

Tissues of adult organism

□ A tissue is defined as a group of cells with their extracellular products, specialized in common direction and set apart for the performance of a common function.

المنفصلة

□ Cells work together in functionally related groups called **tissues**

How is this done?

❖ Attachments

cell junction

❖ communication

□ About 200 types of specialized cells in adult human body are arranged into **4 main tissues:**

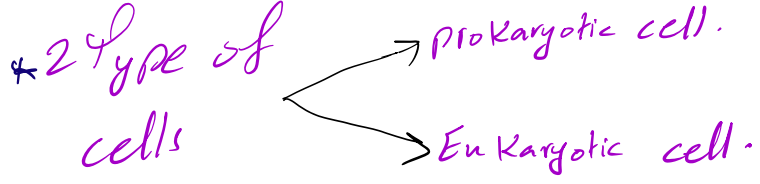
➤ Epithelium

مستترکینہ محاسبات
Basic structure..

➤ connective tissues

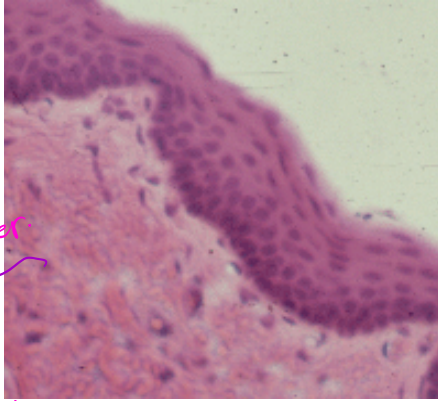
➤ Muscular tissues

➤ Nervous tissues



* نکاحانہ و لایا قریبہ
لبعض العصب ← نکاحانہ
Extracellular ← مکیه
matrix (fluid)

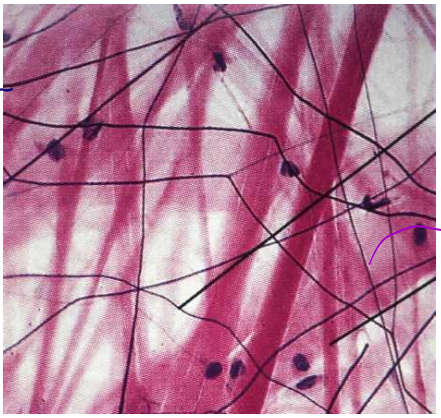
4 Basic Types of Tissues



(closely attach to each other)
نوى متراصة
مترابطة جوارها

Epithelial tissue

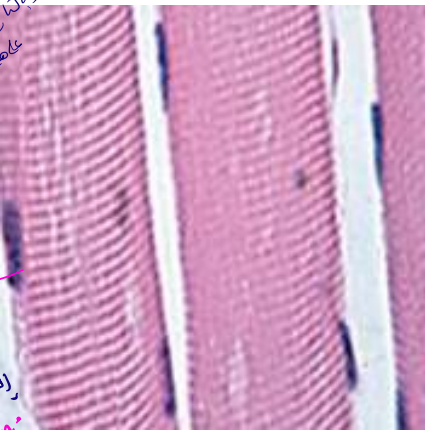
تغطية + حماية
covering: تغطية + حماية
lining: تغطية + حماية
General function
protection



* Covering \Rightarrow skin تغطية
* Lining \Rightarrow hollow structure
دائم
(nuclei widely separated.)
نوى متباعدة

Connective tissue

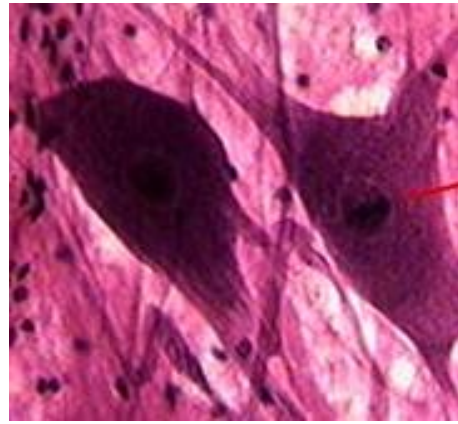
Extra cellular matrix
مادة خارج الخلية
سبب الخرفات



* خلايا متراصة
جدا عن بعضها
الذي يتكون
من الخلايا
intercellular
matrix
المادة بين
الخلايا
Epithelial tissue
منسجمة

Muscular tissue

General function
movement



Nervous tissue

مترابطة جوارها
muscle cell
muscle fiber
* main function
contraction

Epithelial Tissue

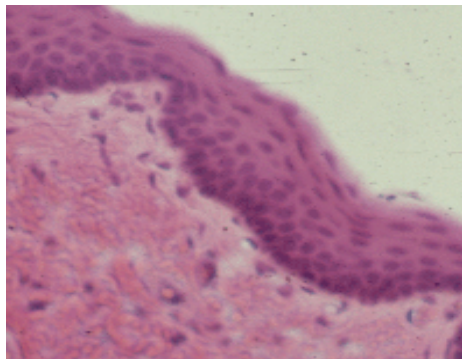
highly cellular. → component موجود (الخلايا) ←

□ Epithelium creates a selective barrier between the external environment and the underlying connective tissue

□ The cells predominate, they are closely apposed and adhere to one another by means of special junctions

