

DOKULAR

A-Hücreler

B-Hücrelerarası madde (intersellüler substans)

veya

-Temel madde (Fundamental substans)

Hücre farklılaşması sonucu 4 temel doku:

1.EPİTEL 2. DESTEK 3. KAS 4. SİNİR DOKU

Destek dokular:

a. Bağdokusu b. Kıkırdak c. Kemik d. Kan Doku

EPİTEL DOKU

EPİTEL DOKUNUN FONKSİYONLARI

- **Koruma :**

Epitel dokusu altındaki dokuları mekanik yaralanmalardan, zararlı kimyasallardan, invaziv bakterilerden ve aşırı su kaybından korur.

- **Duyuları alma:**

Senzorik sinir sonlanmaları içeren özelleşmiş epitel doku deri, göz, kulak, burun ve dilde bulunur.

- **Salgı yapma:**

Epitel doku, enzimler, hormonlar ve nemlendirme sıvıları gibi özel kimyasal maddeler salgılamak üzere özelleşmiştir.

- **Absorpsiyon:**

İnce bağırsakları örten epitel hücreleri alınan yiyeceklerden besin maddelerini emilimini üstlenir.

EPİTEL DOKUNUN FONKSİYONLARI

Böbreklerdeki epitel doku artık ürünlerin atılmasını ve gerekli olan maddelerin ise idrardan geri emilimini sağlar. Ter, ter bezlerindeki epitel hücreleri tarafından vücuttan atılır.

- ***Diffuzyon***

Tek katlı epitel gazlar, sıvılar ve besinlerin geçişmesini sağlar (akciğer alveolleri ve kapilar kan damarlarının duvarları gibi).

- ***Temizleme***

Kinosilyumlu epitel toz partiküllerinin ve yabancı cisimlerin hava yollarına girişini engeller.

Görevleri gözönünde bulundurulduğunda
epitel dokular 4 gruba ayrılır

1- ÖRTÜ EPİTELİ

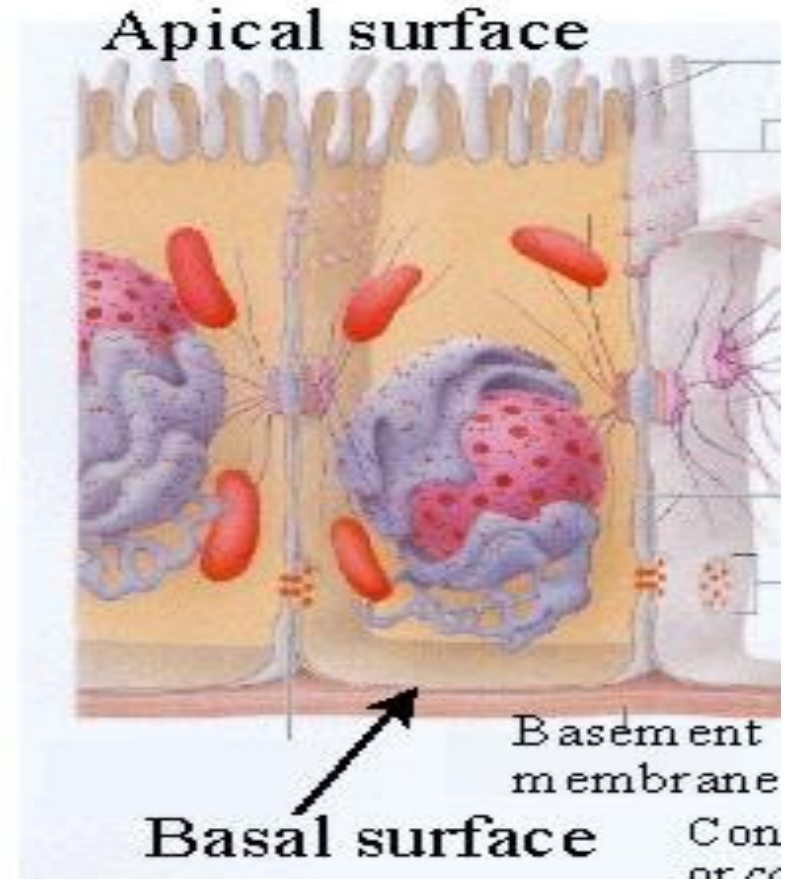
2-SALGI EPİTELİ

3-KASSEL EPİTEL

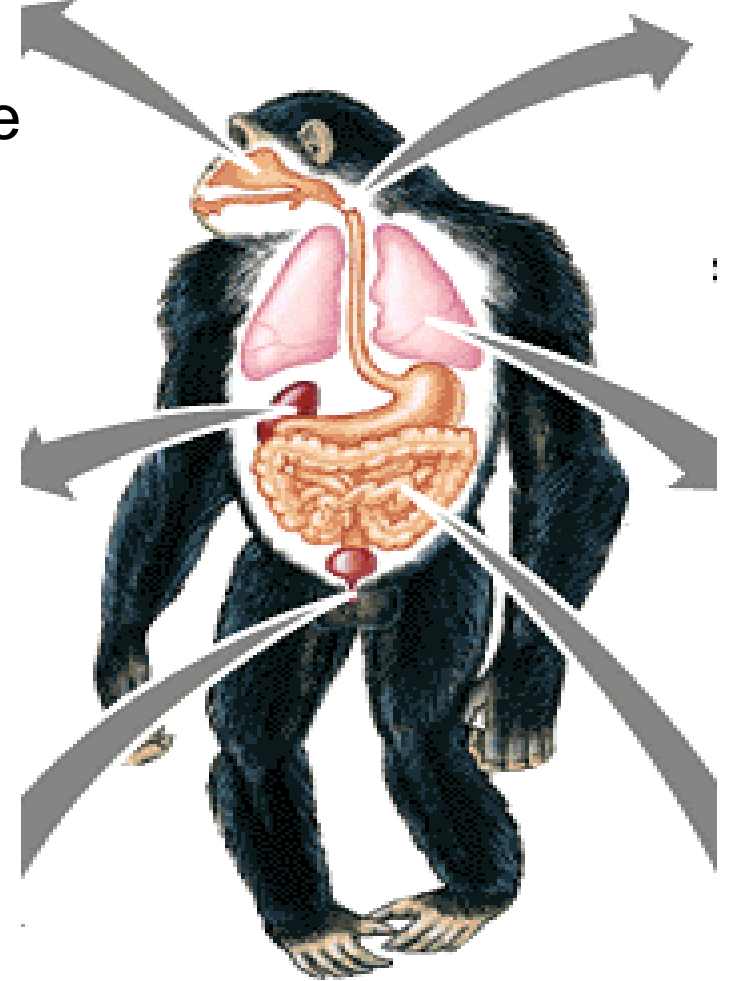
4-DUYU EPİTELİ

1-ÖRTÜ EPİTELİ

- Koruyucu epitel
- Apikal yüz
- Bazal yüz
- Lateral yüz



- Epidermis hücreleri (vucudun dış yüzü)
- Mukoza epiteli : dış ortama açılan (so sin-urogenital) sist iç yüzü
- Mezotel hücreleri: Vücut boşlukları ve bu boşluklardaki organların dış yüzü.
- Endotel hücreleri: Dolaşım sist ve damarlar



Örtü epitelinin sınıflandırılması

1-Katlılık durumuna göre:

a-Tek katlı örtü epiteli

b-Yalancı çok katlı örtü epiteli

c- Çok katlı örtü epiteli

2-Şekillerine göre:

A-Yassı

B-Kübik

C-Prizmatik

D-Piramidal

E-Değişken

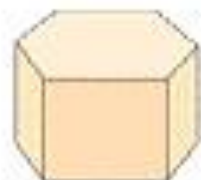
İki özellik birlikte ele alındığında;

