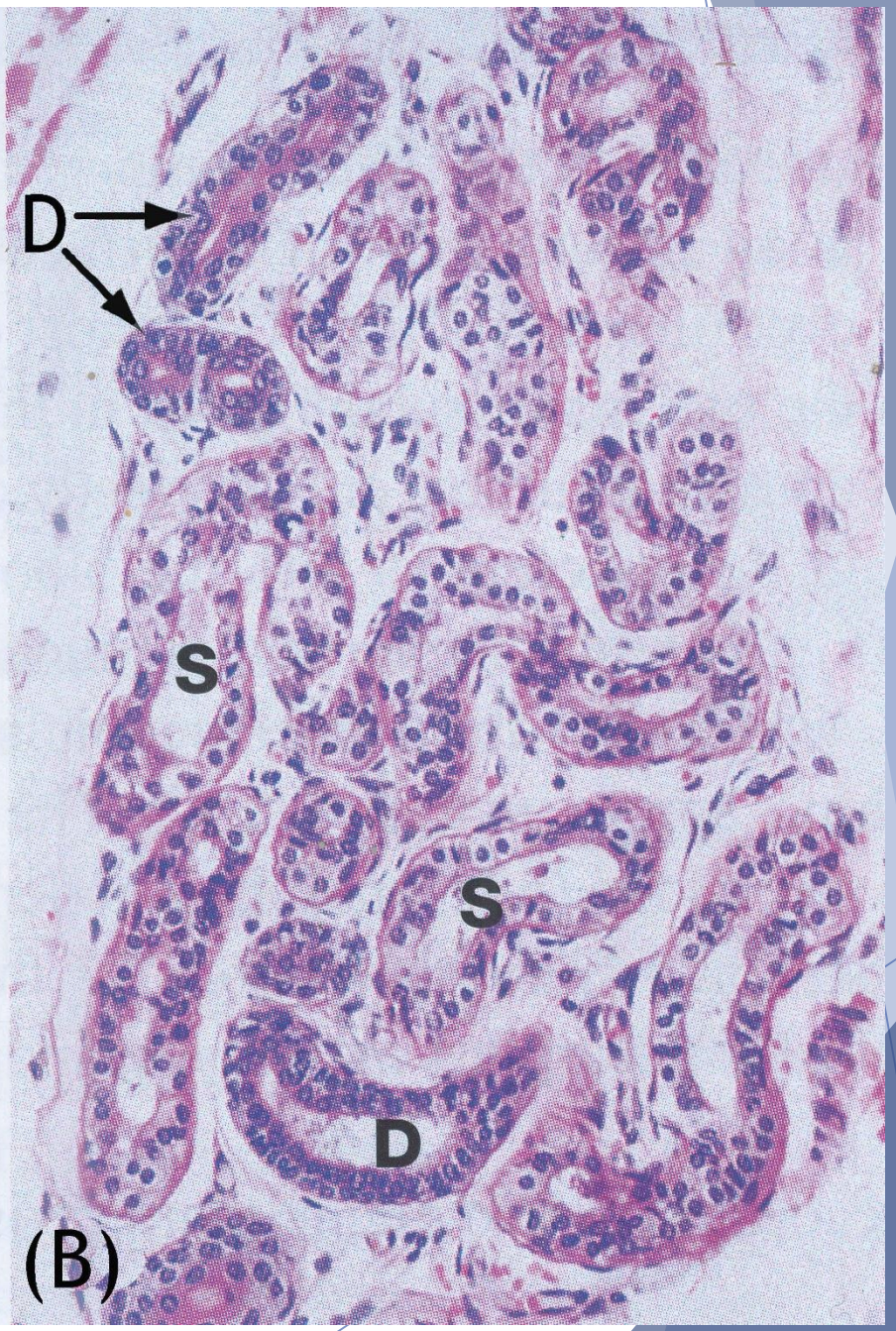
Class	Simple Tubular	Branched Tubular	Coiled Tubular	Acinar (or Alveolar)	Branched Acinar
					
Features	Elongated secretory portion; duct usually short or absent	Several long secretory parts joining to drain into 1 duct	Secretory portion is very long and coiled	Rounded, saclike secretory portion	Multiple saclike secretory parts entering the same duct
Examples	Mucous glands of colon; intestinal glands or crypts (of Lieberkühn)	Glands in the uterus and stomach	Sweat glands	Small mucous glands along the urethra	Sebaceous glands of the skin

Simple Tubular Glands

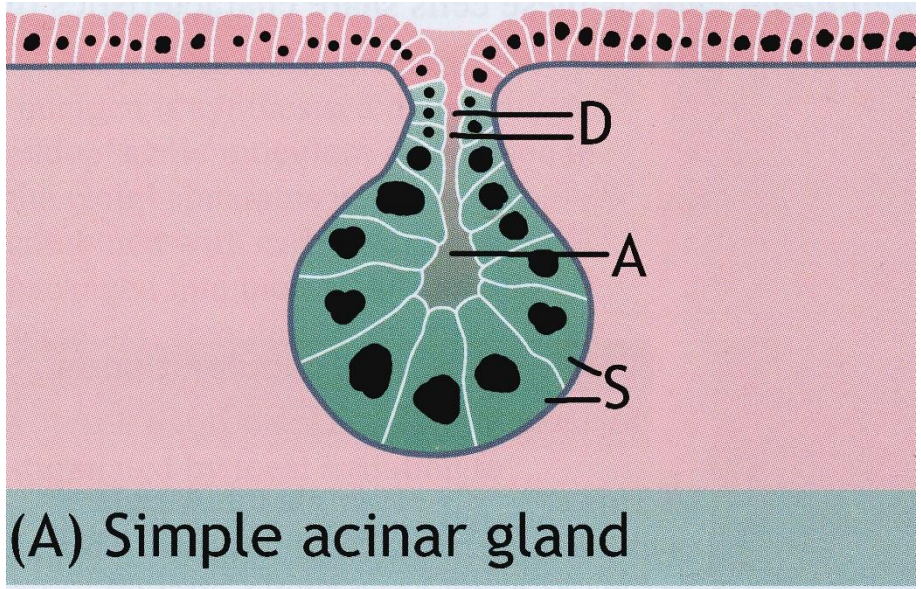
Branched Tubular

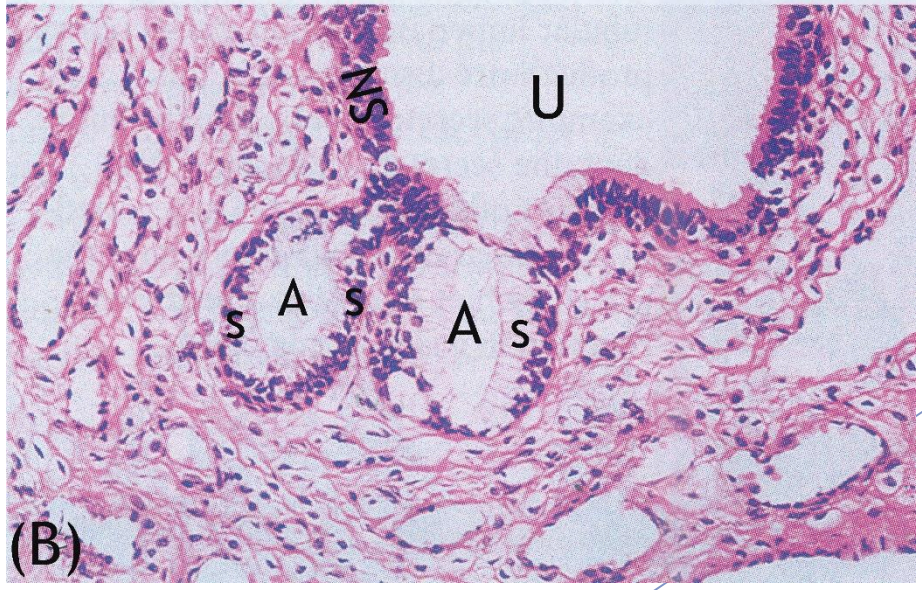


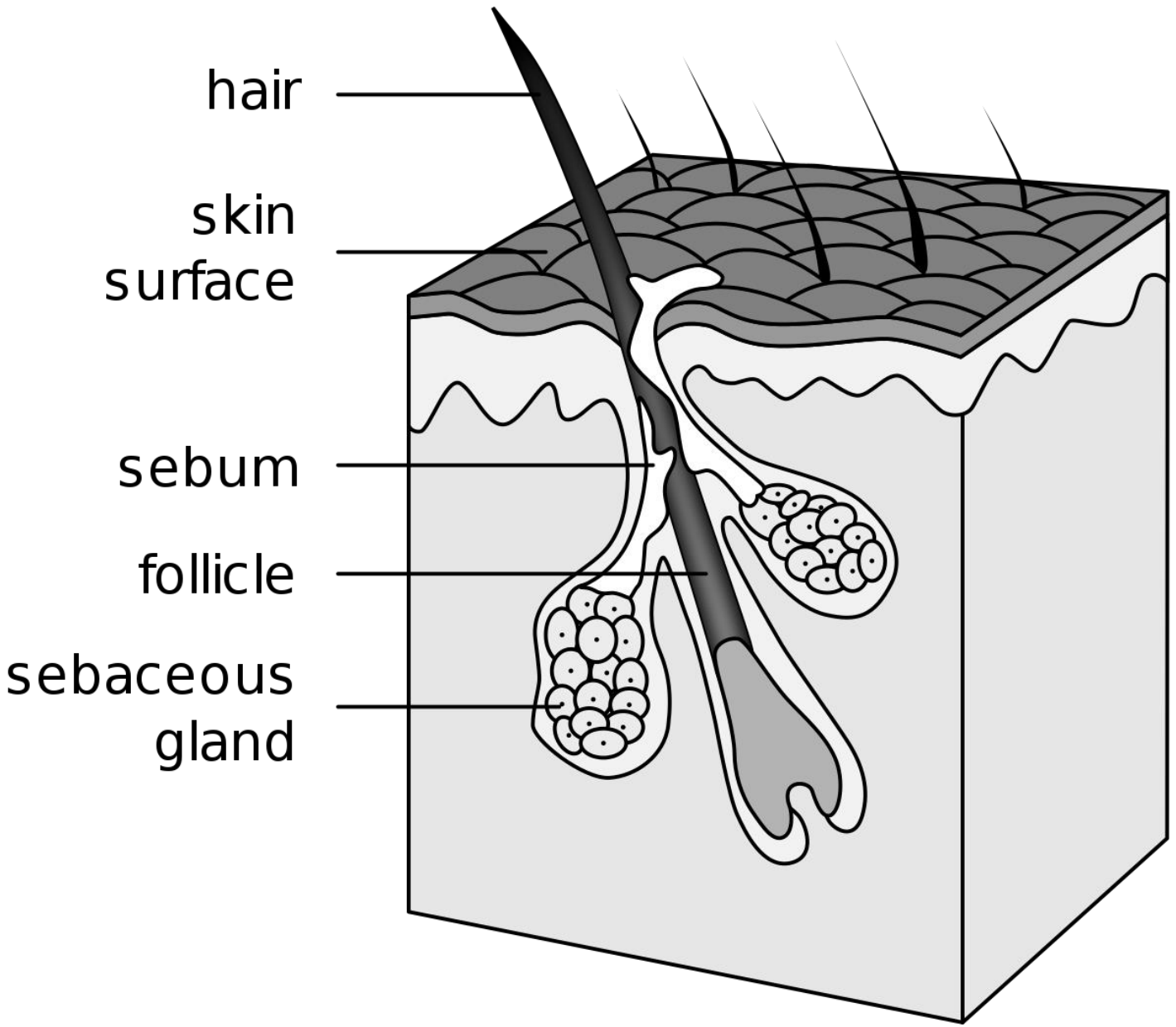

tube
S
S
(A) Simple coil gland


D
S
S
D
(B)

Simple acinar (alveolar)