□ Their basal surface is attached to an underlying basement

membrane



resting on Basement Membrane. ← الخلية *
 Embryo في بداية تكوينه يكون عبارة عن (ovum + sperm) ←
 بعد هذا fertilization ← الخلية *
 Zygotes (نويضة مخصبة) ← الخلية *
 بعد ما يصير الـ rapidly dividing ← خلايا كثيرة
 هذه الخلايا تنقسم 3 embryonic layers ← هذه layers تنقسم
 منها الـ embryonic layers
 * Ectoderm
 * Endoderm
 * Mesoderm
 Epithelium ← الخلية *
 3 embryonic layers ← الخلية *

General morphological signs of epithelial tissues

covering epithelium ← cover بصر
انسان ← إزالة

glandular epithelium ← secretion بصر
انسان ←

Epithelial tissues are widespread throughout the body. They form the covering of all body surfaces, line body cavities and hollow organs, and are the major tissue in glands.

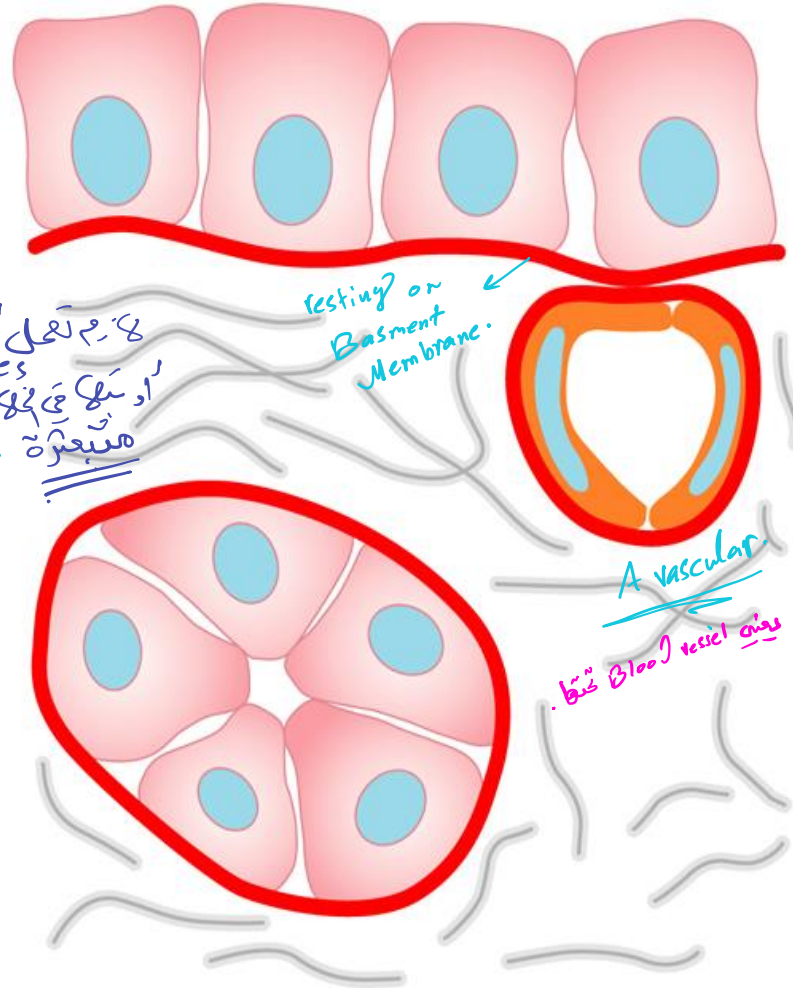
- 1) Cells are closely packed together. → cells numerous in number
- 2) Intercellular substance is reduced to a minimum.
- 3) Cells rest on the basal lamina.
- 4) Polarity of epitheliocytes (in the epitheliocytes there are apical and basal poles).
apical قمي
- 5) All epithelia don't have blood vessels. They derive their nutrition from the blood vessels of underlying connective tissue.
highly nerve innervated ← (diffusion) ← highly innervated
↳ Avascular ← tissue ← blood vessel of
↳ highly innervated ← highly innervated
- 6) Availability of intercellular junctions.
- 7) High ability to regeneration. → rapidly regeneration.
بصر ← skin في injury لوصول
باله
- 8) Derived from three embryonic layers

Characteristics ٤

General features of epithelium

- Derived from 3 embryonic layers ↑ دكتيم فوقه
- Closely aggregated cells
- Very little intercellular substances البيج
- Regular shaped cells bind together by junctional complexes لا يتم تعلق
الخلايا ببعضها
بواسطة
مادة
مسيجة
- Basal lamina (**basement membrane**)
- Avascular نقص
في → Blood vessels
دكتيم فوقه
- Rich in nerve supply غني
بالتددية
- High renewal rate

injury ← لوحته العا



Classification of epithelium

Covering and lining epithelium

Special types

Glandular (secretory) epithelium

هذه النوعي لا يغطي ولا يفرز
ولا يفرز
التي وظائف
أخرى

- Epithelium covers body surfaces, lines body cavities, and constistutes glands, therefore it is subdivided into lining, glandular and special types

3

①
②

Classification of covering = lining epithelium



Number of layers

□ Simple



One layer of cells

□ Stratified

More than one layer

no seen ← cell membrane ← too thin by light microscope.

Shape of cells

➤ Squamous → flat

➤ Cuboidal → cubical in shape
central rounded nucleus

➤ Columnar → oval basal nucleus

➤ Pseudostratified

More than one layer.

too thin

Covering.