- 1-Tek katlı yassı örtü epiteli
- 2-Tek katlı kübik örtü epiteli
- 3-Tek katlı prizmatik örtü epiteli
- 4-Tek katlı piramidal örtü epiteli
- 5-Yalancı çok katlı prizmatik örtü epiteli
- 6-Çok katlı yassı örtü epiteli
- 7-Çok katlı prizmatik örtü epiteli
- 8-Çok katlı değişken örtü epiteli

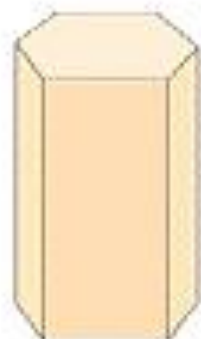
Epithelial Shapes



Squamous



Cuboidal

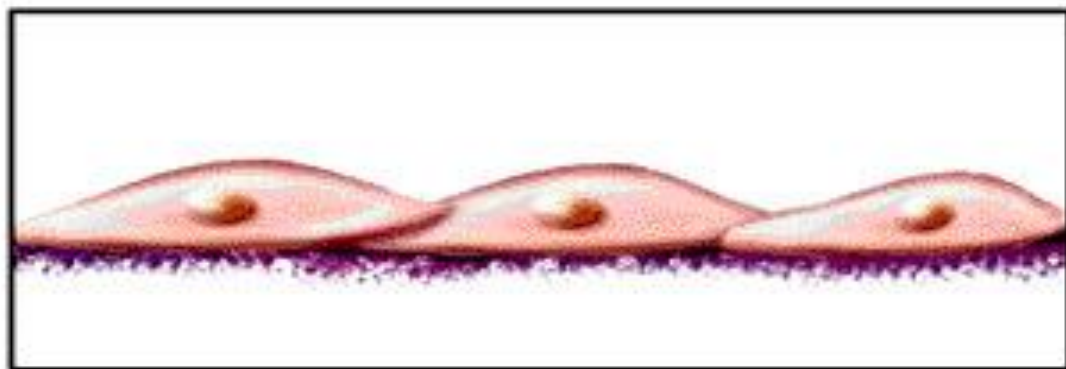


Columnar

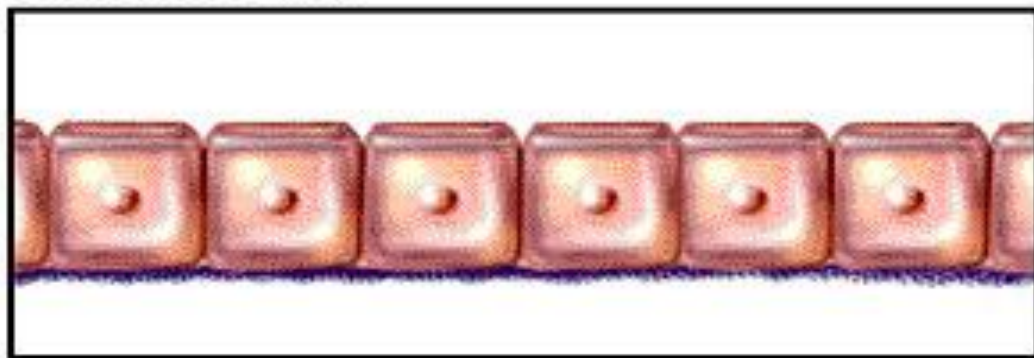


(b)