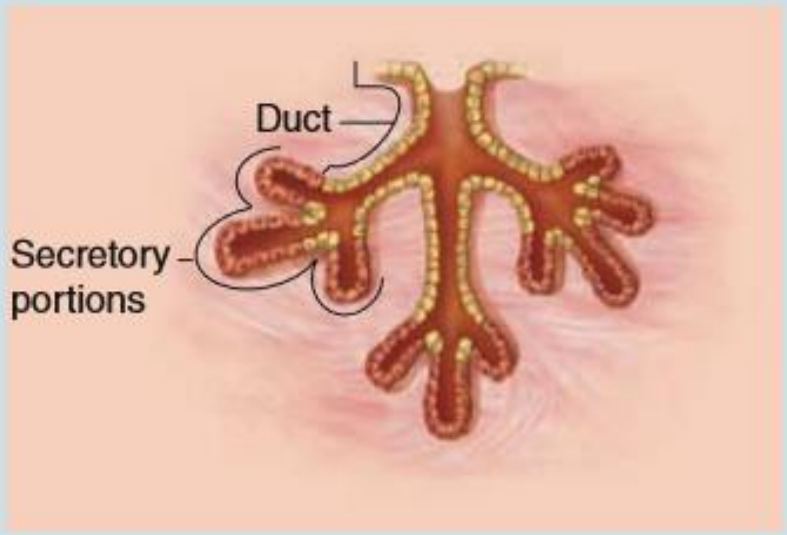




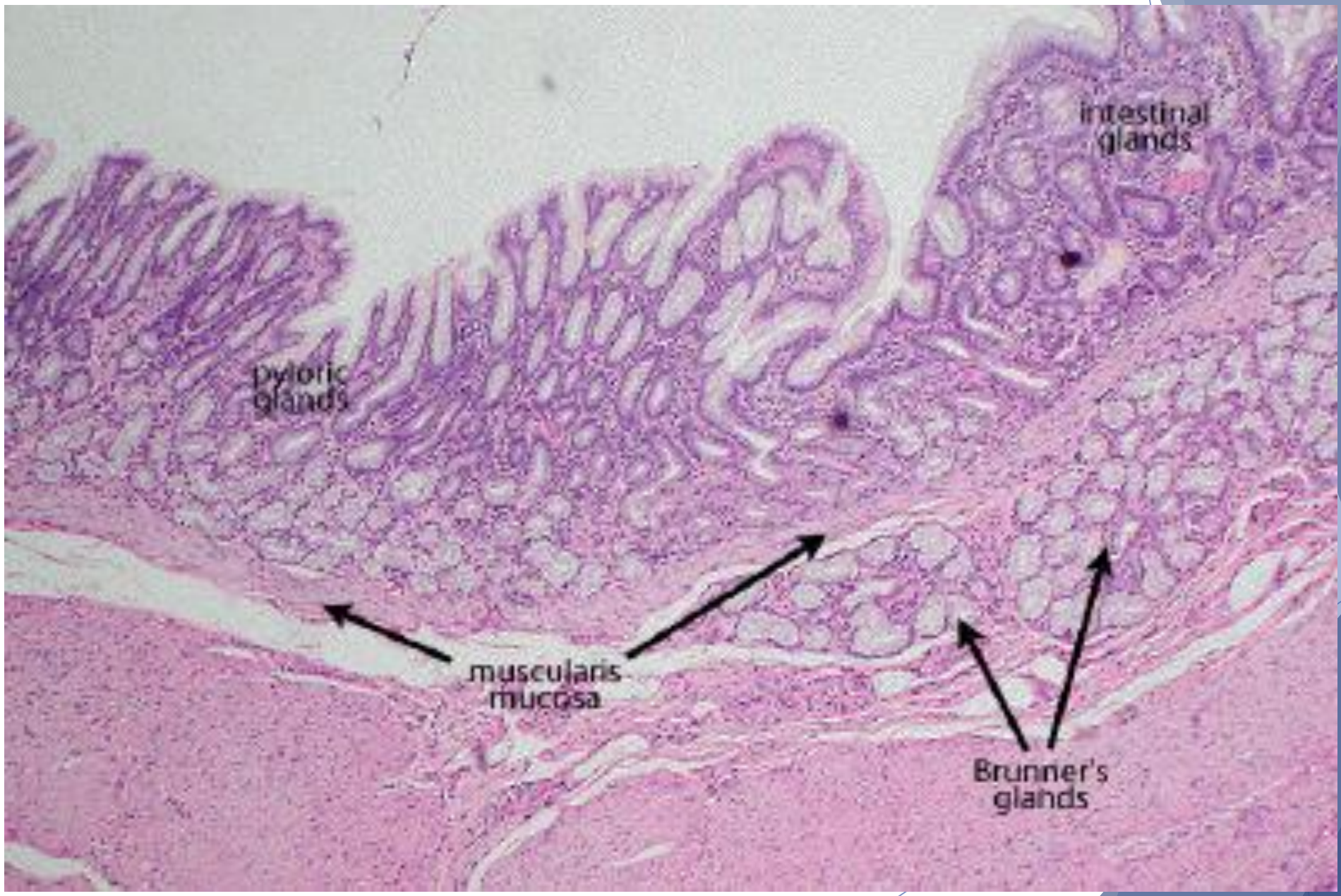

hair
skin surface
sebum
follicle
sebaceous gland


outer root sheath
hair canal

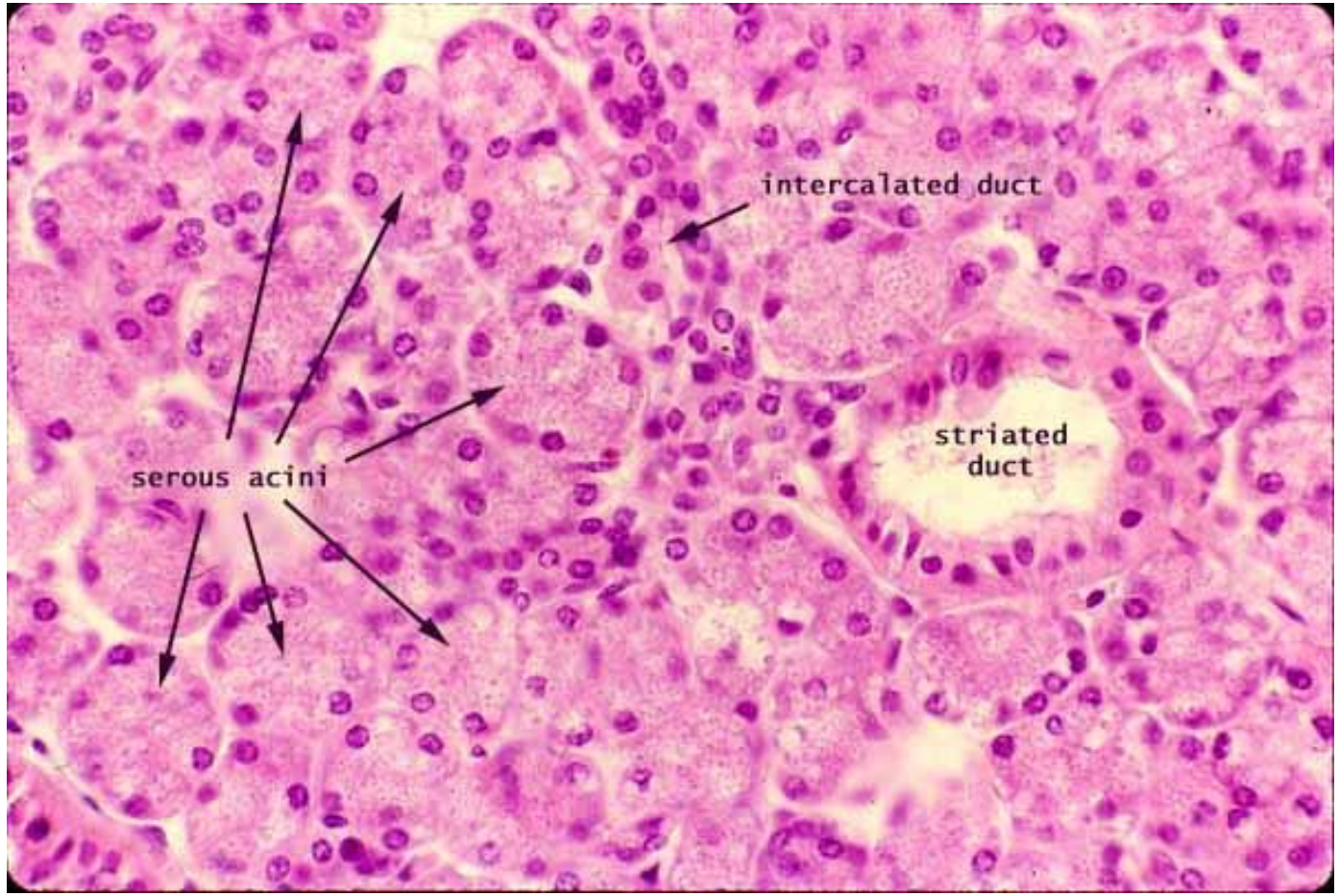
COMPOUND Glands (Ducts from Several Secretory Units Converge into Larger Ducts)

Class	Tubular	Acinar (Alveolar)	Tubuloacinar
			
Features	Several *elongated* coiled secretory units and their ducts converge to form larger ducts	Several *saclike* secretory units with small ducts converge at a larger duct	Ducts of both tubular and acinar secretory units converge at larger ducts
Examples	Submucosal mucous glands (of Brunner) in the duodenum	Exocrine pancreas	Salivary glands

Compound tubular



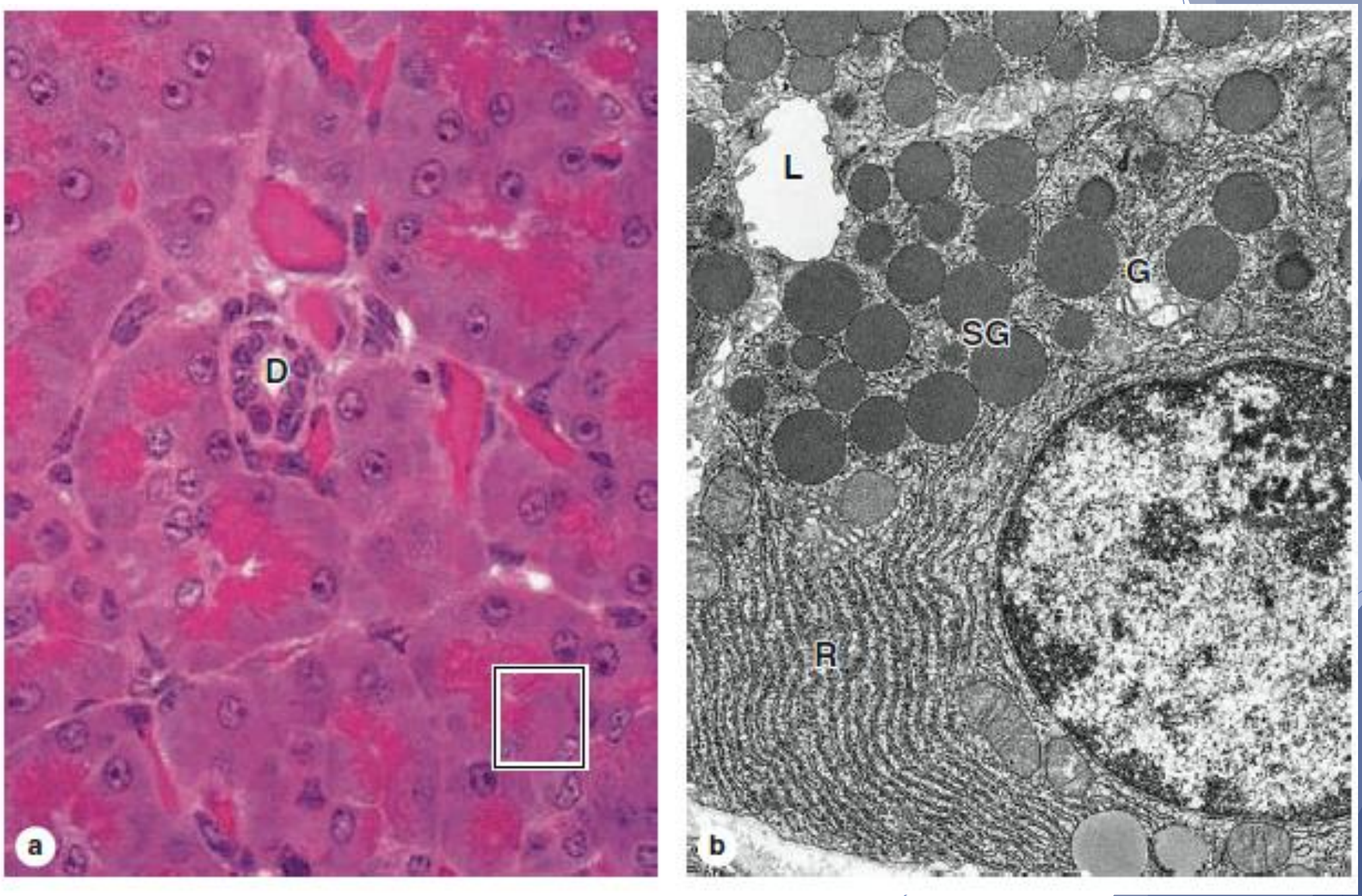
Compound acinar (alveolar)



