-Histology-

Epithelial tissue

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دعواتكم🫶🫶

* 4 types of tissues according to → type of cell → amount of ECM

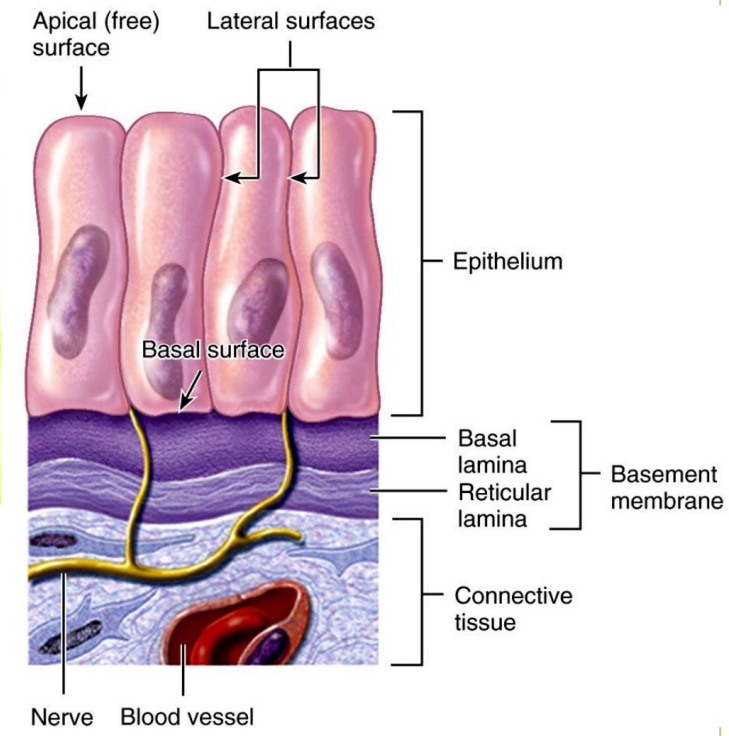
* Epi characteristics → ① cover → surface line → cavity
② contact with other medium.
③ rapid turn-over ex stomach → 5-7 days
epidemer → 4 week
④ sheets of closely packed cells.
⑤ polyhedral shape.
⑥ Polar
⑦ rest upon a sheet of ECM → Basal Lamina
⑧ under them → 1 layer of connective tissue.
ex GIT → lamina propria
SKIN → dermis.
⑨ avascular → diffusion.