Classification of lining epithelia

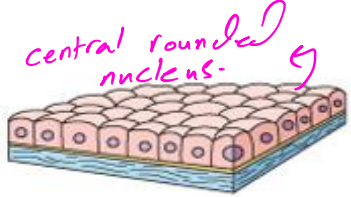
Simple

→ one layer ← *بمیزن* ← *نویز* ← *nucleus*



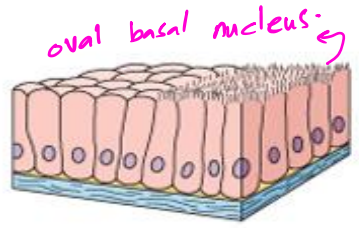
Squamous

flat nucleus.



Cuboidal

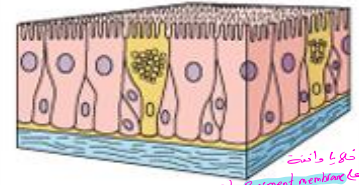
central rounded nucleus.



Columnar

oval basal nucleus.

Pseudostratified

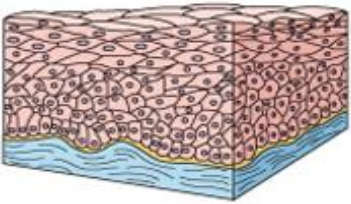


Pseudostratified columnar

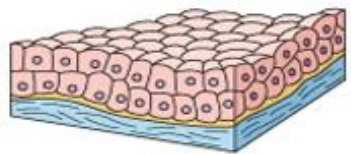
نویز
Basement membrane
columnar
oval nucleus

Stratified

→ *layer* → *اکثرف* → *superficial layer* ← *بمیز*

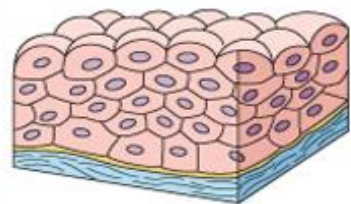


Squamous nonkeratinized

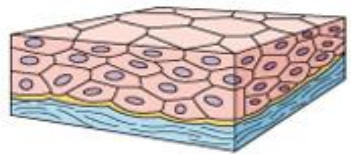


Cuboidal

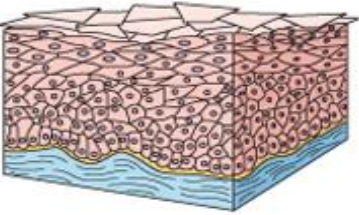
Transitional



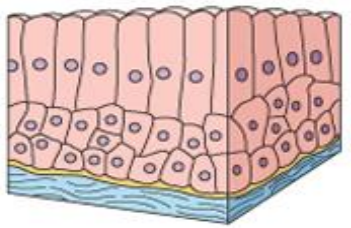
Transitional (relaxed)



Transitional (distended)



Keratinized

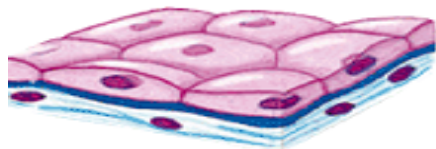
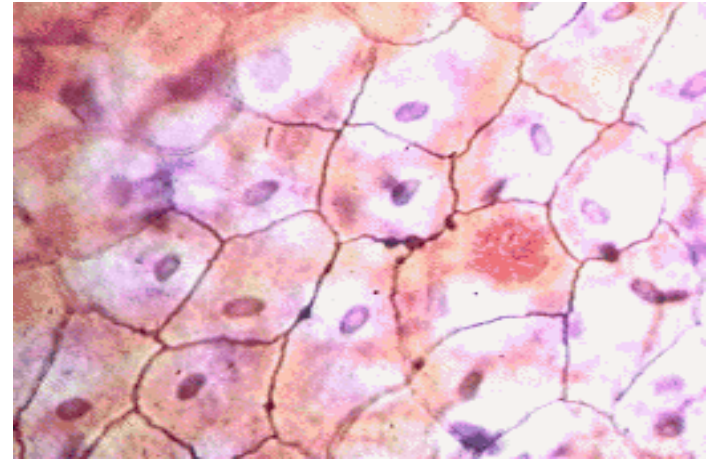
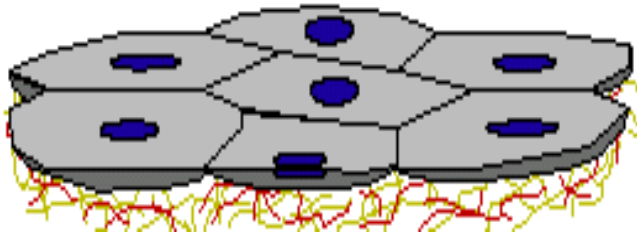


Columnar

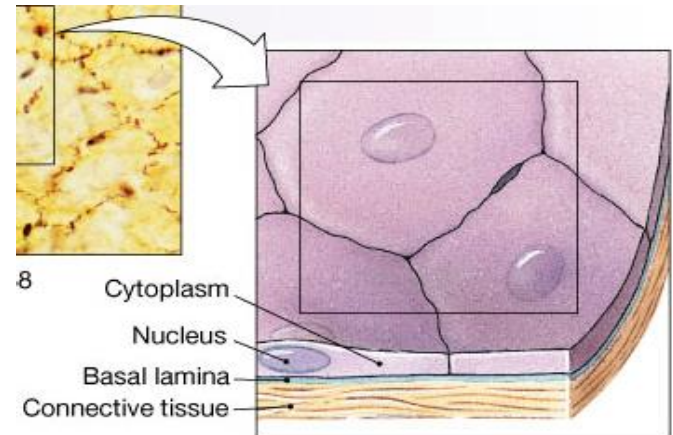
1- Simple Squamous Epithelium

smooth surface all, + very thin ←

LM:



Simple squamous



1- Simple Squamous Epithelium

دین لقاہ
بسو و ضیفہ

2

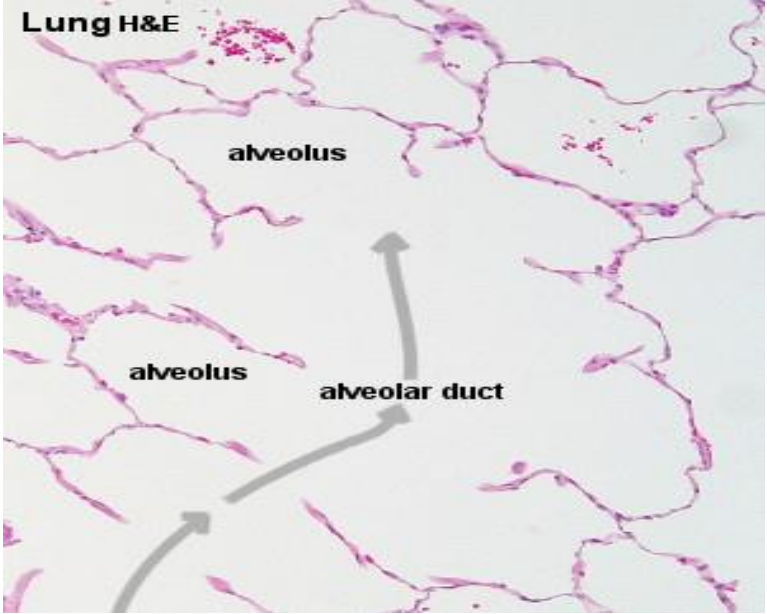
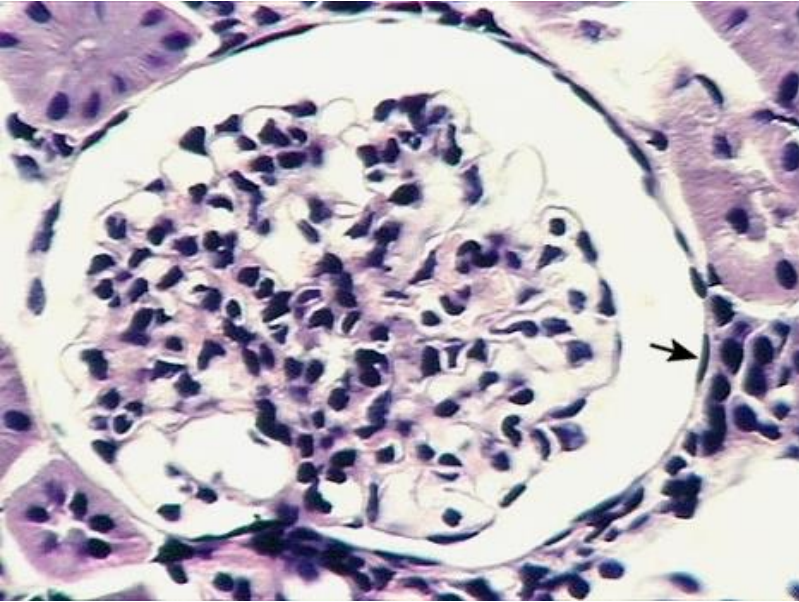
1



(Bowman's capsule- kidney)

(Lung alveoli)

glomerulus



Function: Filtration of blood

Function: gas exchange

air دین لقاہ
lungs- Blood vessels دین لقاہ
Blood

Simple Squamous Epithelium

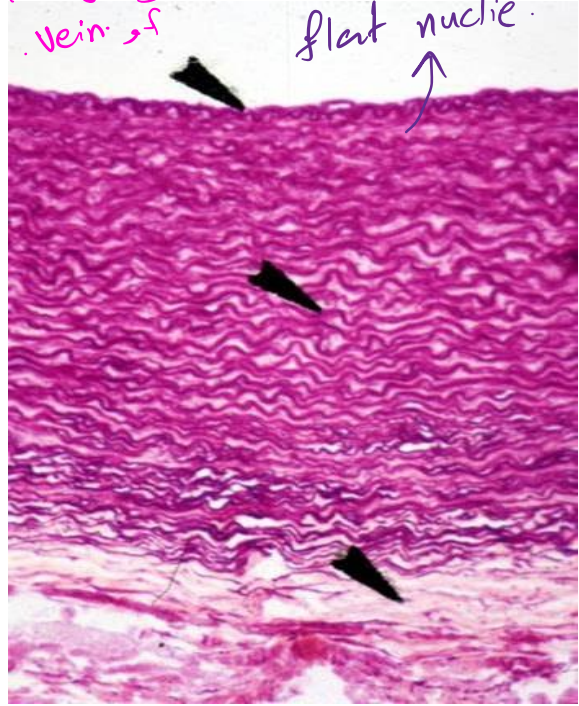
lining lumen of blood vessels.
↑
equal

Endothelium:

of the blood vessels

artery
vein

flat nuclei

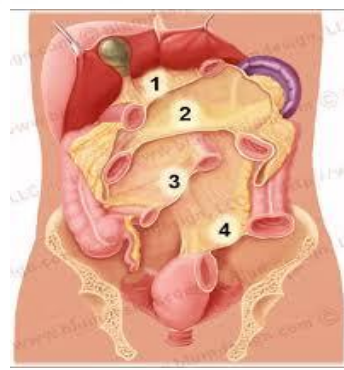
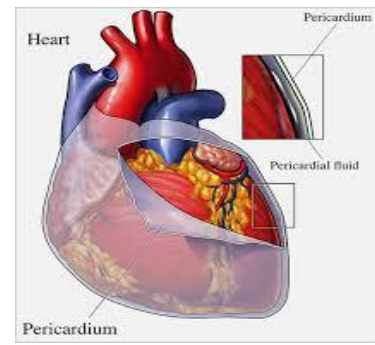
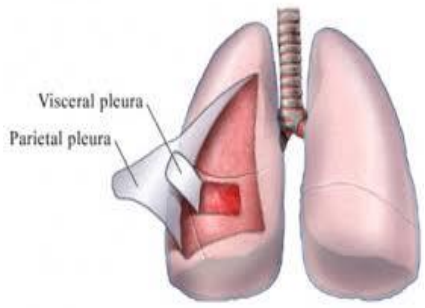


Mesothelium:

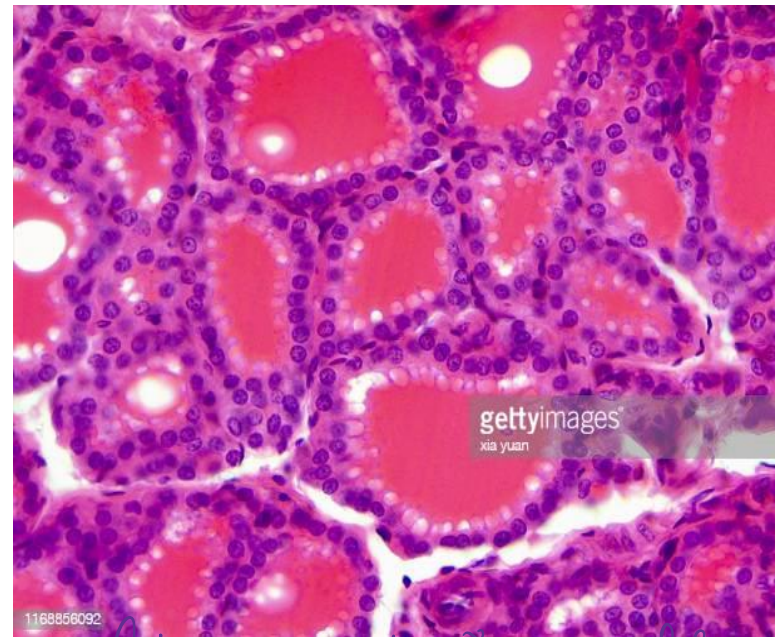
Heart
Lung
intestine

Pericardium, pleura, peritoneum

Function: smooth surface



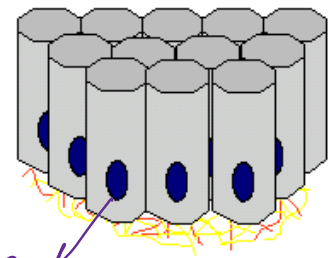
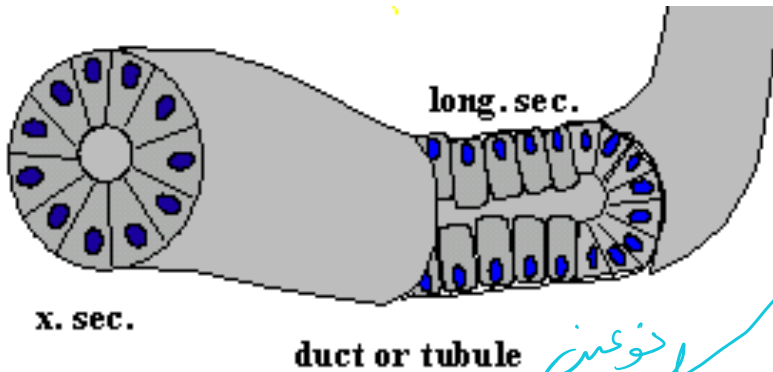
2- Simple cuboidal Epithelium



Thyroid hormone secretion ← جوارها follicle جوارها
covering glandular → الوظيفة
Site: Thyroid gland : secretion
kidney tubules : ion exchange
الوظيفة

central rounded nucleus.

3- Simple Columnar Epithelium



oval in shape.

Types:

a. Non ciliated

Most common site *ملاحظة* *
 cilia *التي تحتوي على*

b. Ciliated

respiratory system ← هو

طليان dust partick *ملان رين* *دست جزيئات*
 washing *غسل* ← *من طريقه cilia* *عن طريق* *epithilia*

* Microvilli

↳ projection → *طالعة* *من* *surface*

non motile *لكن* *سيزد* *surface area* *من* *سفره*

* cilia → *طالعة* *من* *apical* *part* *of* *cell*.