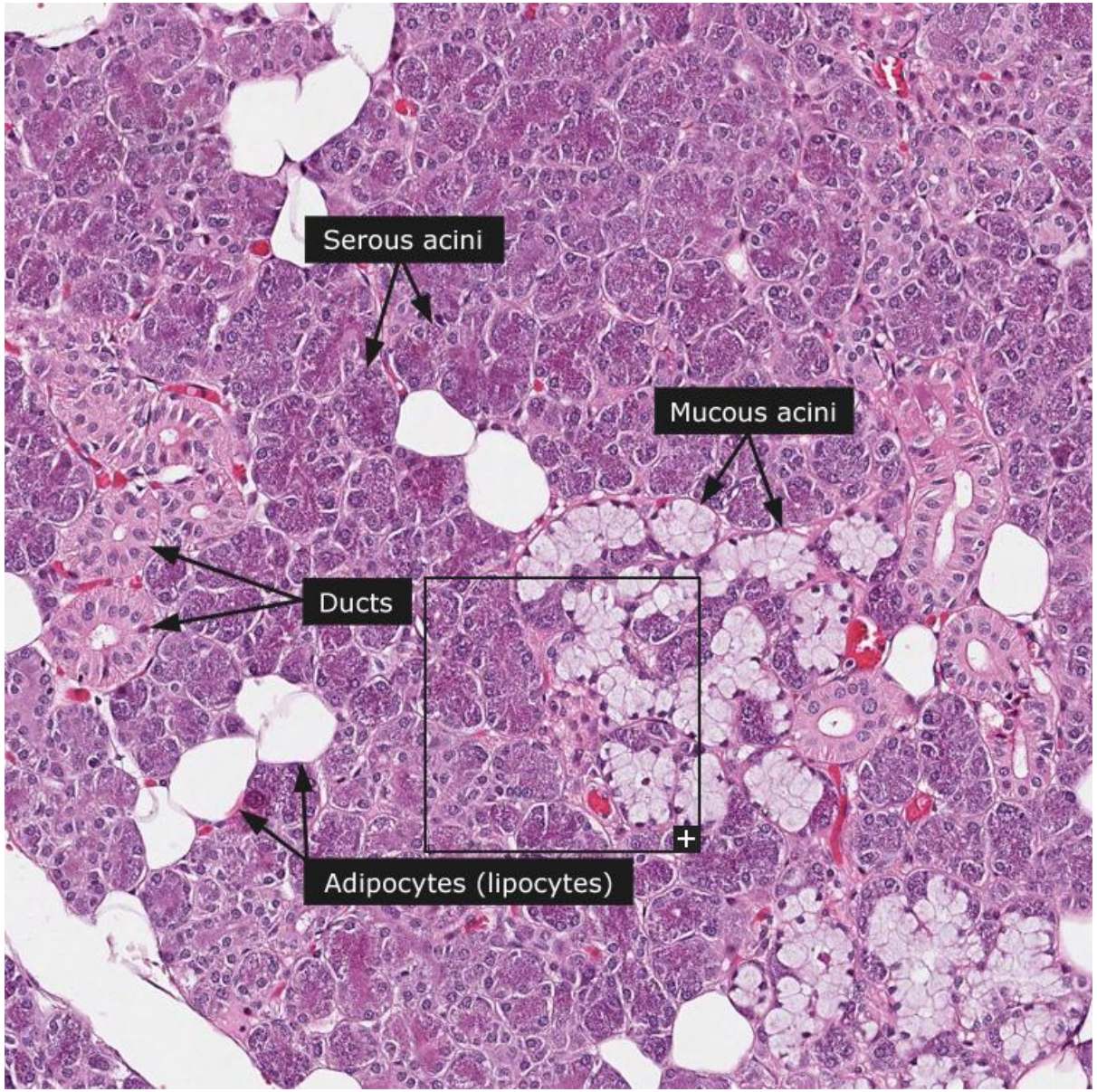
Acinar (Alveolar)

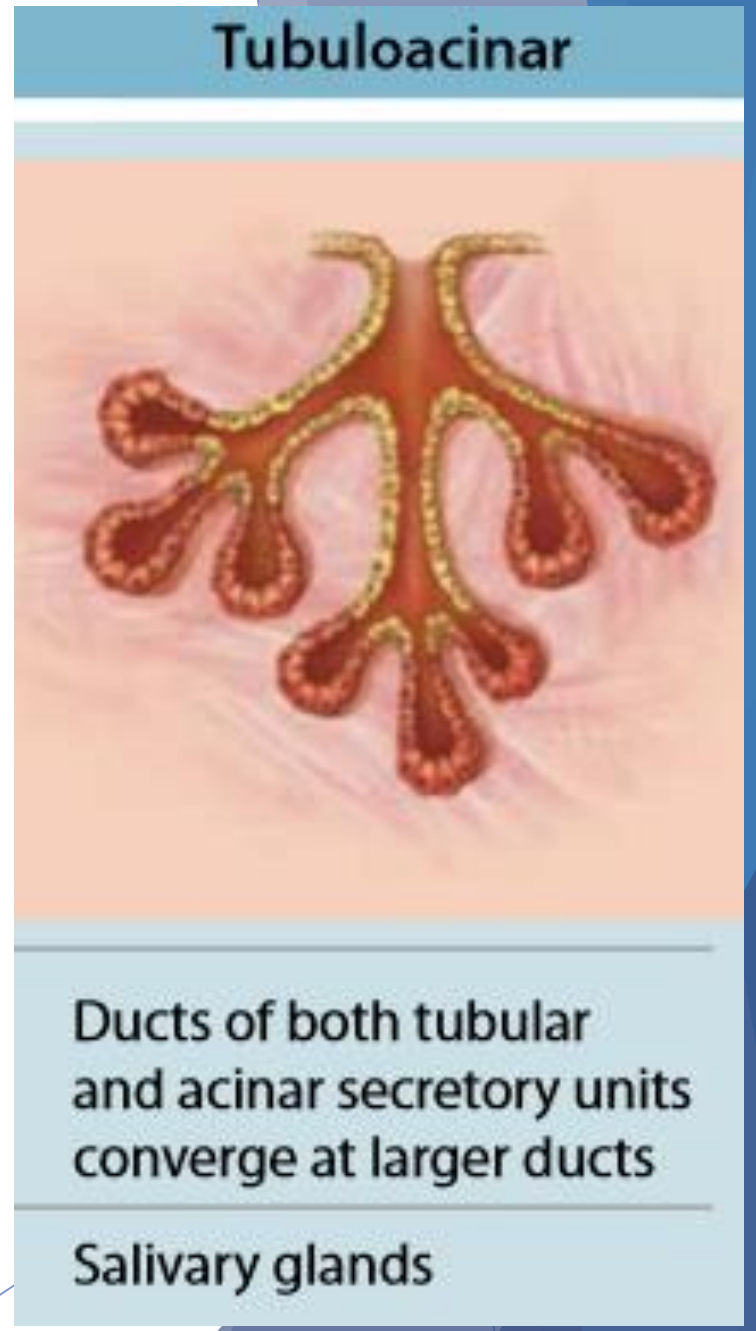
Several *saclike* secretory units with small ducts converge at a larger duct