Squamous



Cuboidal



Columnar



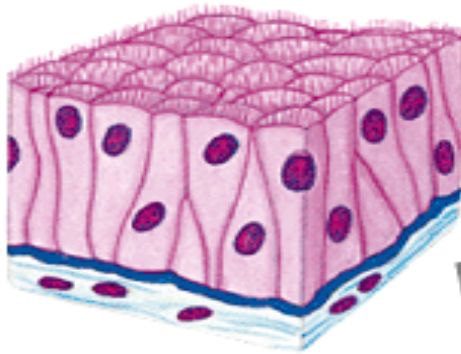
Simple epithelium



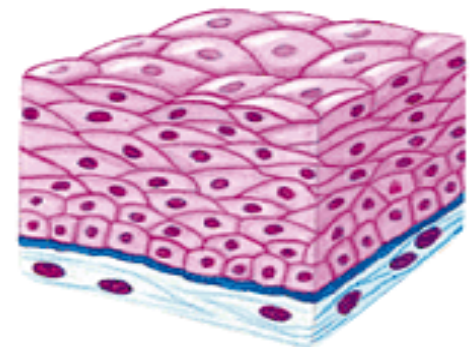
— Basement membrane

Stratified epithelium

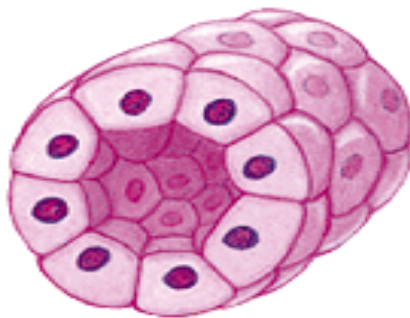




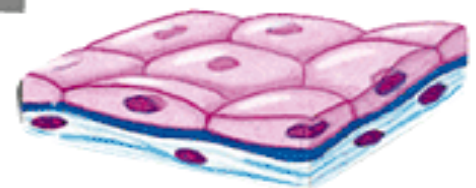
Pseudostratified ciliated columnar



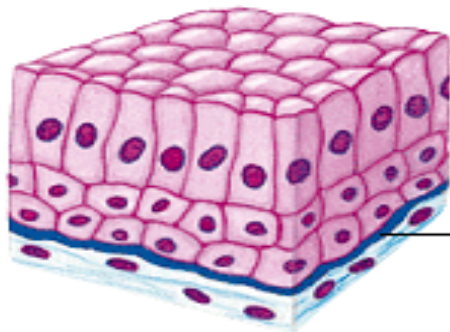
Stratified squamous



Simple cuboidal

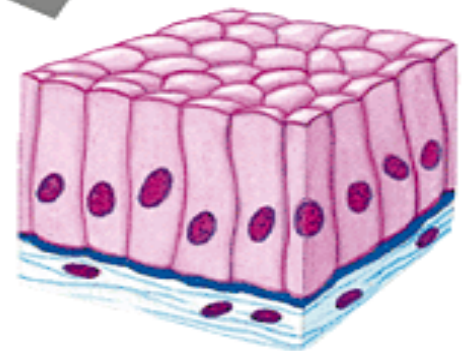


Simple squamous

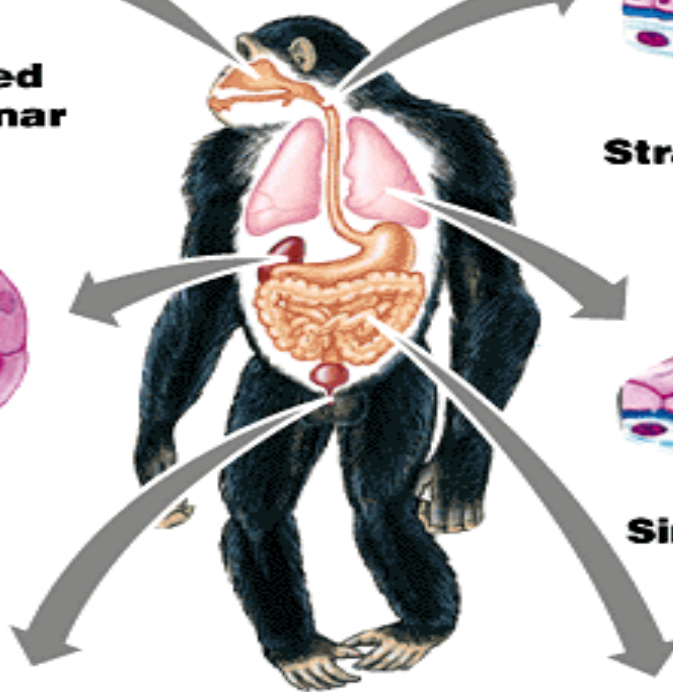


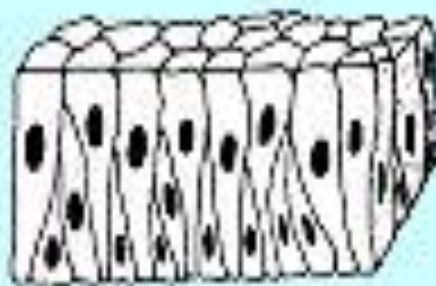
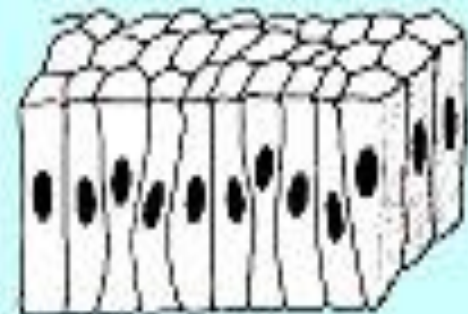
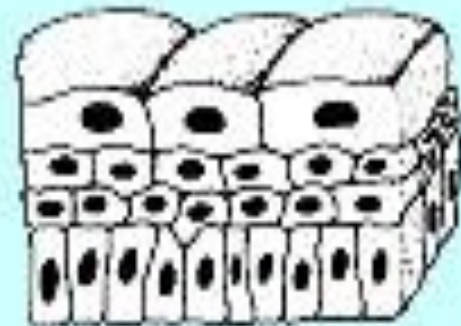
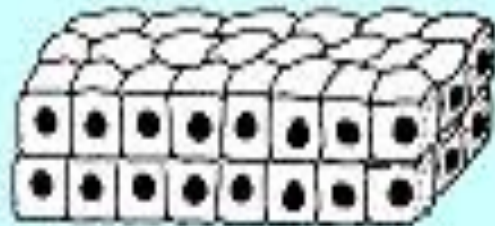
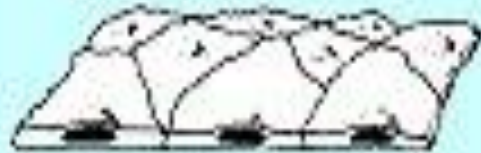
Stratified columnar

Basement membrane



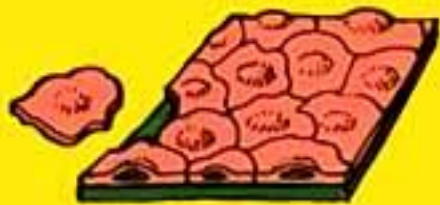
Simple columnar





SIMPLE

STRATIFIED



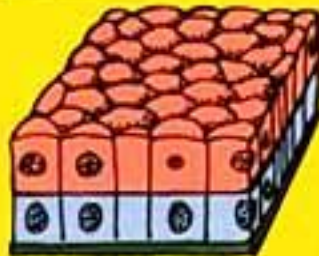
Squamous



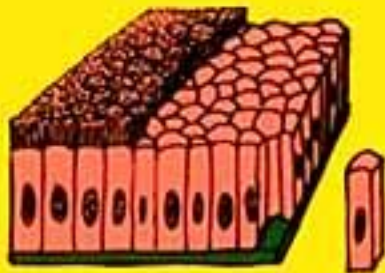
Pseudostratified Columnar



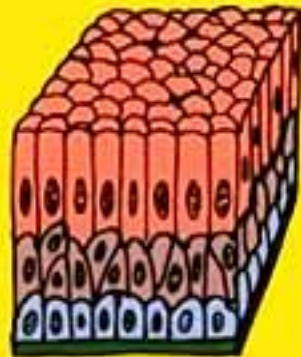
Cuboidal



Transitional

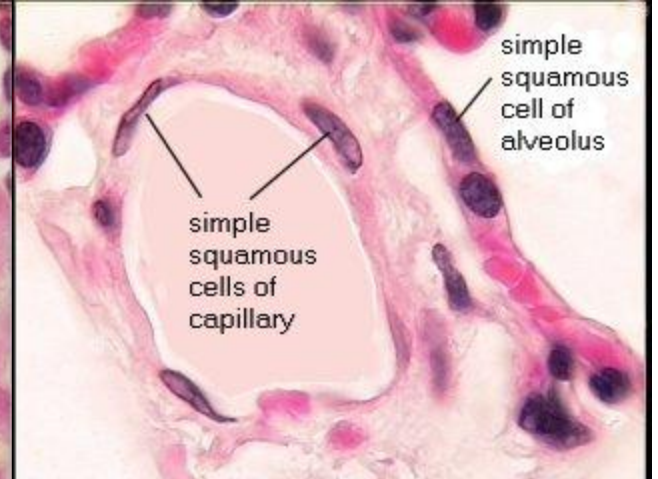
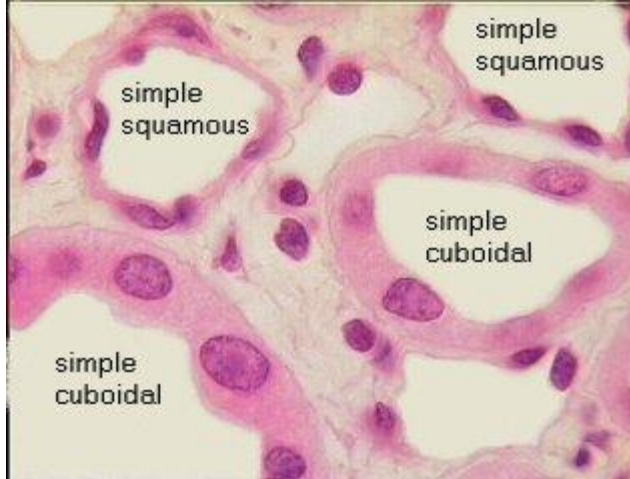
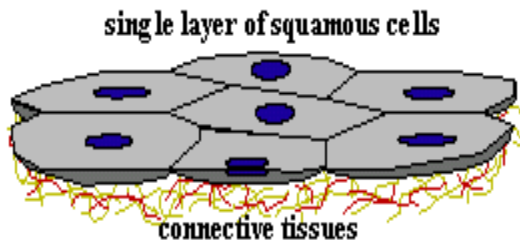