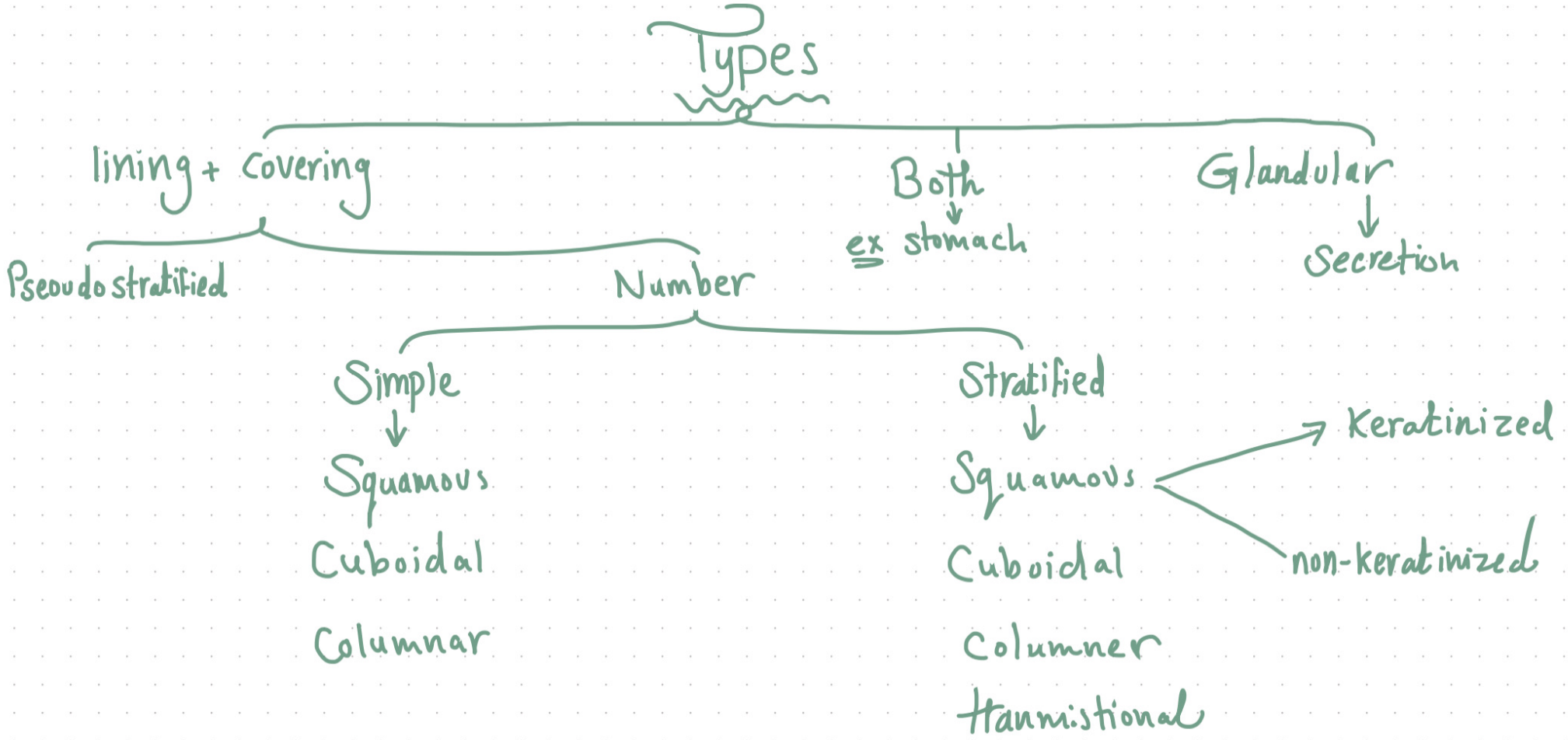
* Epi functions → ① lining, covering, protection.
② Secretion.
③ Absorption.
④ contraction. ex myoepithelial cells.

* Basal lamina : → sheet of ECM
→ under epithelium.
→ thin
→ E M.

* Function:
① support.
② Holes → Filtering
③ affect proliferation, differentiation, migration.
④ repair → nerve fiber, neuromuscular junction

* Basement lamina → thick
→ L M
→ = Basal lamin + reticular lamina fibers
↓
upper reticular rich
Fiber part
of connective tissue.




Types
lining + covering
Both
ex stomach
Glandular
Secretion
Pseudo stratified
Number
Simple
Squamous
Cuboidal
Columnar
Stratified
Squamous
Keratinized
non-keratinized
Cuboidal
Columner
tranmistional

	Examples	Function	nucleous shape	Cilia
Simple squamous	1) capillary → Endothelium. 2) lining alveoli → mesothelium. (wrong) 3) lining body cavities → pneumocytes.	→ thin cytoplasm → allow passing. → producing lubricating fluids.	Bulging and dark	x
Simple cuboidal	1) Renal tubules. 2) covers ovary ③ small ducts	① covering organs. ② involved of active transport	Round	x
Simple columner	1) ciliated → uterine tubes. 2) Non-ciliated → GIT, gallbladder	① Secretion → stomach ② Absorption → small intestine	OVAL	it could be ciliated or not.
stratified squamous keratinized	Skin → Epidermis.	① Protection ② Prevent water loss	Flat	x
stratified squamous non-keratinized	1) mouth, esophagus, anal canal. 2) vagina.	① Protection ② Secretion (water loss)	Flat	x
stratified cuboidal	large excretory ducts of salivary and sweat glands.	① Protection. ② Secretion.	Round	x
stratified columner	Conjuctiva	① Protection. ② Secretion.	Oval	✓
Transitional Urothelium	① Urinary bladder. ② ureters. ③ renal calyces.	① Protection → adverse effect of Urine. ② change size of bladder.	* Dome → empty bladder. * Flat → full bladder.	x
Pseudostratified Respiratory Epithelium	① trachea. ② bronchi. ③ nasal cavity.	① Protection. ② Secretion. ③ Cilia → remove particles from airway passage		✓

* كل ما زاد حجم duct بزيد حجم وعدد طبقات الـ epithelium.