Exocrine pancreas

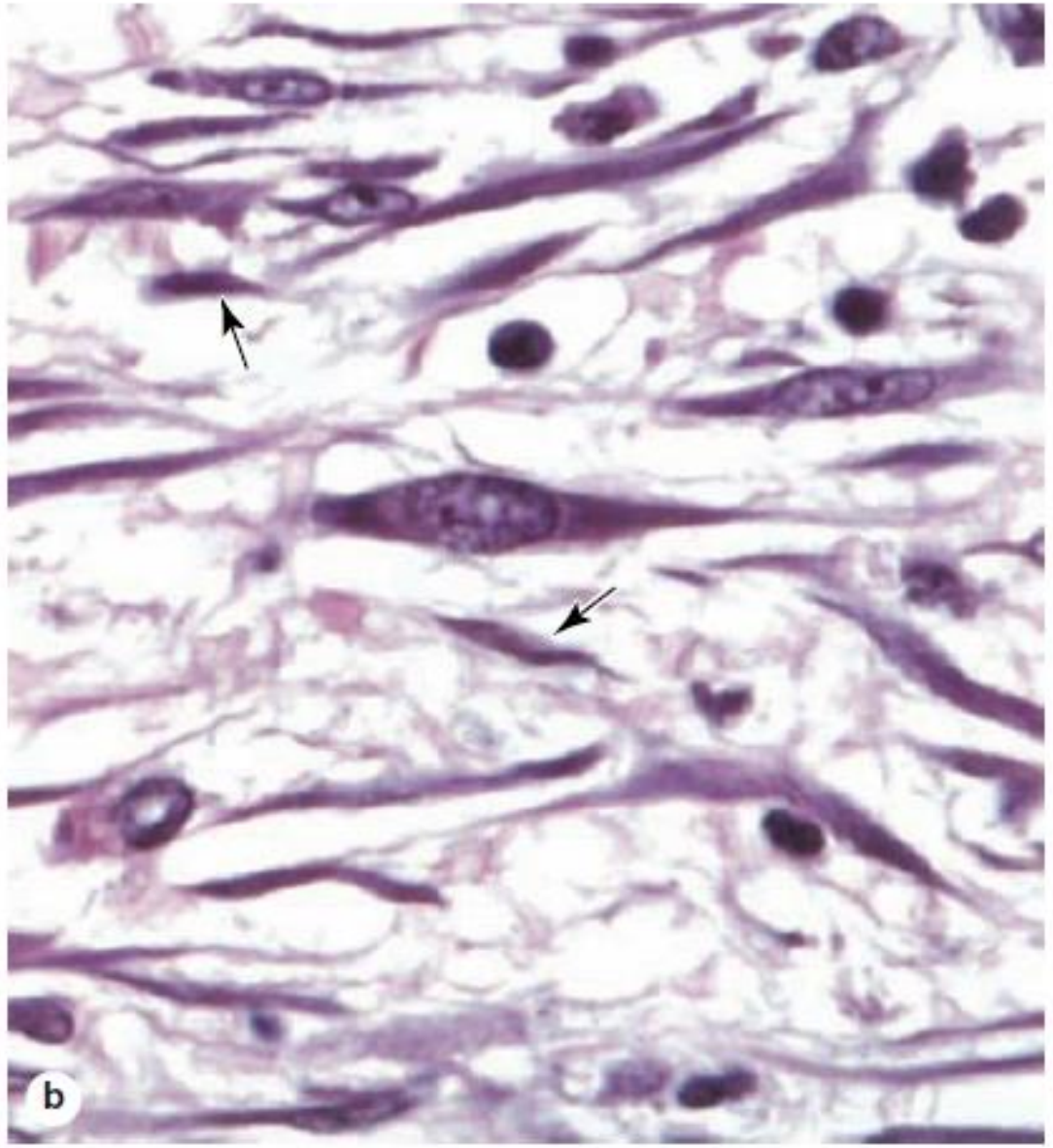

D
a
L
G
SG
R
b

Compound tubuloacinar

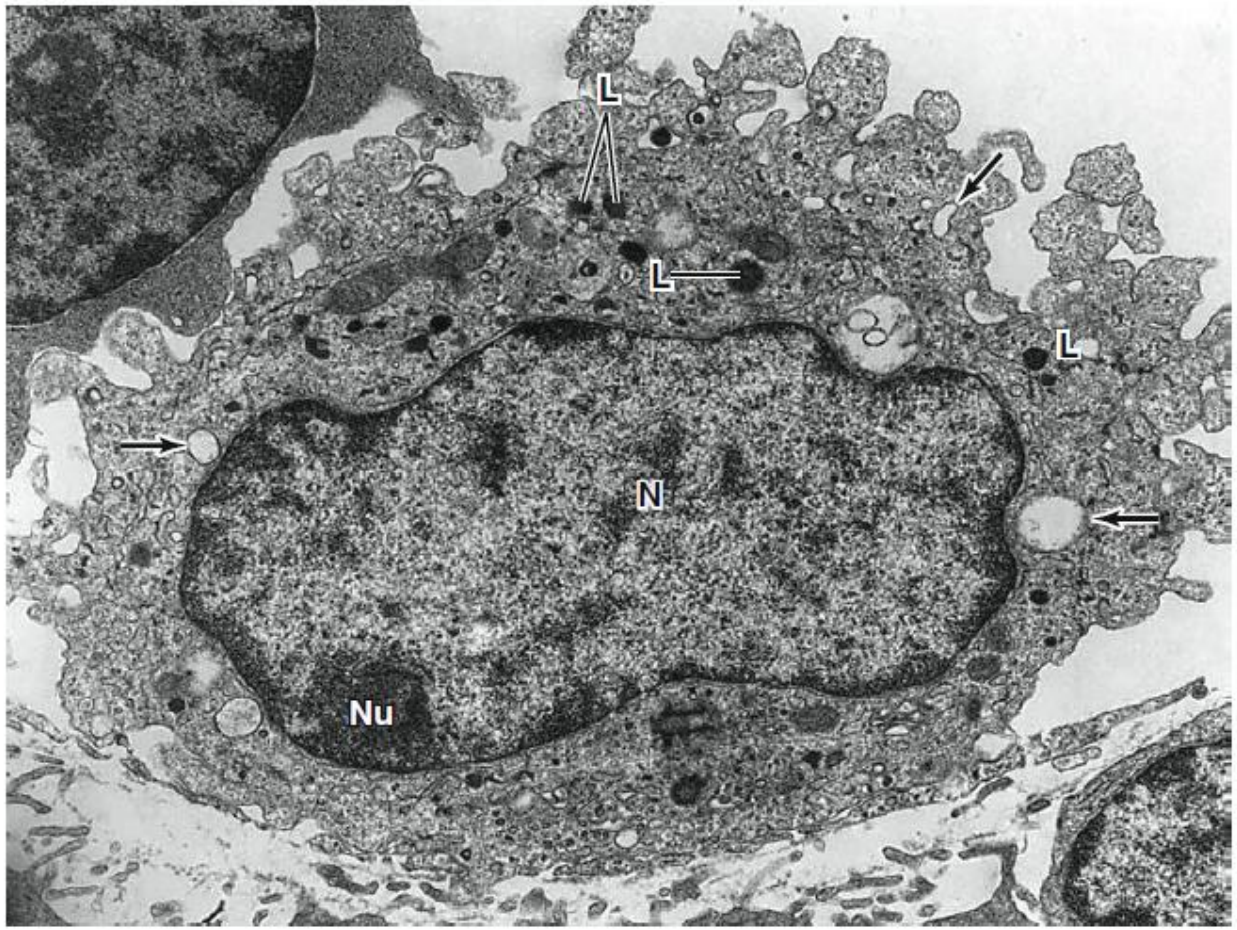




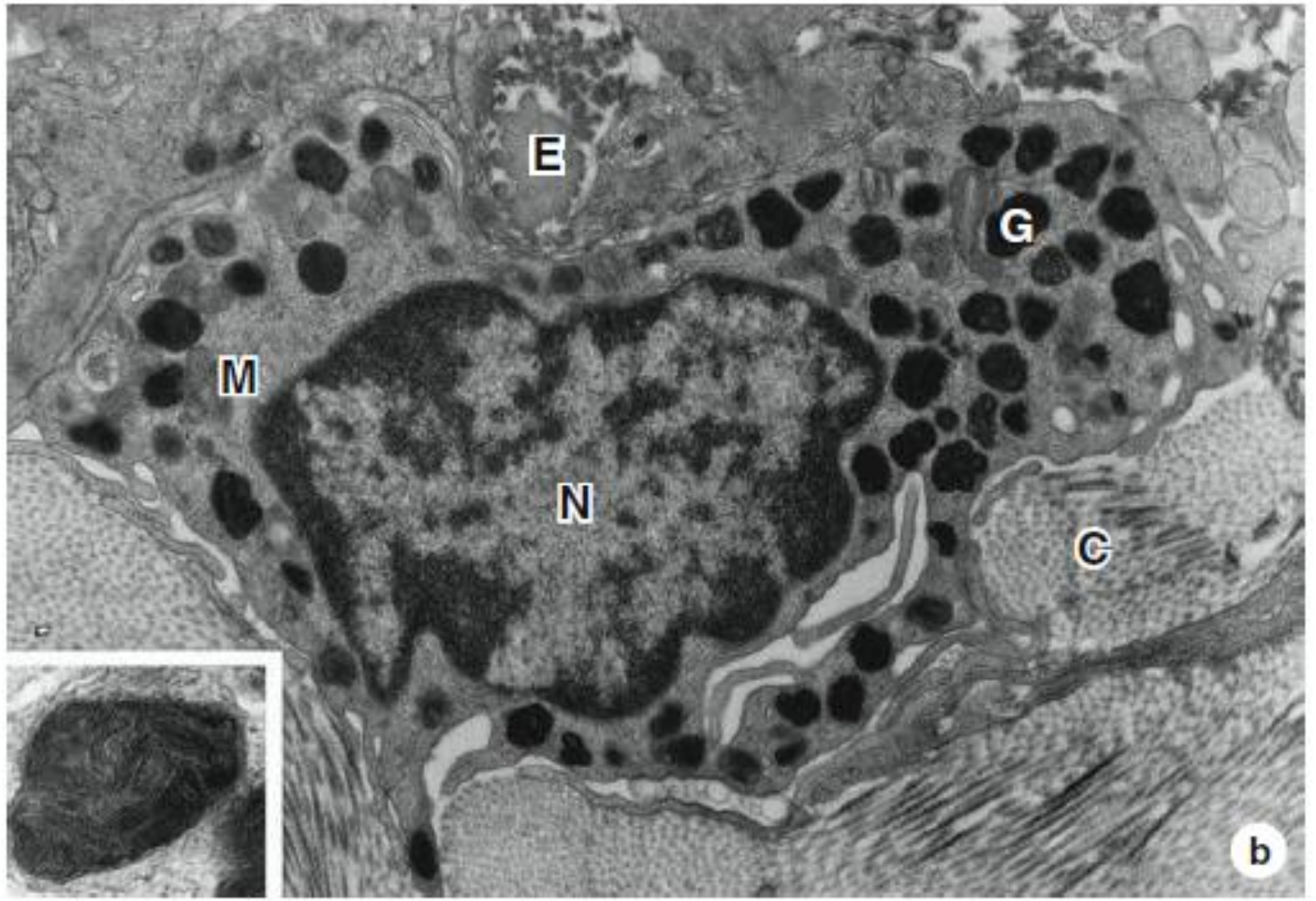
Finroblasts vs Fibrocytes



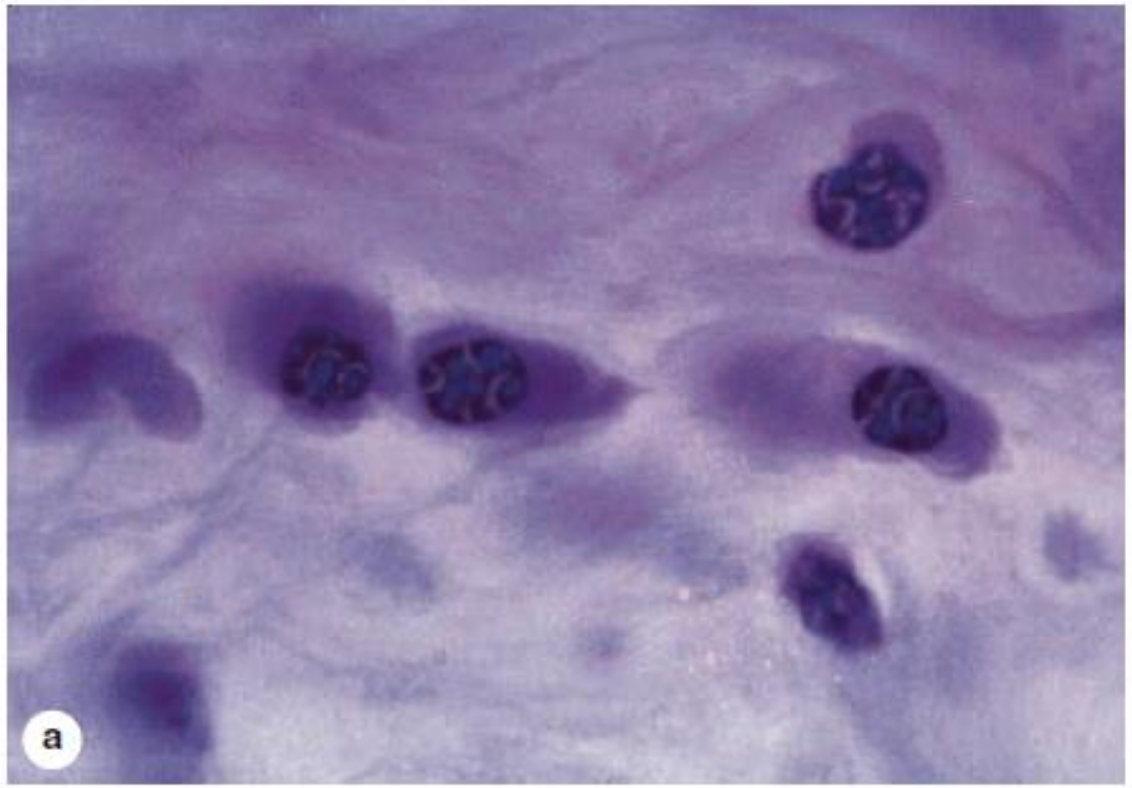