Columnar

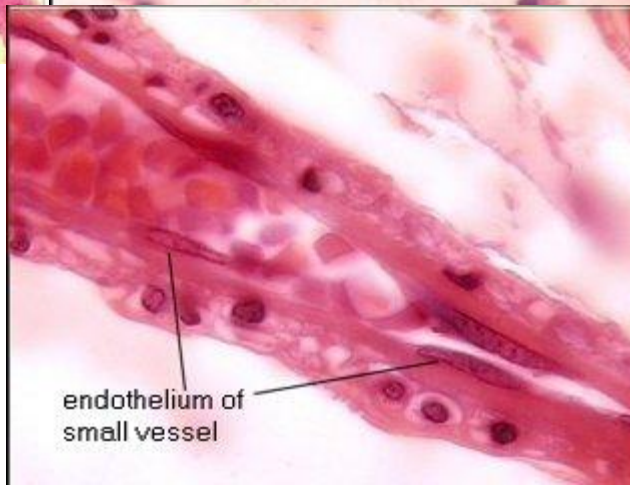
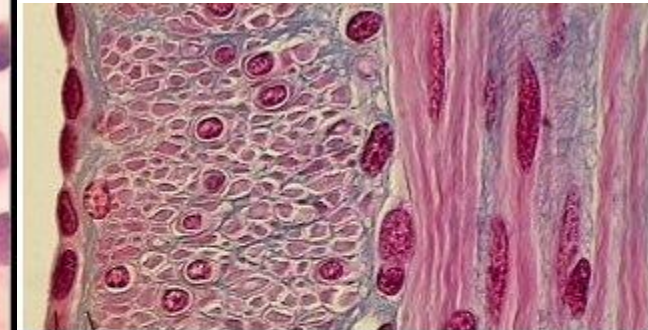
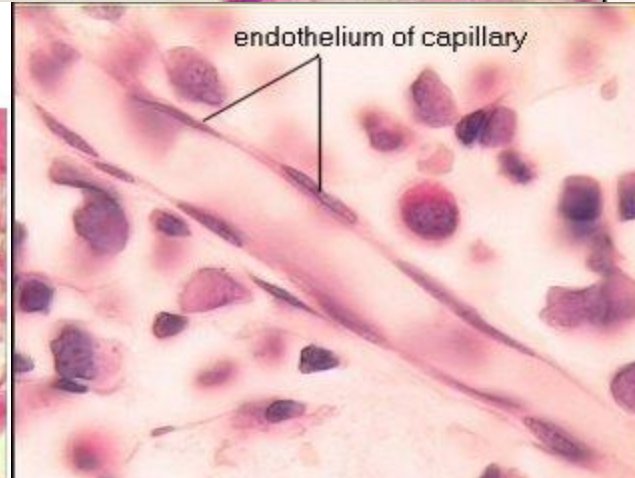
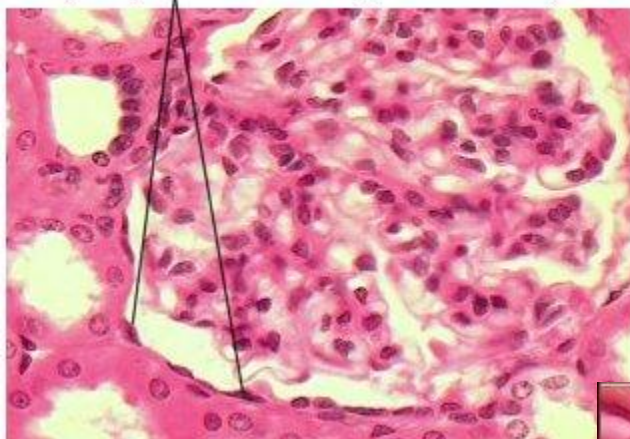


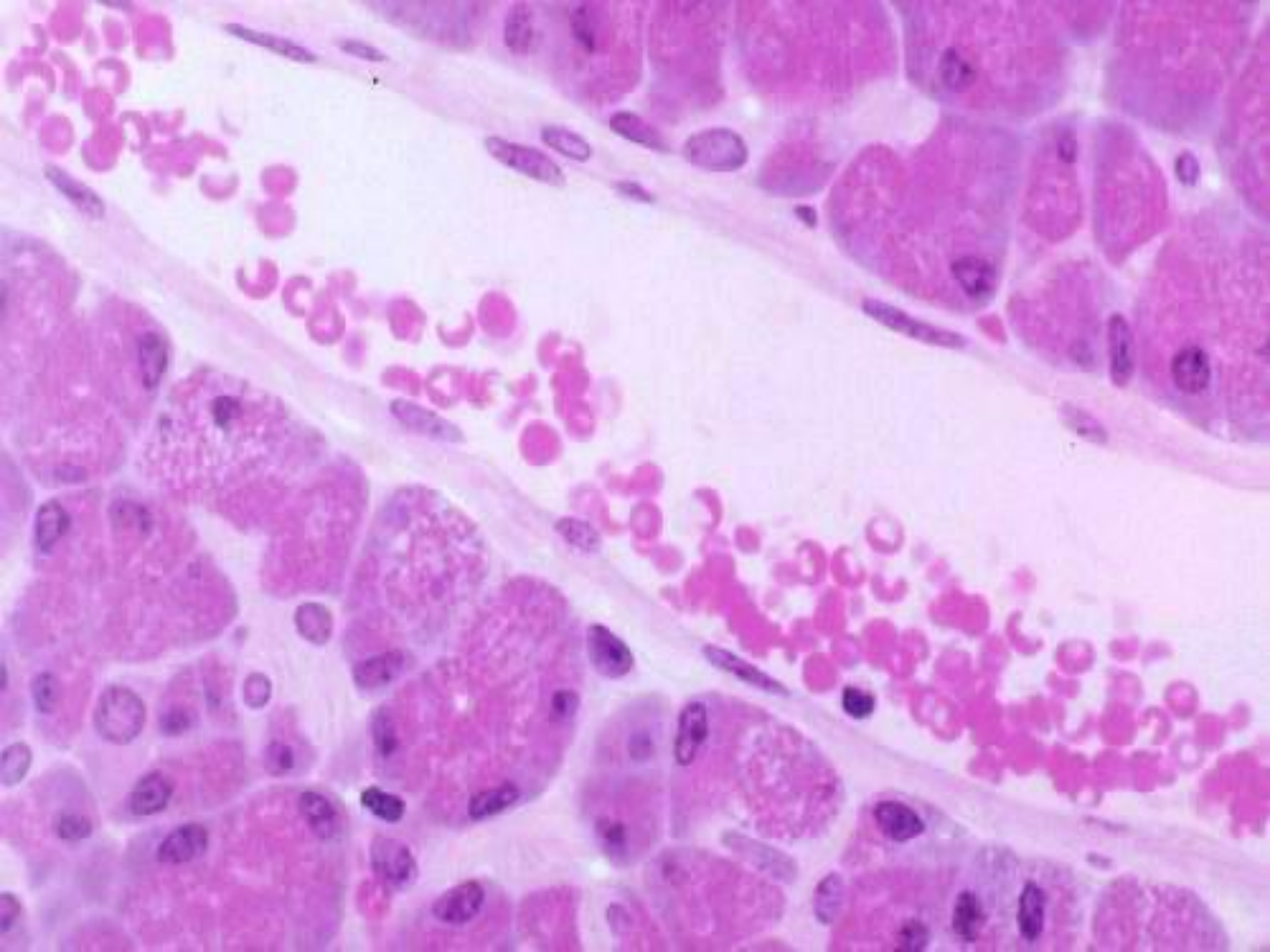
Epithelia

Figure 1. Classification of the eight types of epithelia.