Small duct ⟶ Simple cuboidal.
larger duct ⟶ " columnner.
larger duct ⟶ stratified cuboidal.
" duct ⟶ " columnner.

* ٣ صفات عجب نلاقيهن متوفرة في pseudostratified:
١) أنوية متراكمة.
٢) Cilia.
٣) goblet cell.

Glandular epithelium (secretion)

number of cells

- Uni → Goblet
- Multi → Salivary gland, sweat gland

Presence of ducts

- Exocrine → ducts → transfere to outside → Salivary
- Endocrine → x ducts → transfere by blood → Pancreatic Islets, Pituitary gland

morphology of

ducts

carry + transfere

- Branched → Compound
- un-branched → Simple

secretory portion

produce

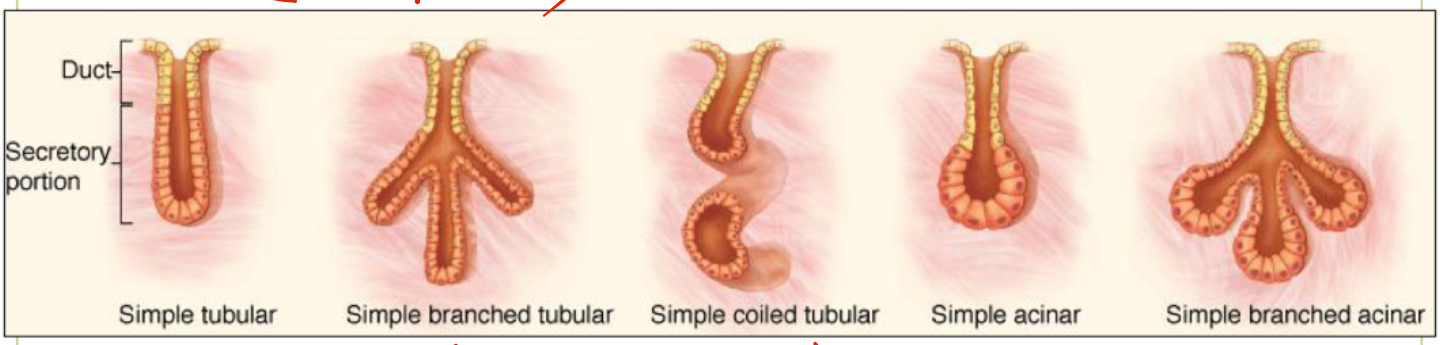
- Branches: Branched / Unbranched
- Shape
  - Tube → Tubular
  - Spiral → Coiled
  - Ball → acinar
  - Tubular + acinar → Tubular-acinar

method of secretion

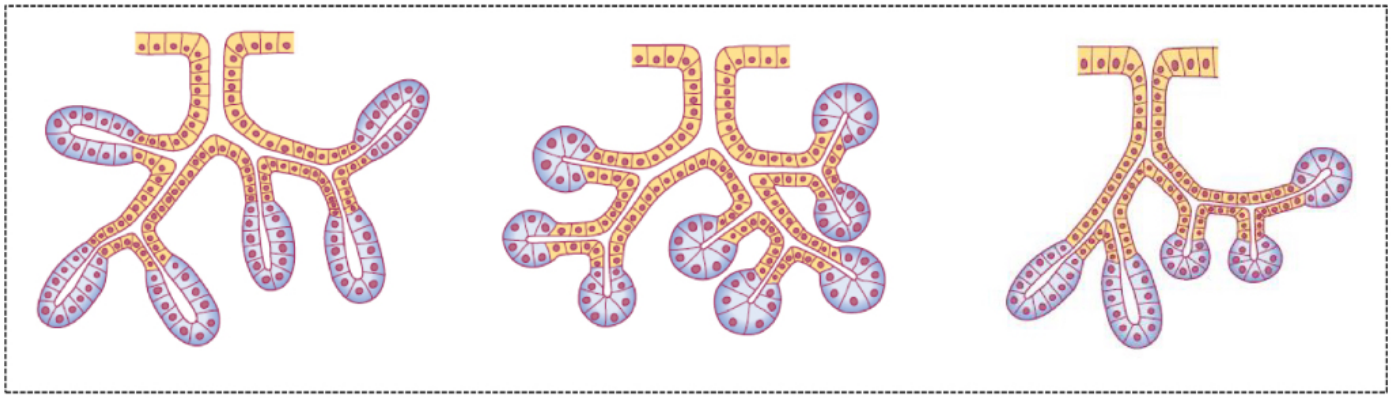
- merocrine → Salivary gland
  - Serous → Partoid
  - Mucous → Sublingual
- Apocrine → mammary gland
- Holocrine → sebaceous gland of skin