Macrophage

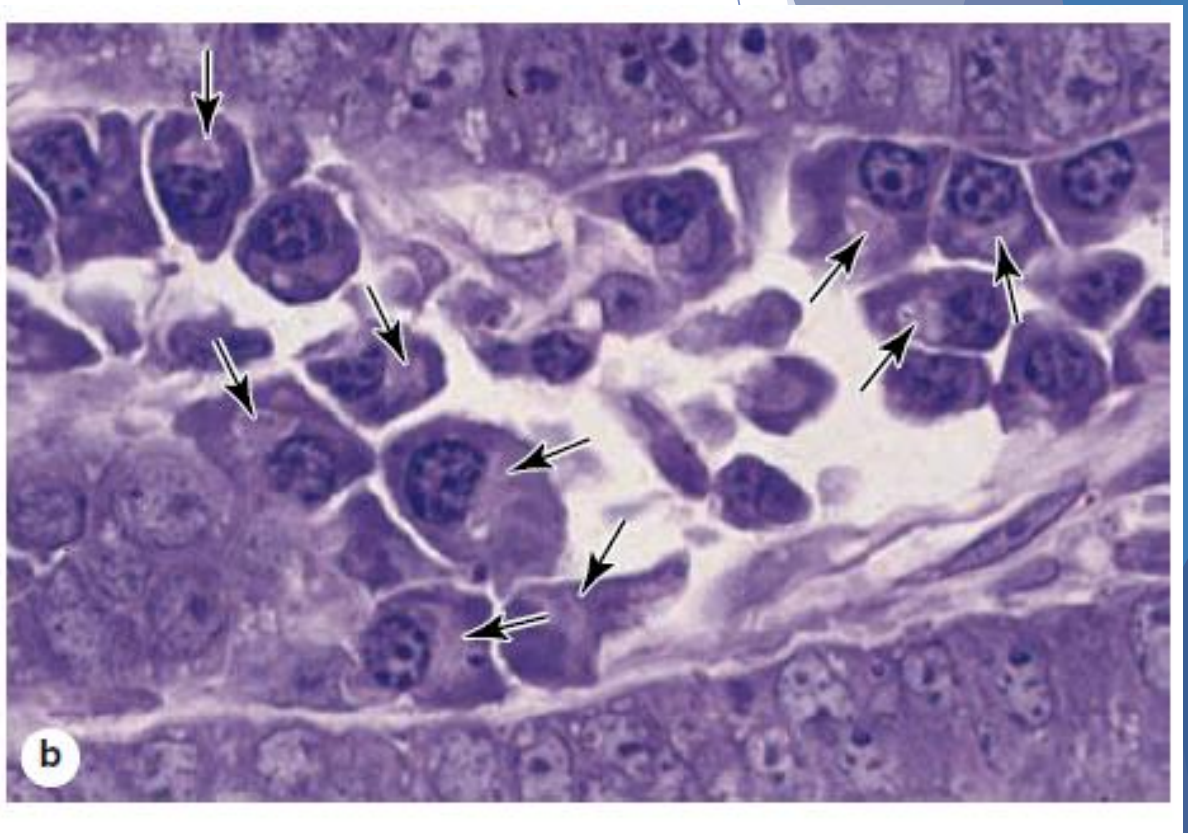


Mast cell

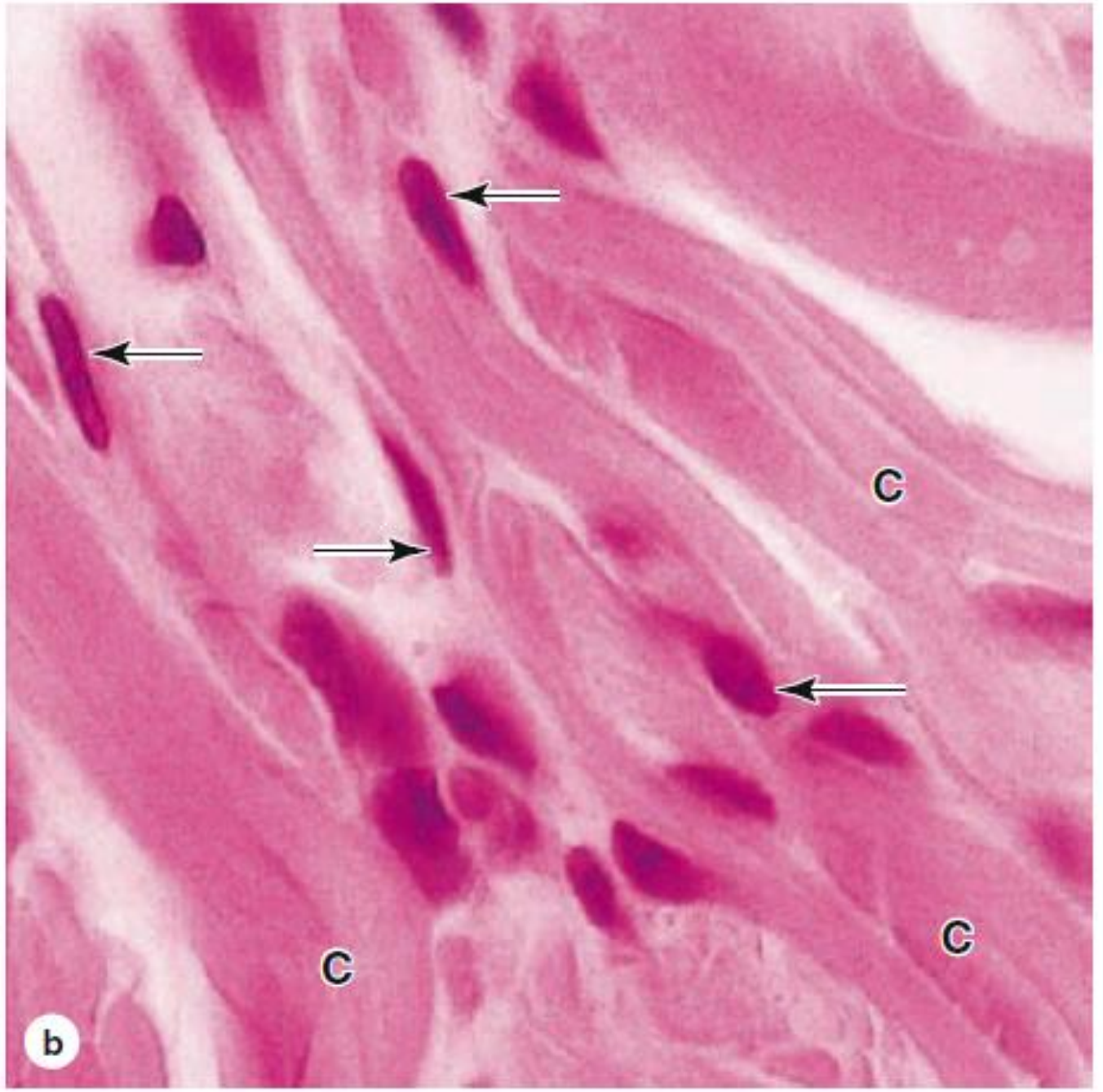


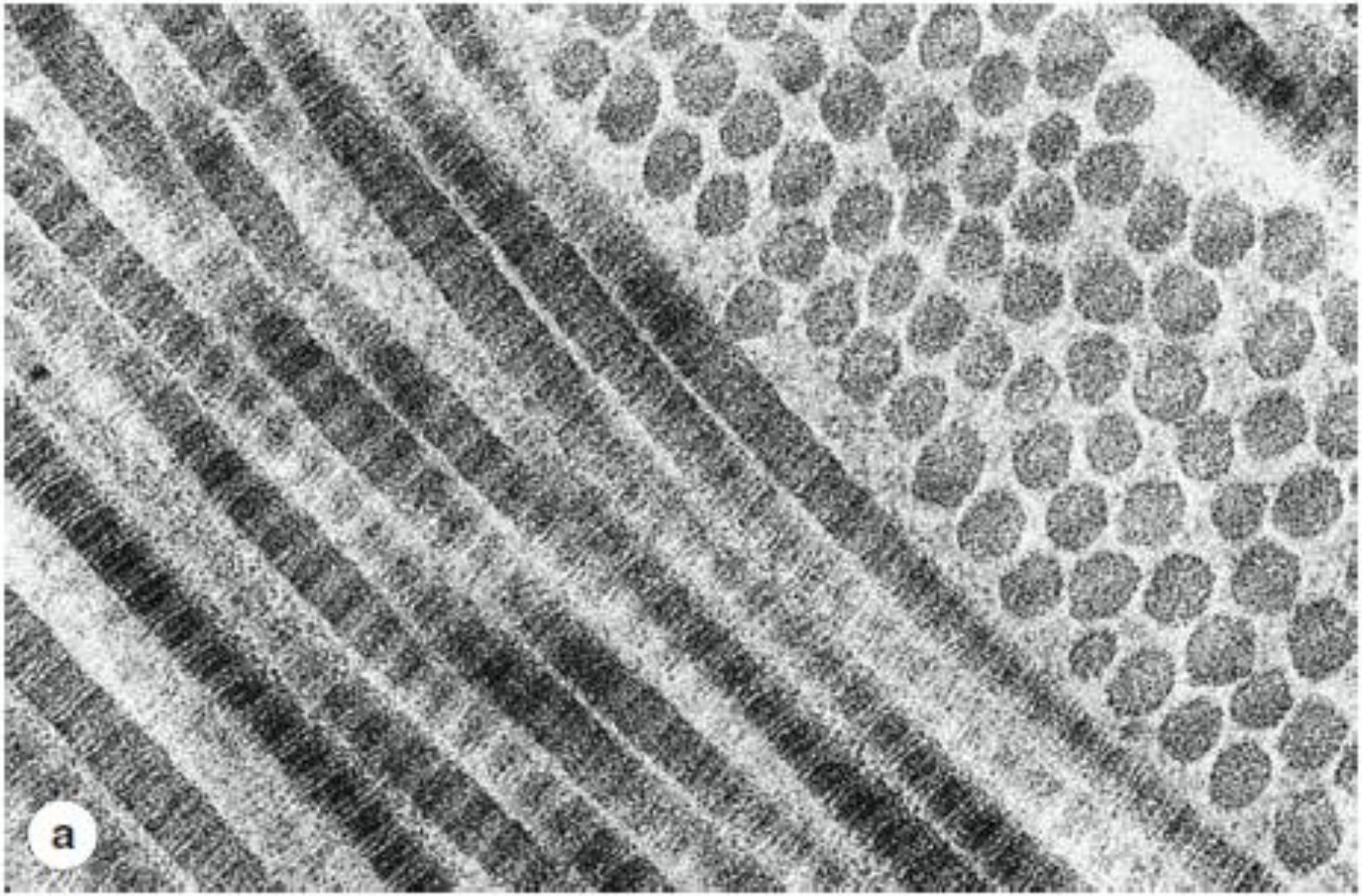
Plasma cells



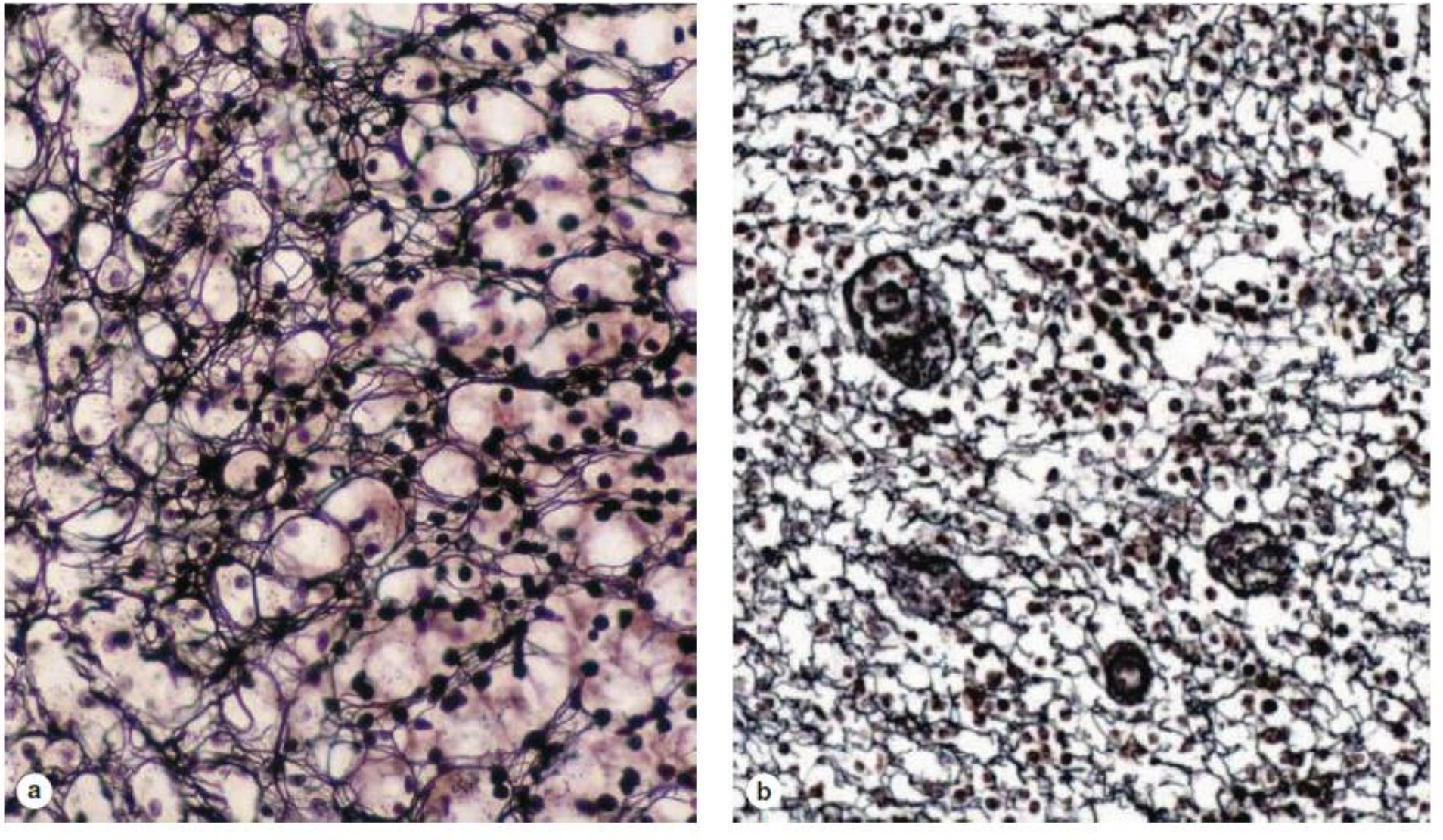


Collagen Fibers

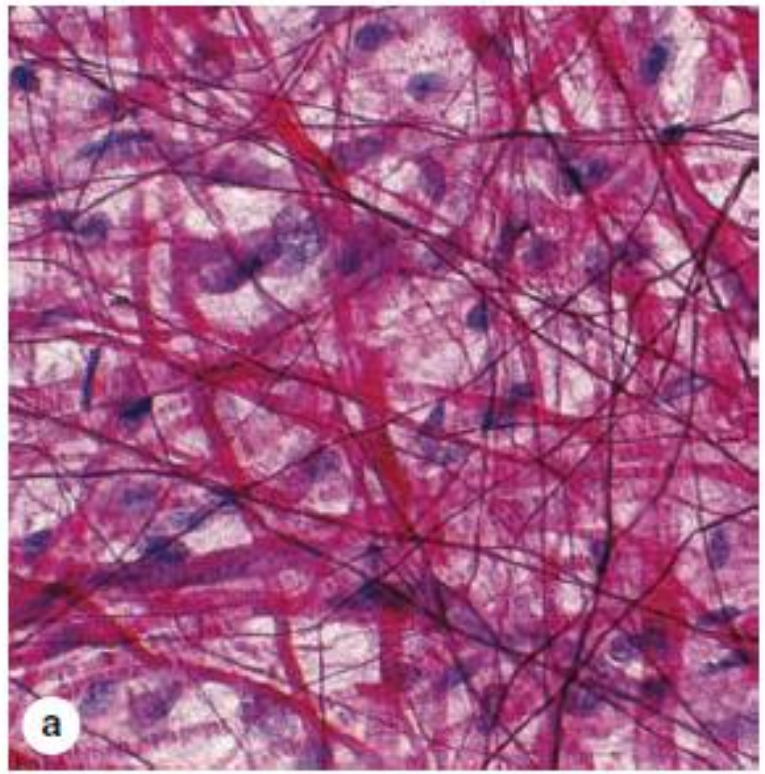