simple squamous cells lining Bowman's Capsule

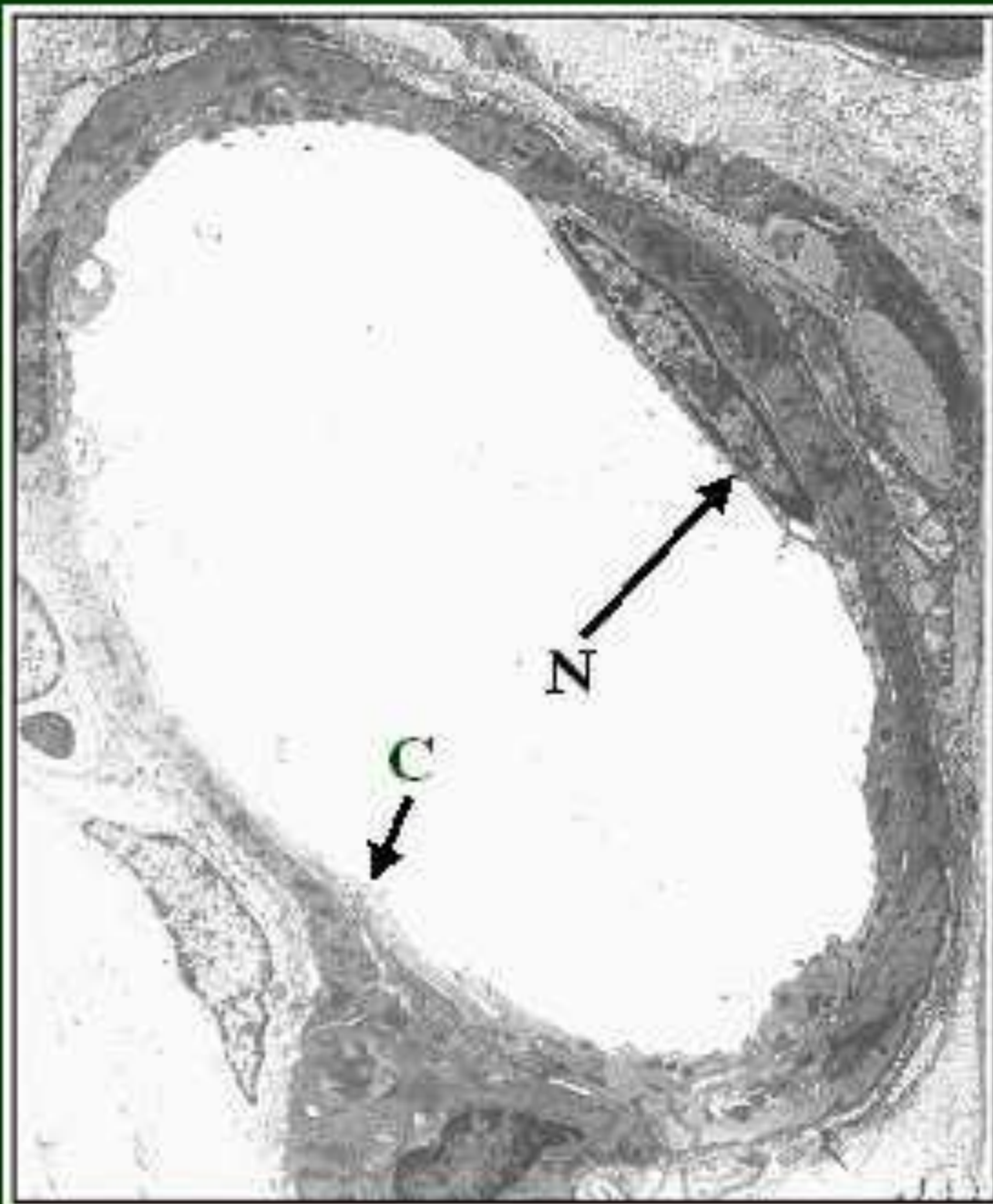




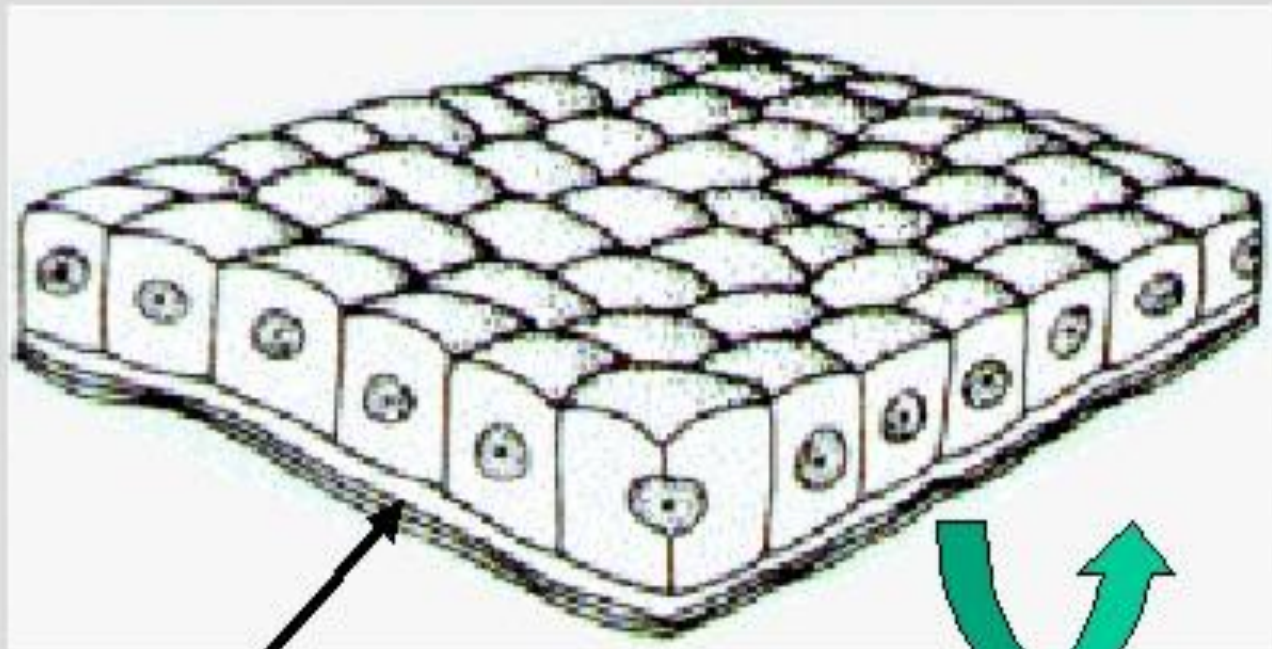
EM, Endothelium

- ★ Simple squamous epithelium, endothelium

The lining of this small blood vessel is a simple squamous cell whose nucleus (N) is flat inside the very thin cytoplasm (C).



Simple Cuboidal Epithelium

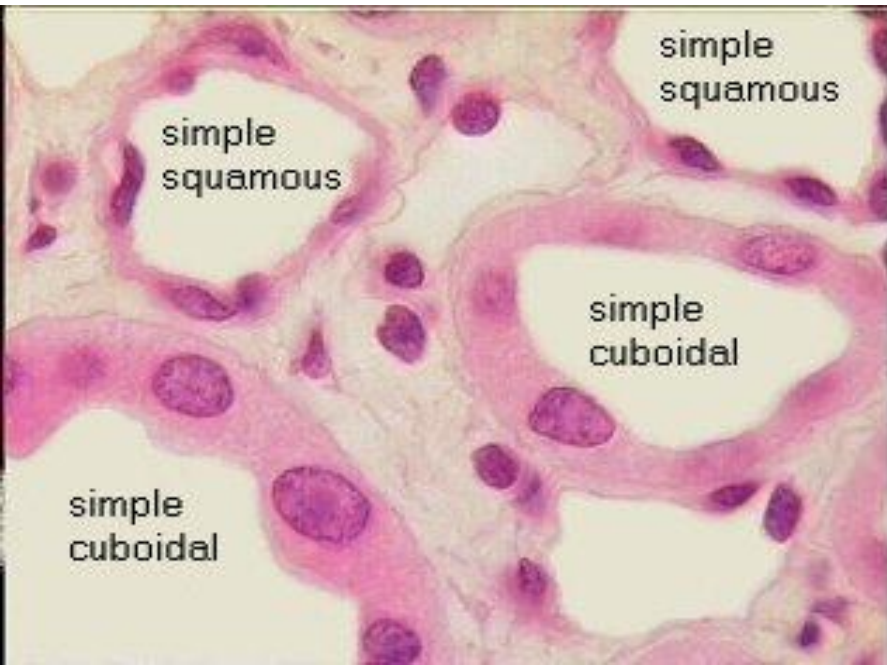
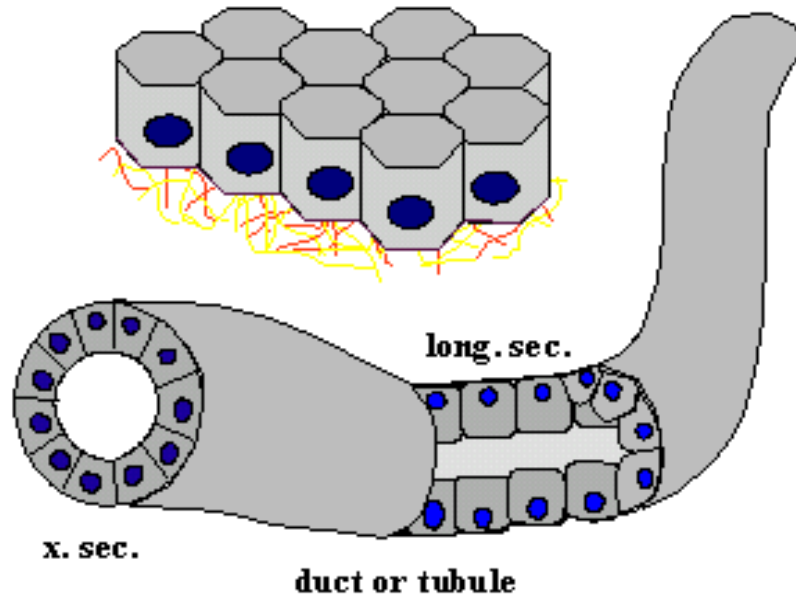