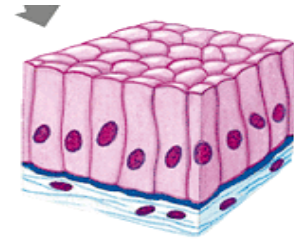
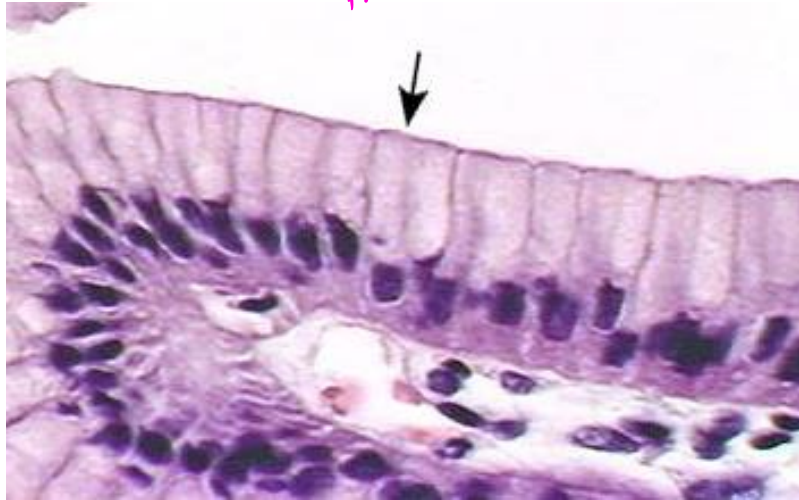
motile *لكن* *سيزد* *surface area* → *نظيفتها*

Movement of luminal content.
 * *من* *منطقة* *تتوقف* *عليها* *بغير* *تحتها* .

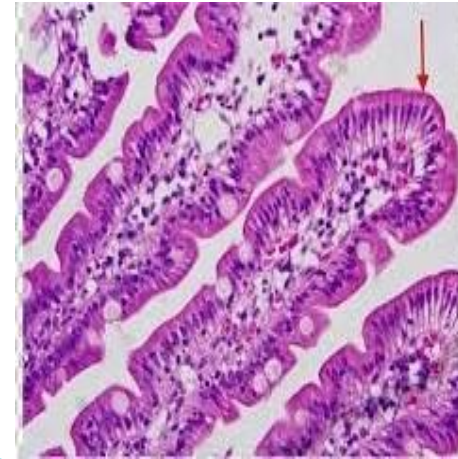
Simple columnar epithelium (non ciliated)

LM

gastrointestinal tract. ← موجود في



Simple columnar



Sites: ducts of glands: secretion
digestive tract: absorption

(gastrointestinal tract).

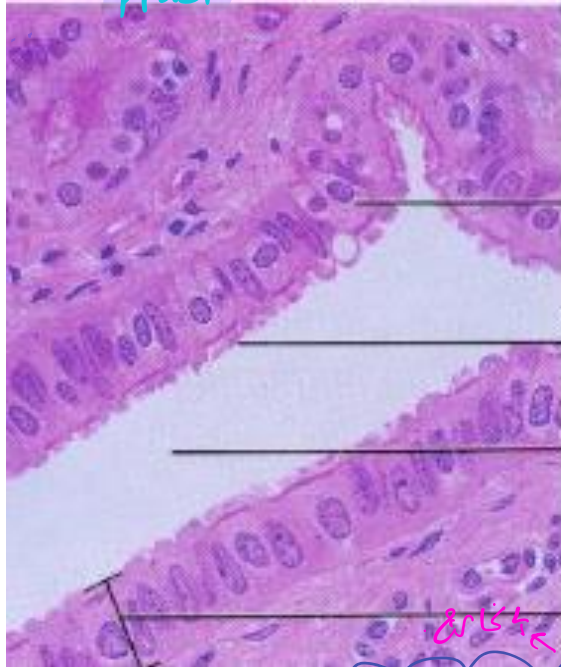
← Apical Microvilli) ←

Surface area for absorption (مقدار جبهة لتزيد)

Simple columnar epithelium ciliated

respiratory tract

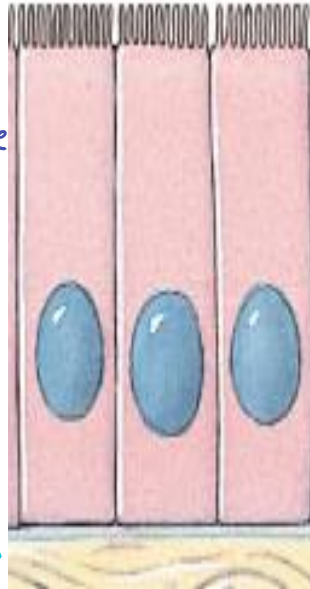
ملاحظات ← أكثر مكانه فيه ← ciliated epithelium هو ←



nucleus
cilia
lumen

Ciliated simple columnar cells

♀ اسهال، لثا في
fallopian tube
♀ ovary موجوده في pelvis
يطلع o.vum
لما دخلت لبريتة من ovary
على fallopian tube
في توفه في peritoneum
تبع abdominal cavity
لذلك ما تاحس
بها في نهاية ل fallopian tube



طبايعه بيوانع >> في حنوط الرحم
وتأخذ ova اول ما تطلع قبل ما تدخل
بي تدخل fallopian tube
فertilization
peritoneum
uterus (مساكنه)
في توفه في peritoneum
تبع abdominal cavity
لذلك ما تاحس
بها في نهاية ل fallopian tube