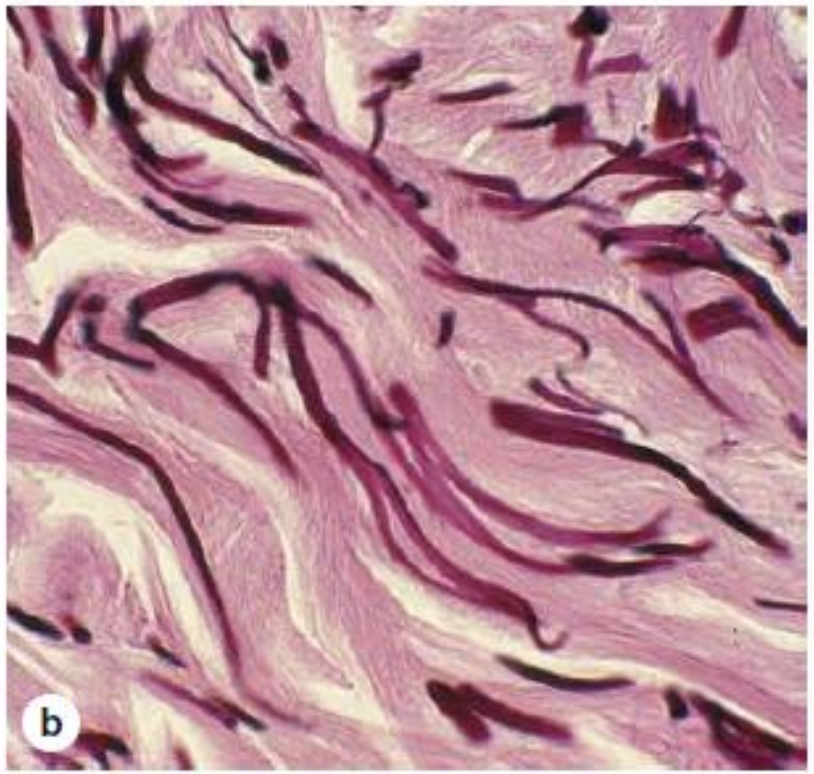

a

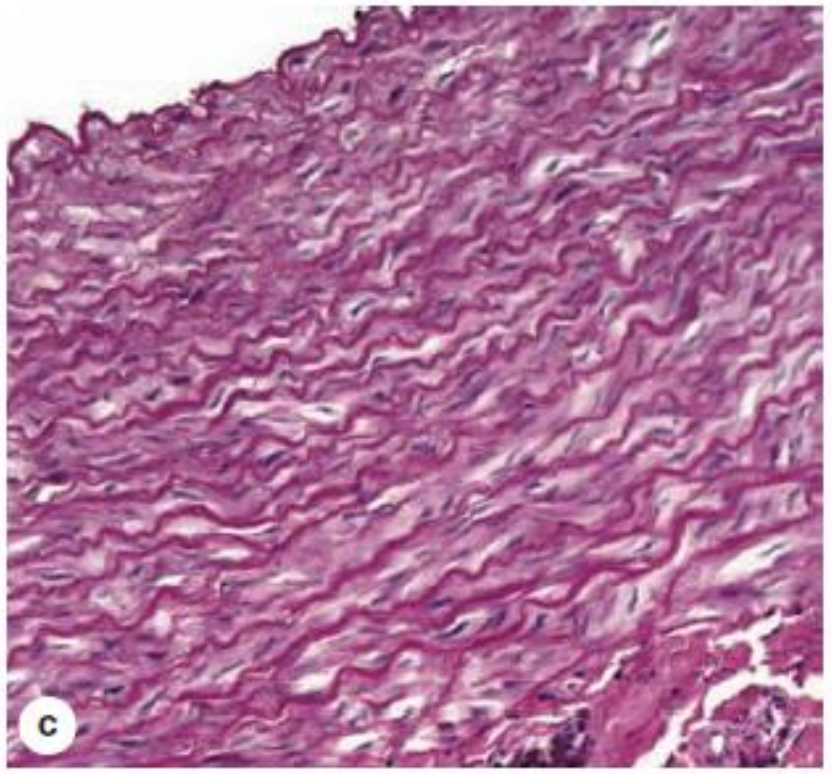
Reticular fibers-Silver stain

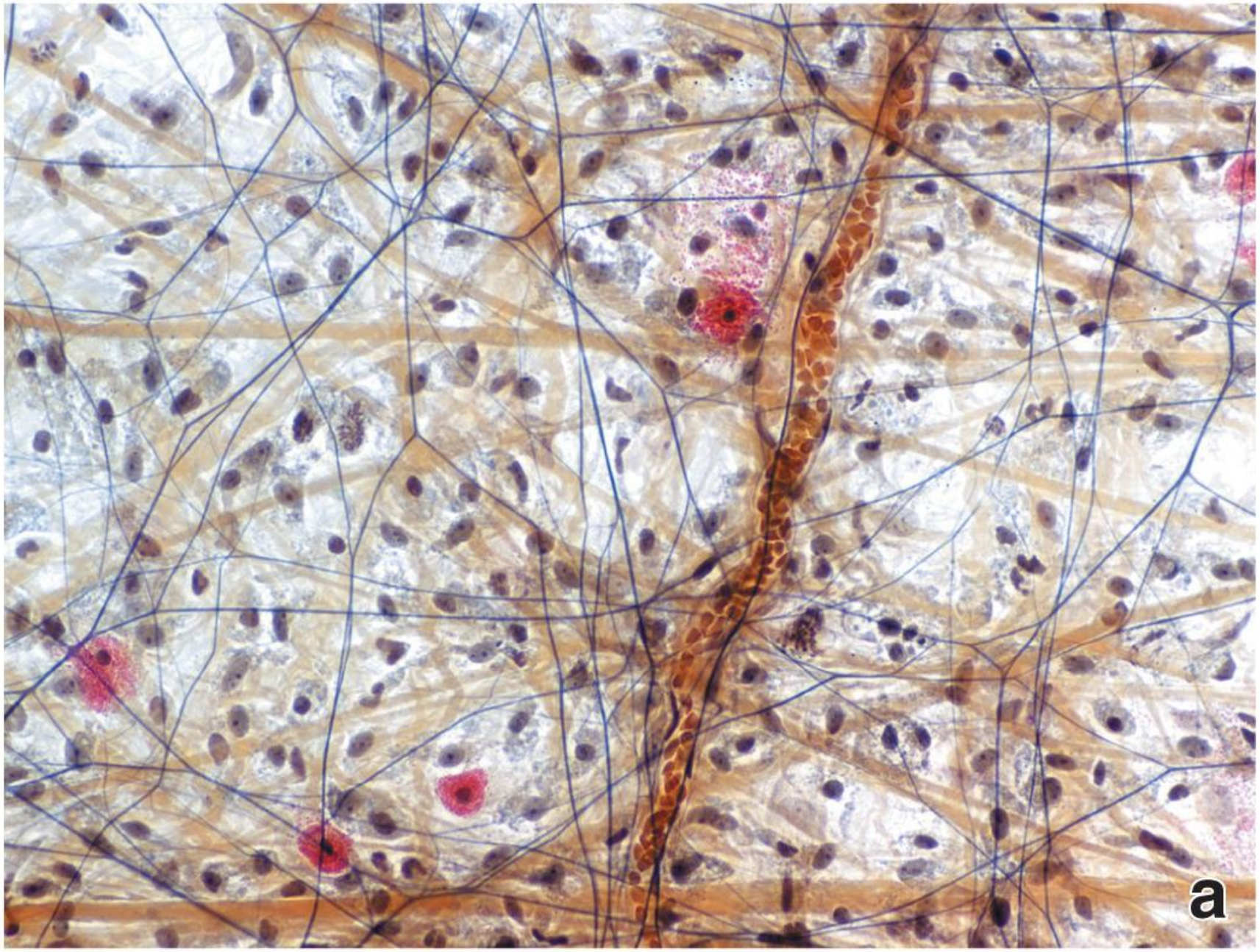


Elastic Fibers





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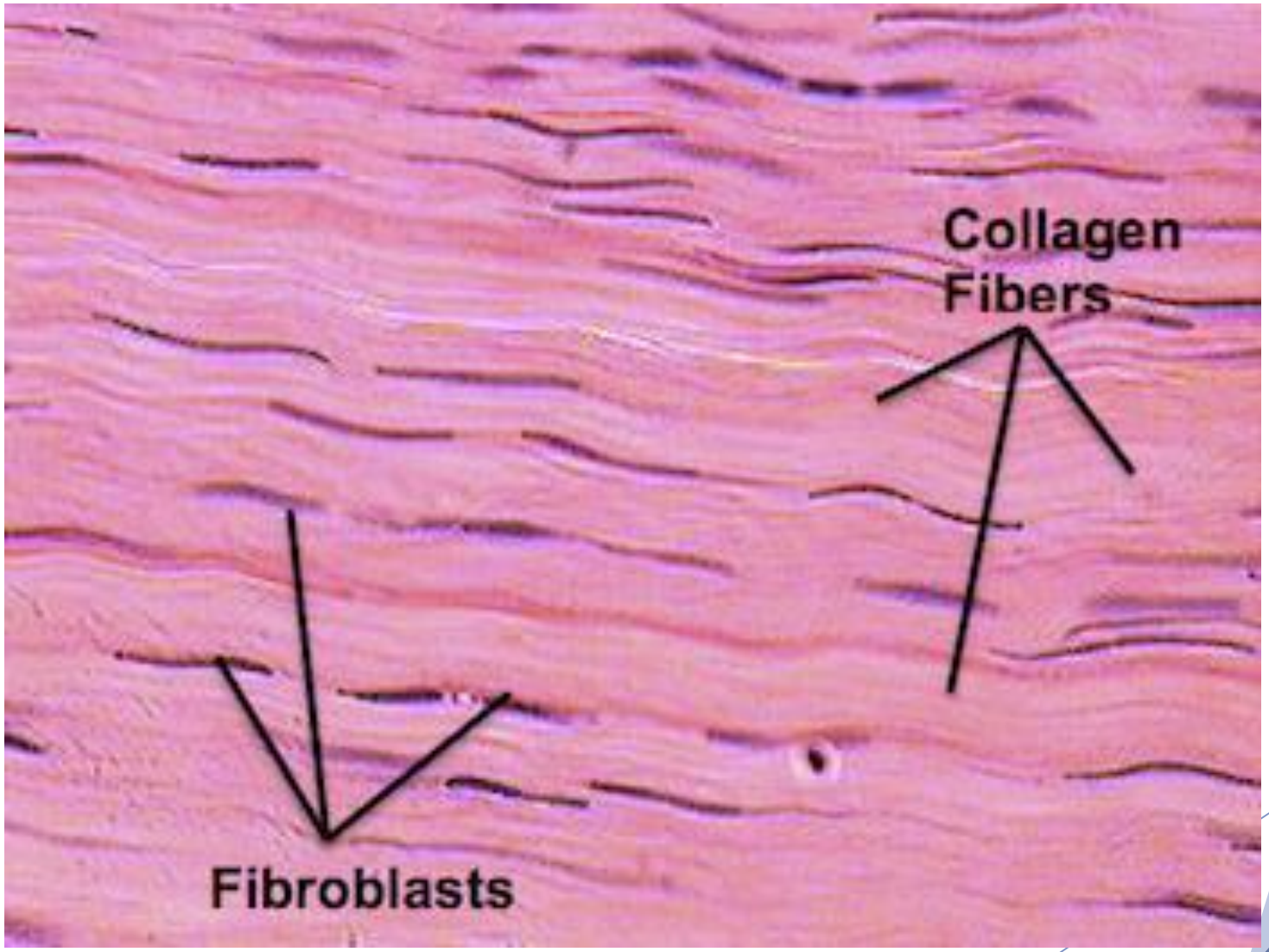