Basement
membrane

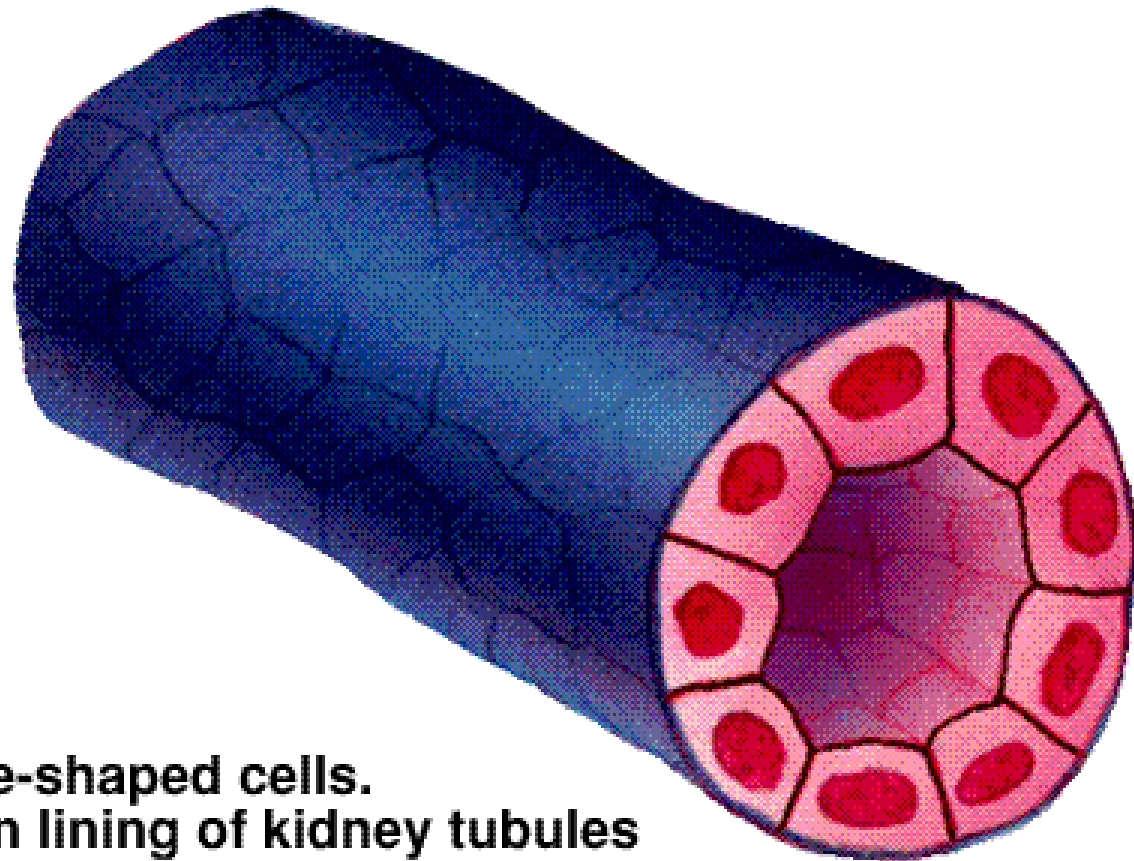
**Tissue wraps to
form tubules and
ducts of glands.**

Simple cuboidal epithelium forms ducts, tubules and secretory cells in exocrine glands and in organs such as the kidney.