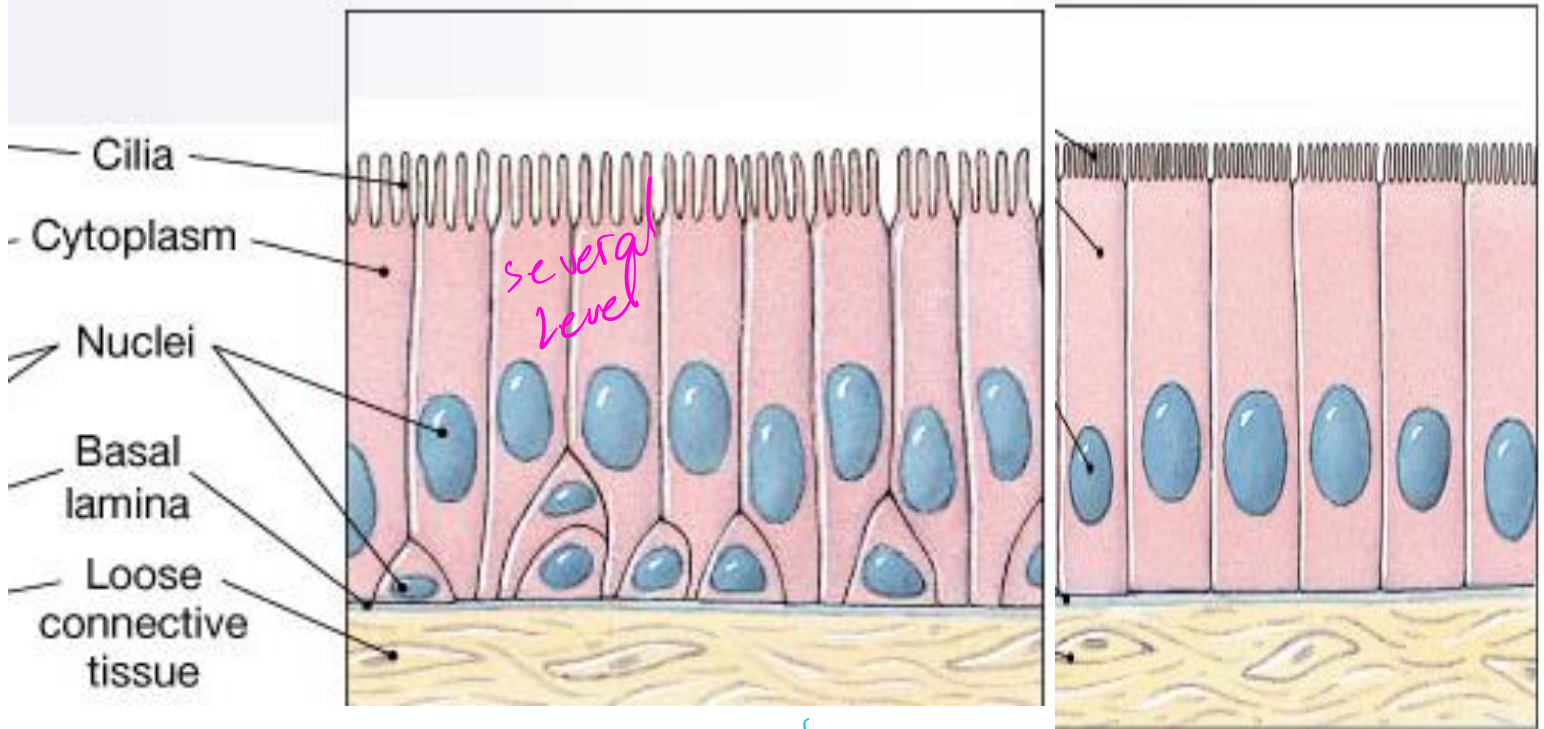
Sites: uterus, oviduct & bronchiole of the lung

(movement of luminal contents)

♀ nose (nasal cavity) / naso pharynx / Larynx / trachea / 2 main bronchi.
pseudostratified ciliated columnar epithelium. كل عدل فيه

4- Pseudostratified columnar epithelium ciliated -

False respiratory system *و* mainly/only موجود



Pseudostratified columnar epithelium non ciliated

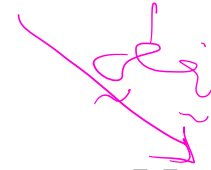
* مكافئة ←

Microvilli
↳ short + non motile

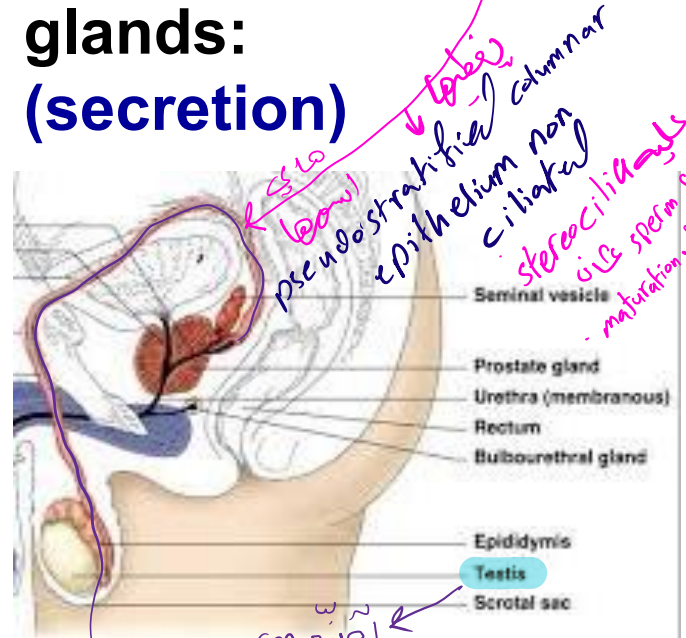
long + motile ← Cilia لكن *
long + non motile ← stereocilia *
ما فيه هان لوي فا
هان لوي فا هان كي