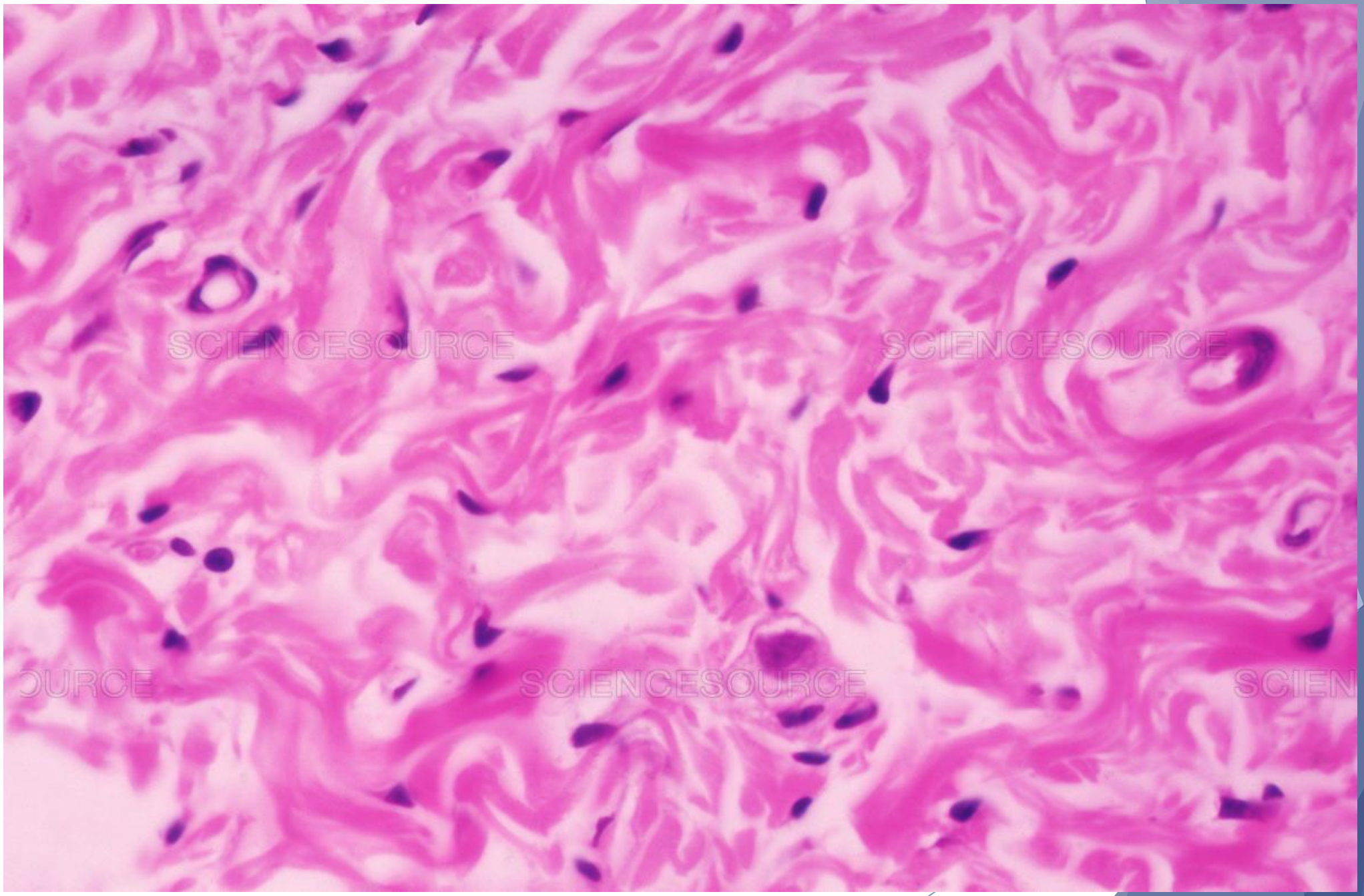

Collagen
Fibers
Fibroblasts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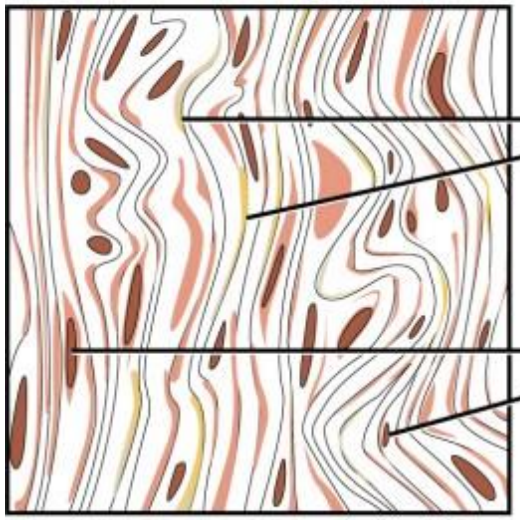
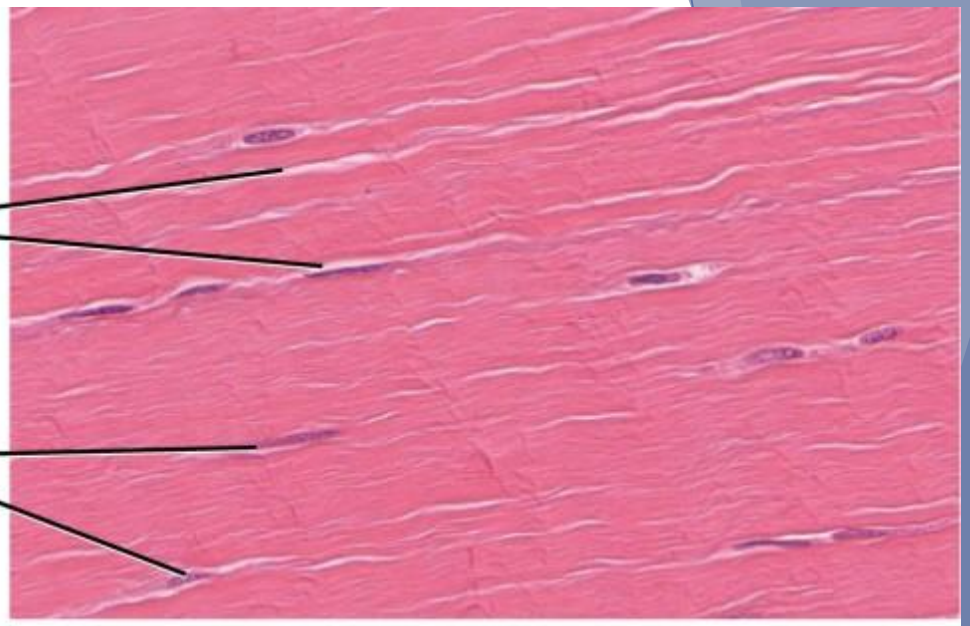
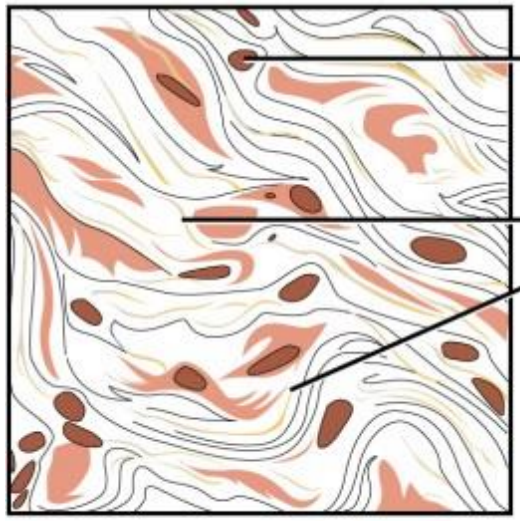