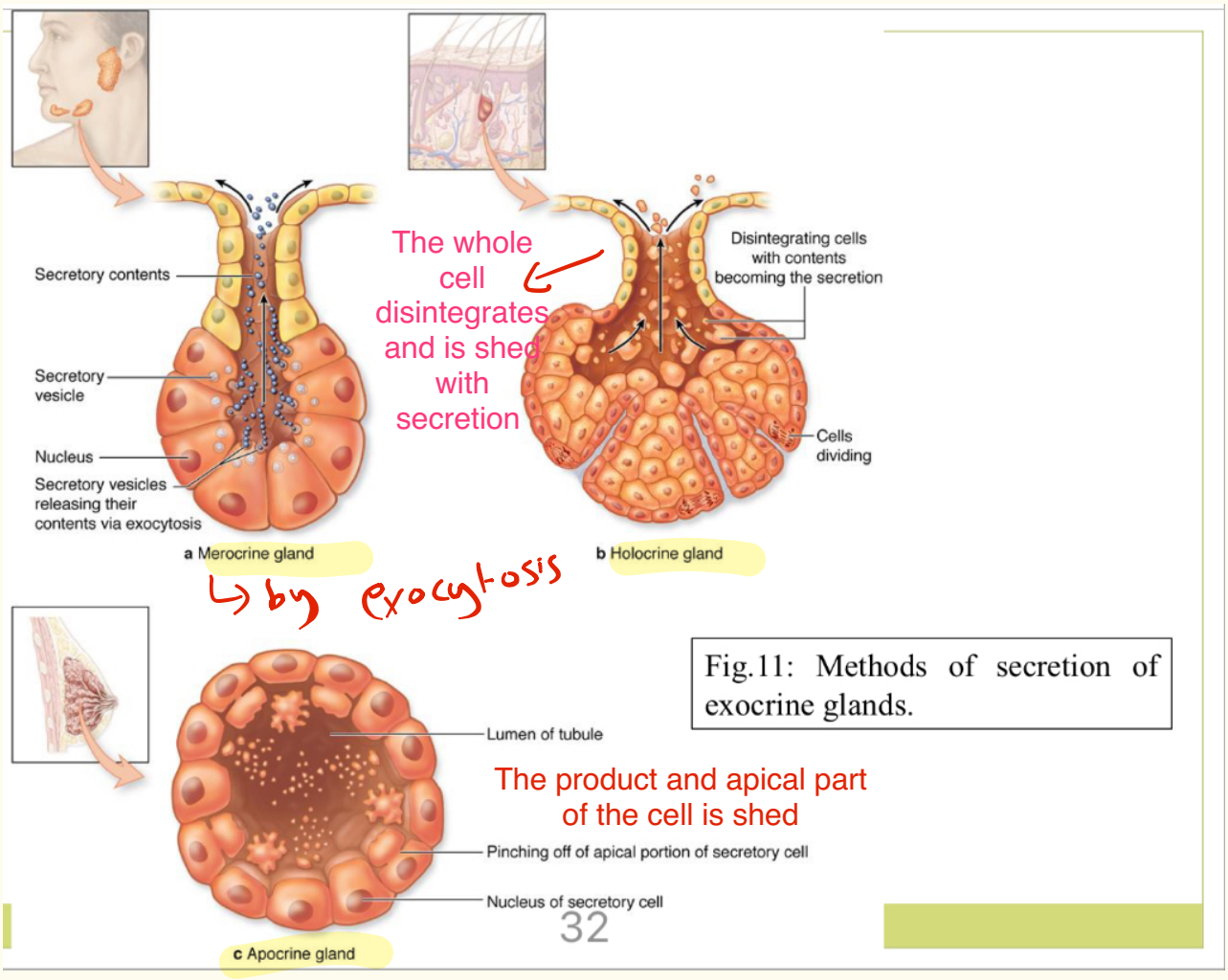
unbranch (simple)

Class of exocrine glands



Complex (branch)





↳ by exocytosis

Fig.11: Methods of secretion of exocrine glands.