Simple Cuboidal Epithelia

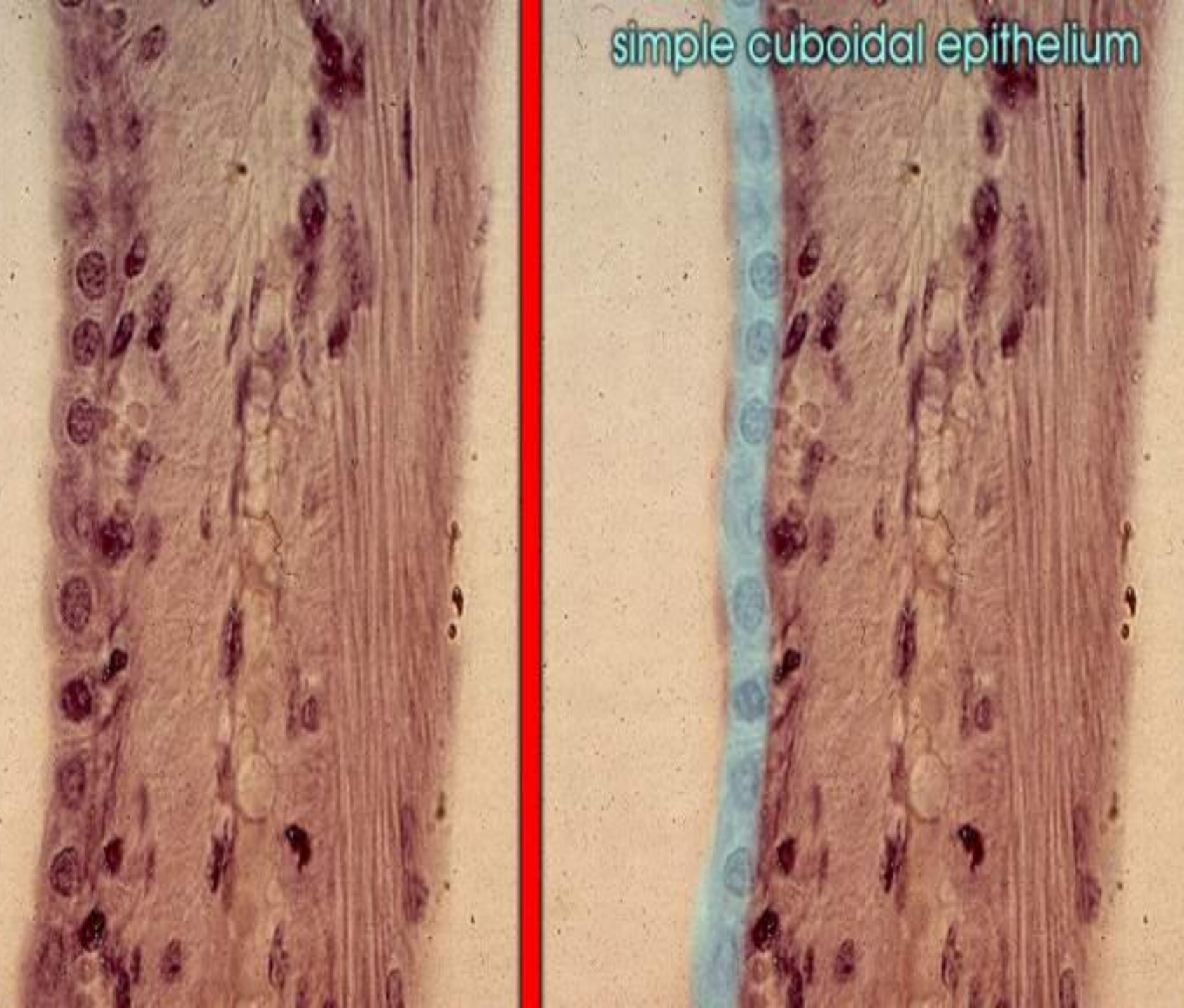


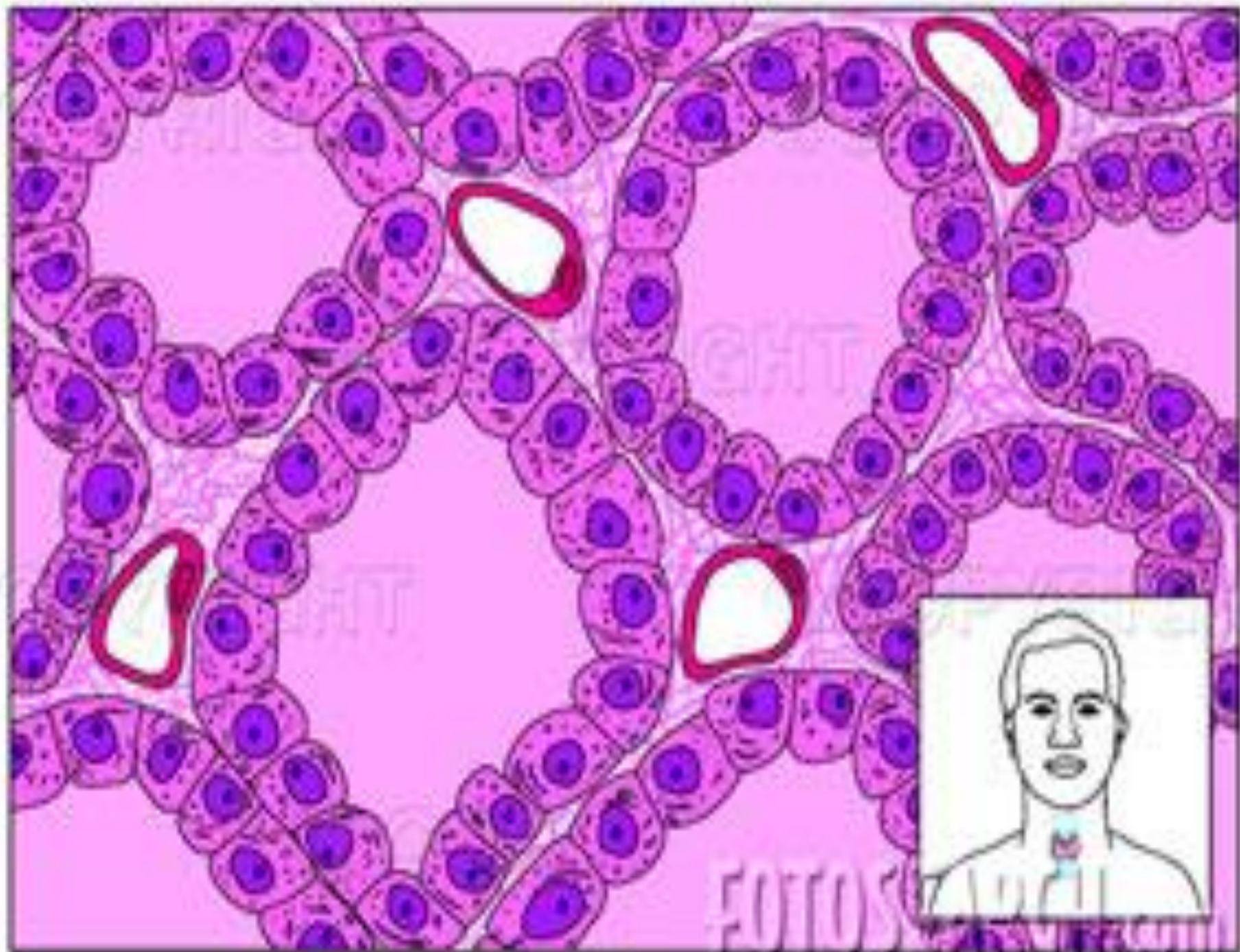
Cuboidal Epithelium



- has cube-shaped cells.
- occurs in lining of kidney tubules and on surfaces of ovaries.
- functions in protection, secretion, absorption.