Collagen fibers

Fibroblast nuclei

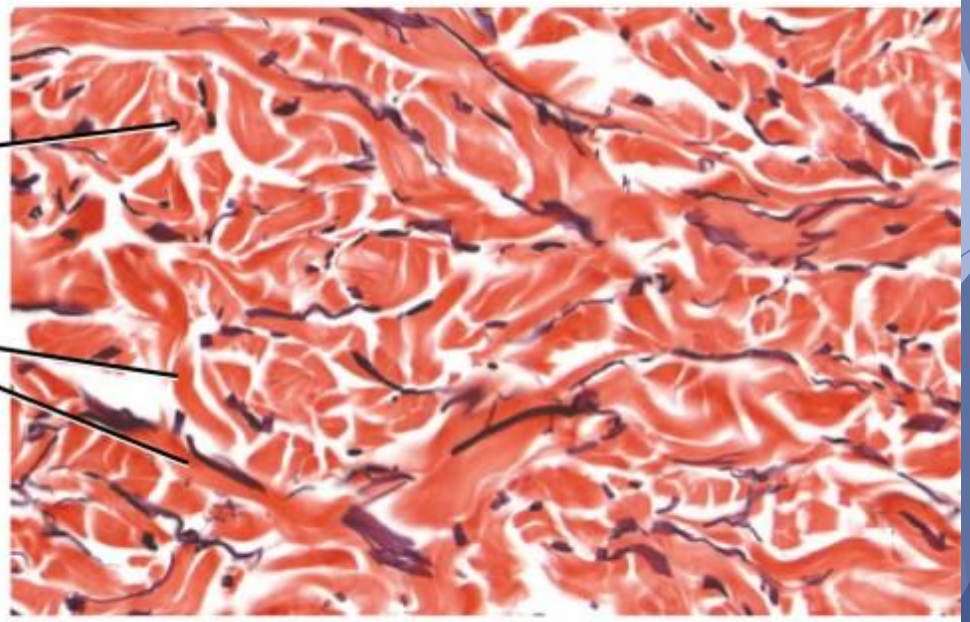


(a) Regular dense



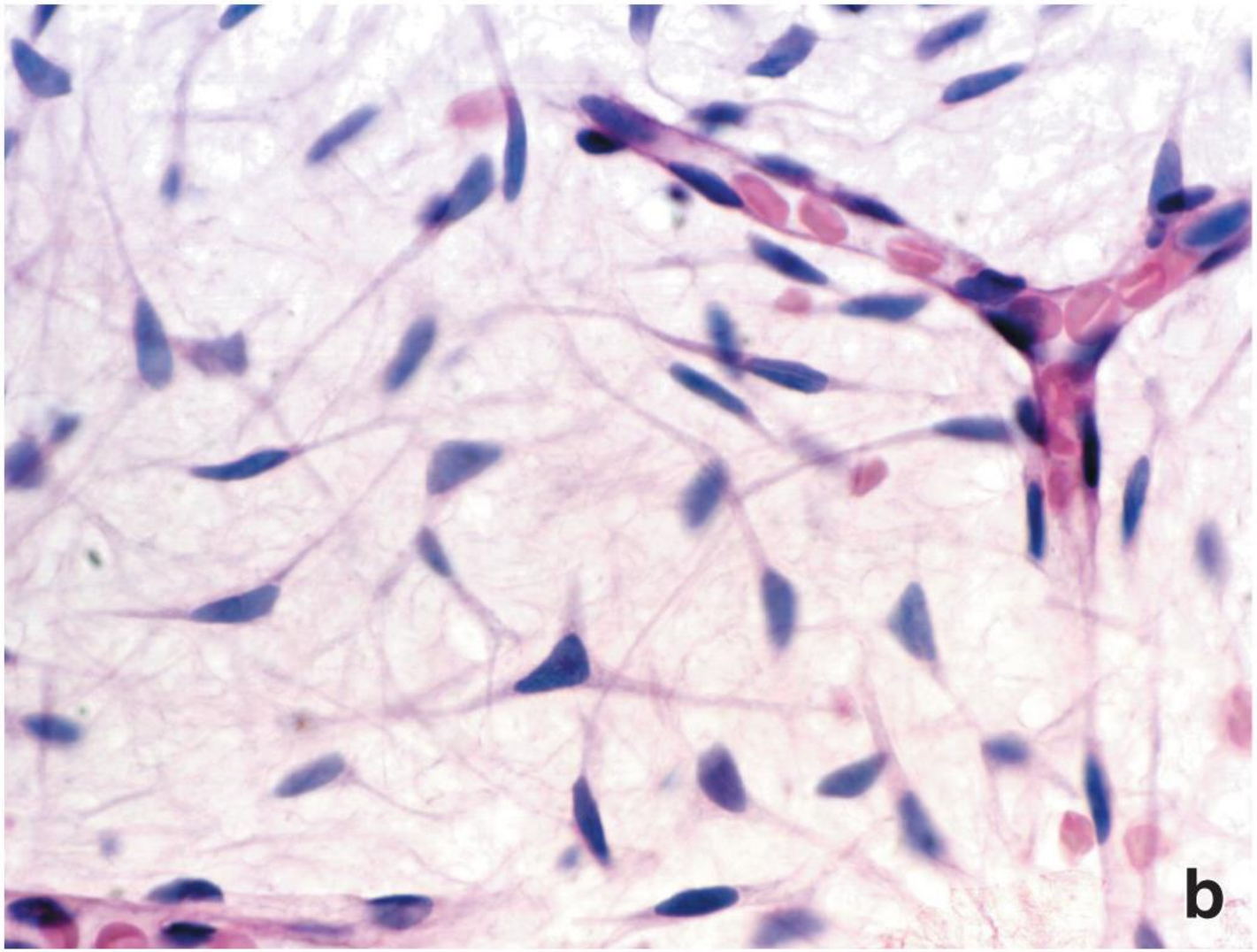
Fibroblast nuclei

Collagen fiber bundles

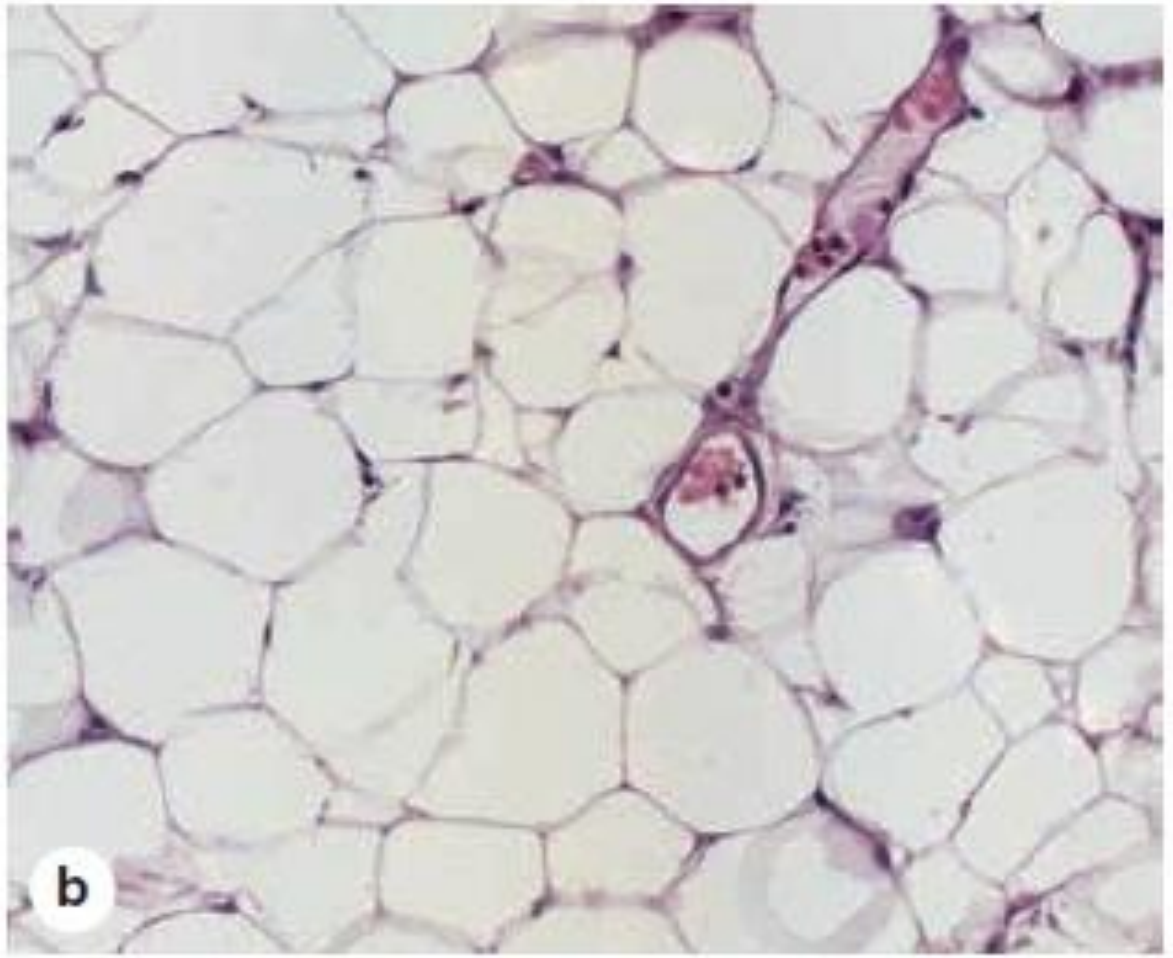


(b) Irregular dense

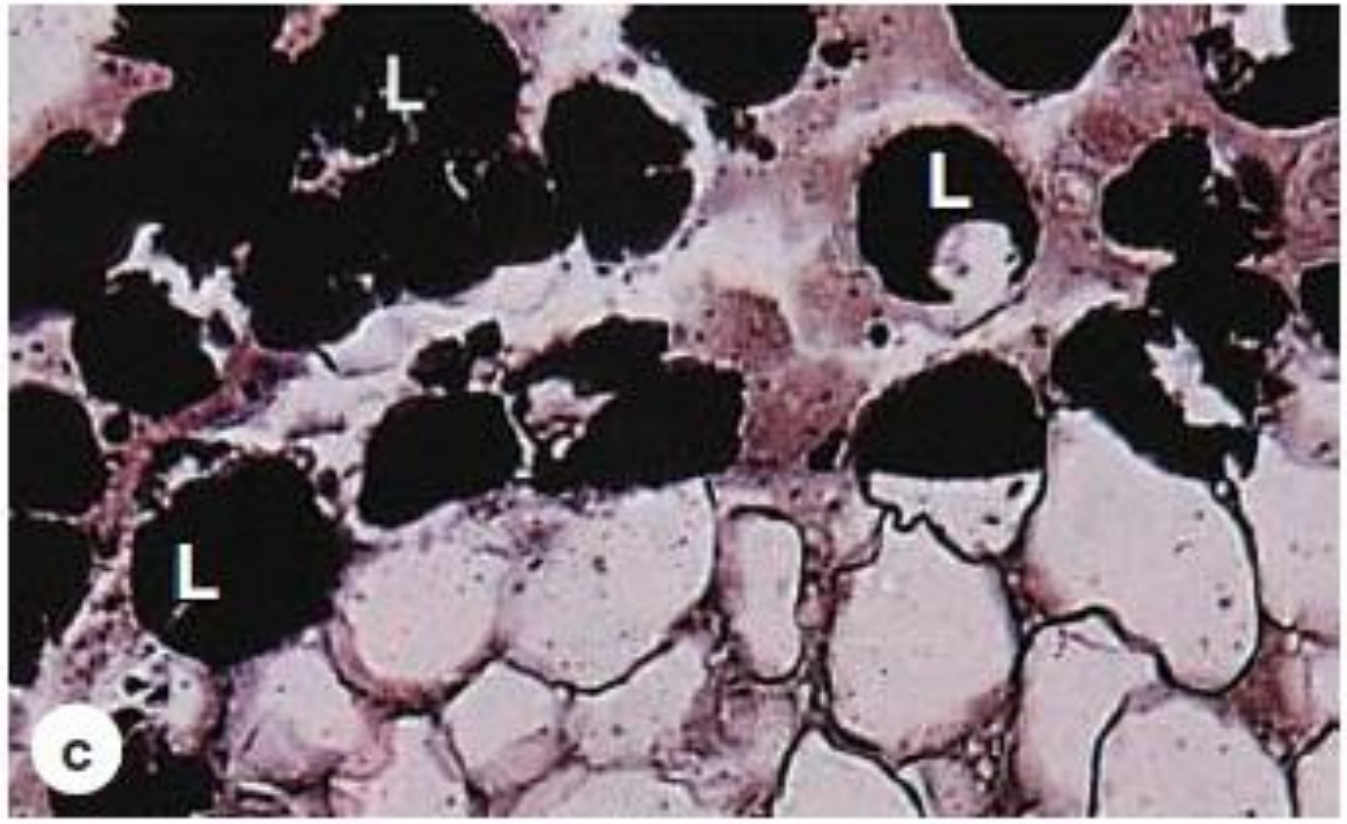
Mesenchymal Connective Tissue



- Large (empty) adipocytes predominate in this typical **white adipose tissue**, which shows only a small portion of microvasculature.



- Tissue was fixed here with osmium tetroxide, which preserves lipid (**L**) and stains it black.



White Adipose Tissue vs Brown Adipocytes Tissue