	Serous	Mucous
Shape	pyramidal	pyramidal
nucleus	central + round	compressed in basal region
Because	-	large mucine-containing granules in apical region
Basal region	basophilic	basophilic
because	↑ RER + ribosomes	↑ RER
Appical region	acidophilic	-
because	secretory glands	-
Example	Partoid salivary gland	Goblet cells + Sublingual salivary gland
Others	-	content of granule dissapeare in preparation

* Goblet cell → unicellular + ~~Exocrine~~
  - → in digestive + respiratory glands
  - → between pseudo

* myoepithelial cells → between → secretory cells + basal lamina
  - → associated with glandular epithelium.
  - → contractile
  - → associated with glandular ← ↑

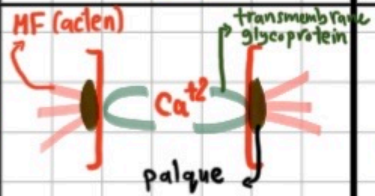
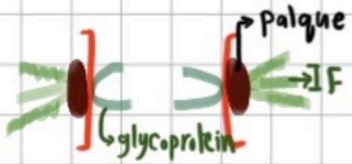
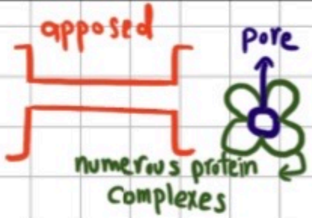
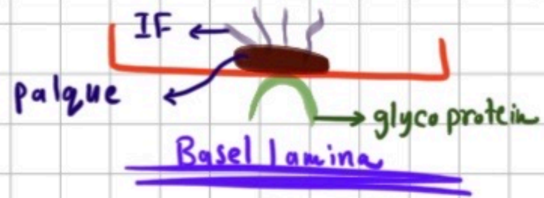
* polarity:
  - → various regions
  - → specialised structures
  - → different functions.

* 3 regions → apical → Facing lumen.
  - → lateral
  - → basal → on the basal Lamina

Cellular junctions → *epithelial cells*

Intercellular [lateral surface] — Tight, Adherent, Desmosome, Gap

basel surface — Hemidesomsis

Tight	Adherent	Desmosome	Gap	Hemidesomsis
Fusion+interaction between proteins of cell membrane.				
surround the cell	surround the cell	x	x	x
Ring	Ring	Scattered single spot (macula adherens)	–	–
Zonula occluden	Zonula adherens	x	x	x
• sealing منع التسرب • prevent the passage of substances • prevent the movement of proteins between apical + basal surface • blood-bile barrier	• adhesion between cells. • prevent seperation.	• strong cell-cell adhesion.	• Communicating • small molecules (H_2O, ions) pass. • Muscles: rappid passage of Ca^{+2} • bones: ensure the passage of nutrients.	• adhesion between the cell and underlying basal lamina.
apical lateral	below ZO, lateral	lower, lateral	anywhere, lateral	Basal Surface
Obstructive Jaundice	x	Pemphigus Vulgaris	Bullous Pemphigoid	x

ارجعوا افهموهم

* Tight junction consist of several strands of fusion.

* Hepatocytes → synthesis and secretion of bile → small intercellular channel

obstruction to the flow of bile → accomulate → ↑ pressure → rupture tight junctions → bile pass to sinusoid → jaundice

* Specialized of the basel surface:-

1) Hemidesosome anchoring → basal lamina

2) Striation + infolding → ↑ surface area

3) transporters + pumps

4) Receptors

Specialised of Apical surface

Finger like cytoplasmic projection

microvilli	stereocilia	Cilia
• absorptive.	• absorptive	• elongated.
• small intestine.	• epididymis + ductus deferens +	• motile
• actin filaments	hair cell of inner ear.	• trachea
• motile.	• longer than MV	• rythmic
• short, long.	• less motile.	• backward and forward.
• LM → brush border.	• branched.	• microtubules
• ↑ surface area	• ↑ surface area	

Formed of

Flagella: longer than cilia + rotational + in sperm

Primary Ciliary dyskinesia:
✓repeated infection ✓male / Female infertility.

Good luck :)

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