* مكافئه stereocilia ← تبغري كبريه



- **Sites:** Male genital tract – large ducts of glands: (secretion)



ماتر (sperm) ليغز maturating
stereocilia
non ciliated

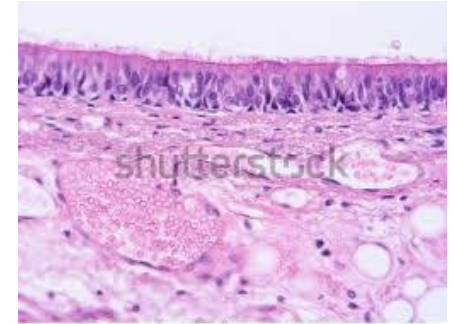
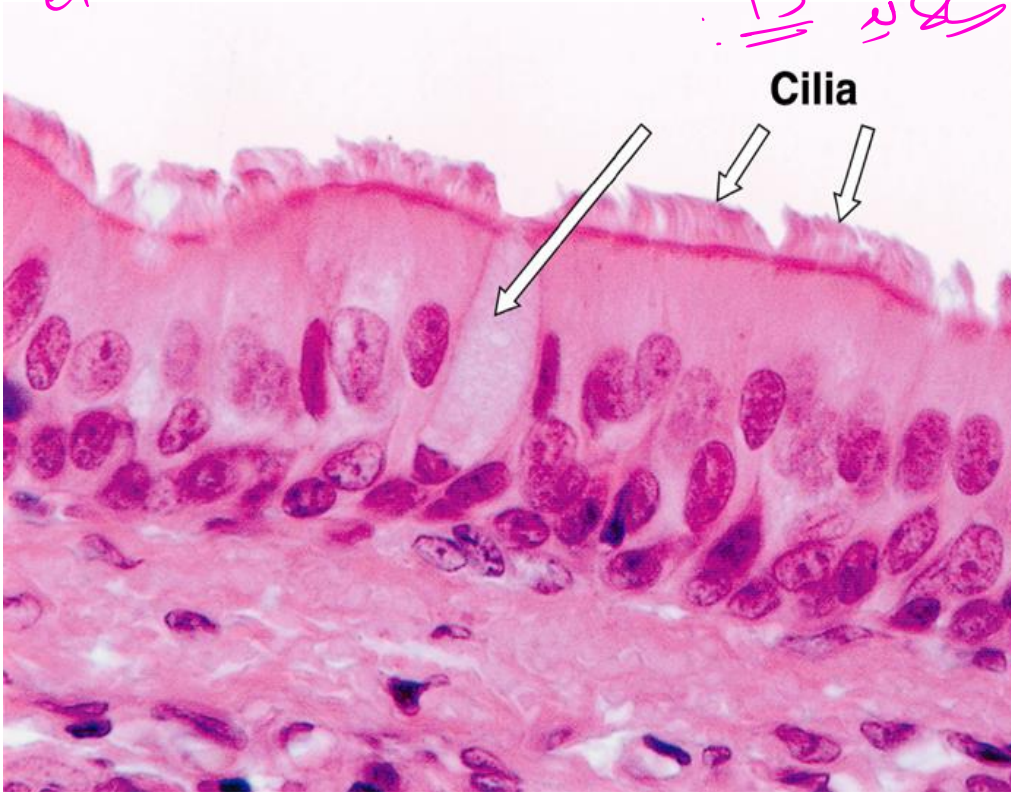
لصنع sperm واطلع

Pseudostratified columnar epithelium ciliated

respiratory epithelium
نخاعية
←

Sites: Nose- Trachea

تلكهت كسما في لايه 15



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Epithelium

* رصيفه
washing/cleaning
بيجره cilia

Type	Site	Function
Simple Squamous	<ul style="list-style-type: none"> • Bowman's capsule- kidney • Lung alveoli 	Filteration
Simple cuboidal	<ul style="list-style-type: none"> ❖ Thyroid follicles ❖ Kidney tubules 	<ul style="list-style-type: none"> ❖ Secretion ❖ Ions exchange
Simple Columnar non ciliated	<ul style="list-style-type: none"> ➤ Digestive tube ➤ Ducts of the glands 	<ul style="list-style-type: none"> ➤ Absorption ➤ Secretion
Simple Columnar ciliated	<ul style="list-style-type: none"> ▪ uterus, oviduct ▪ bronchiole of the lung 	<ul style="list-style-type: none"> ▪ Movement of luminal contents
Pseudostratified columnar ciliated	<ul style="list-style-type: none"> ✓ Nose- Trachea 	Movement of luminal contents
Pseudostratified columnar non ciliated	<ul style="list-style-type: none"> ☐ Male genital tract ☐ large ducts of glands 	Secretion