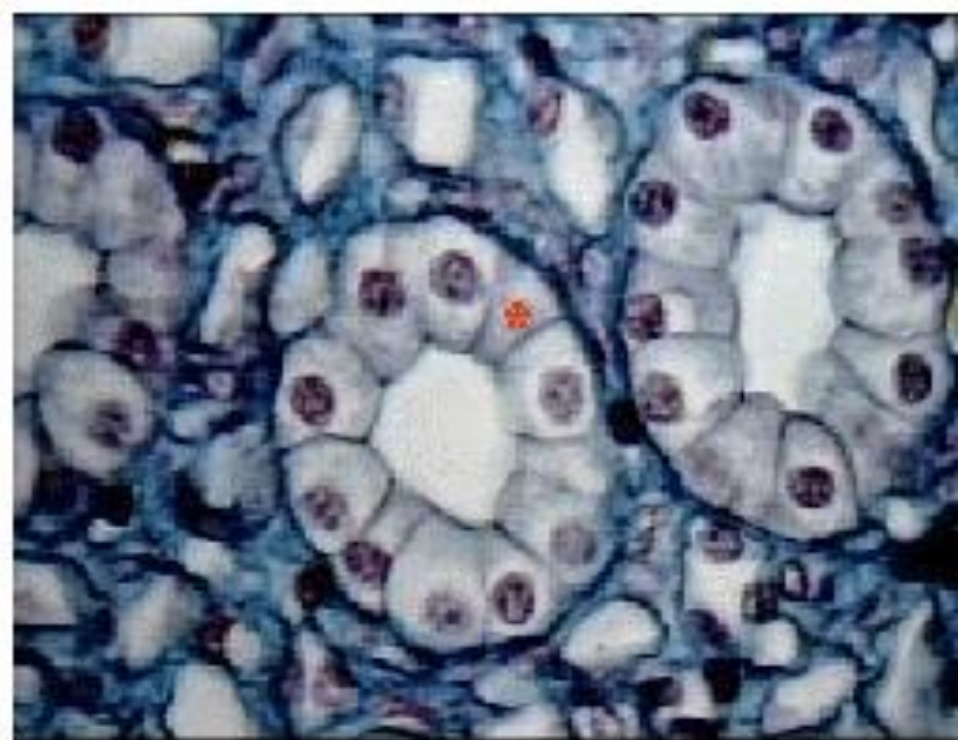
simple cuboidal epithelium

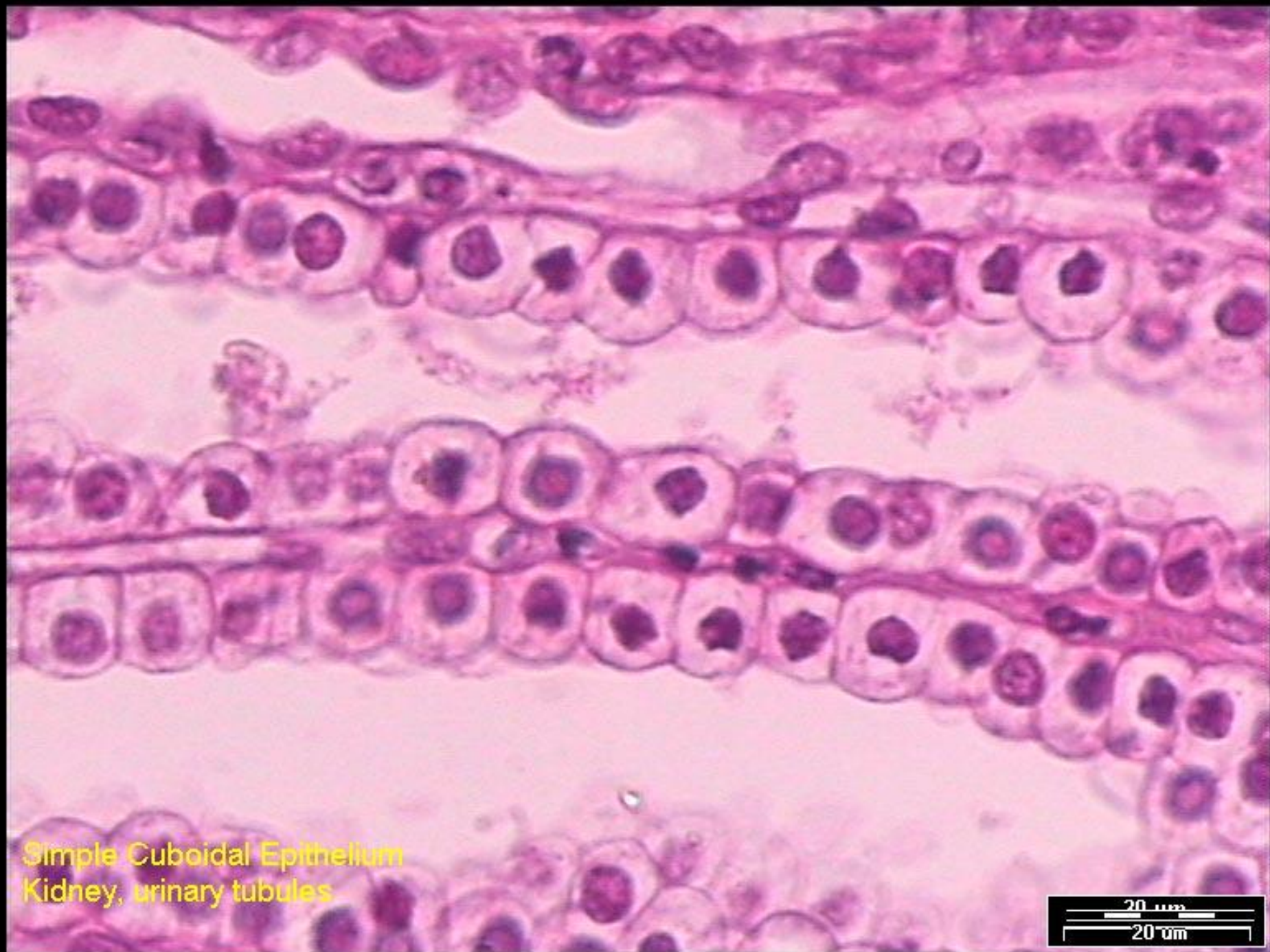




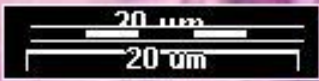
- **Simple cuboidal epithelium consists of short cube, prism or trapezoid-shaped cells (*). The nuclei are large, spherical and centrally located in the cells. This tissue often has a secretory function. Most glandular tissue is cuboidal, e.g., sweat glands, thyroid follicles.**

Simple Cuboidal Epithelium

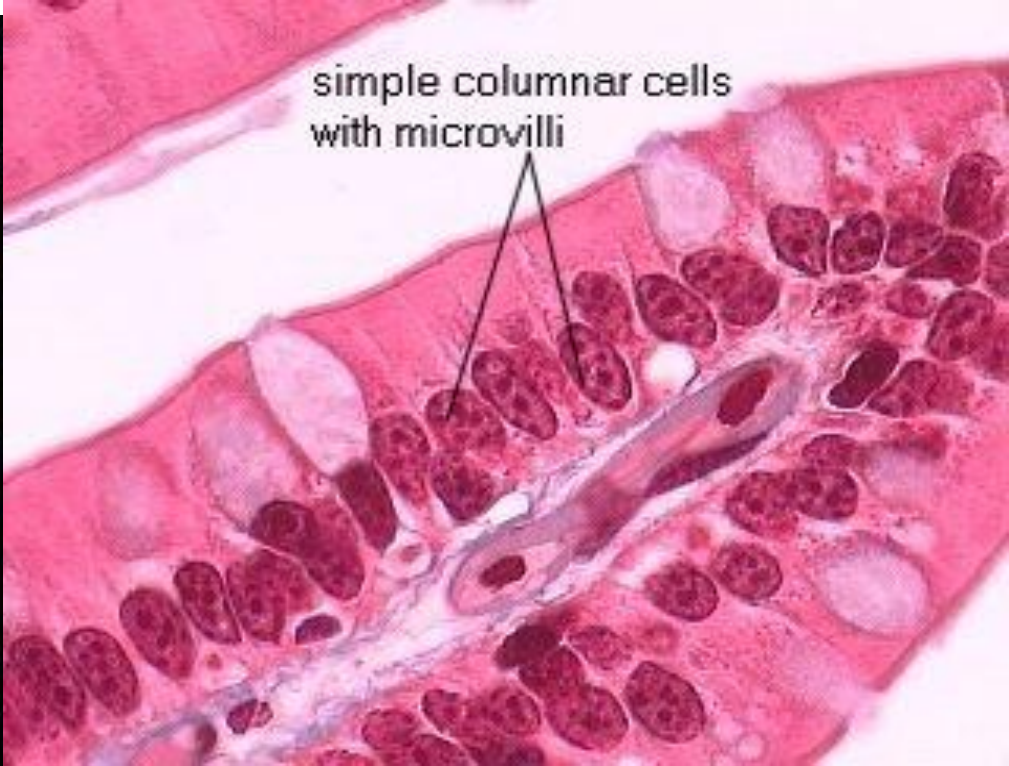
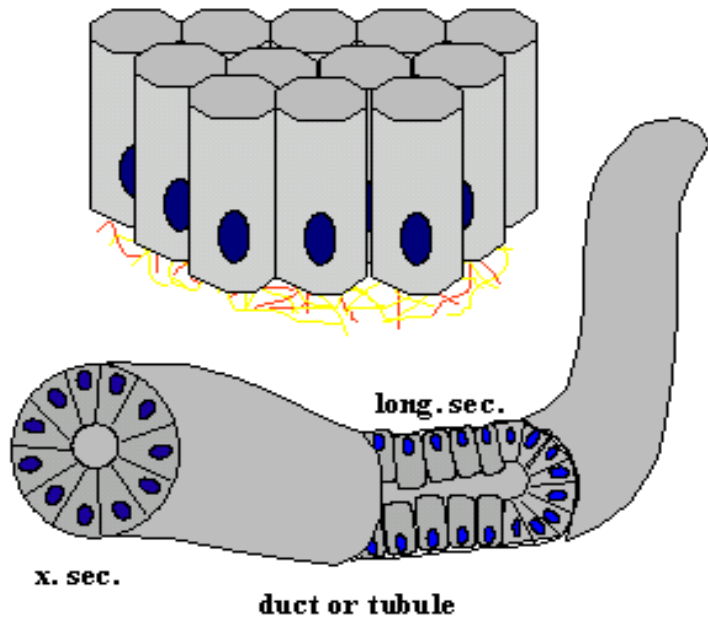


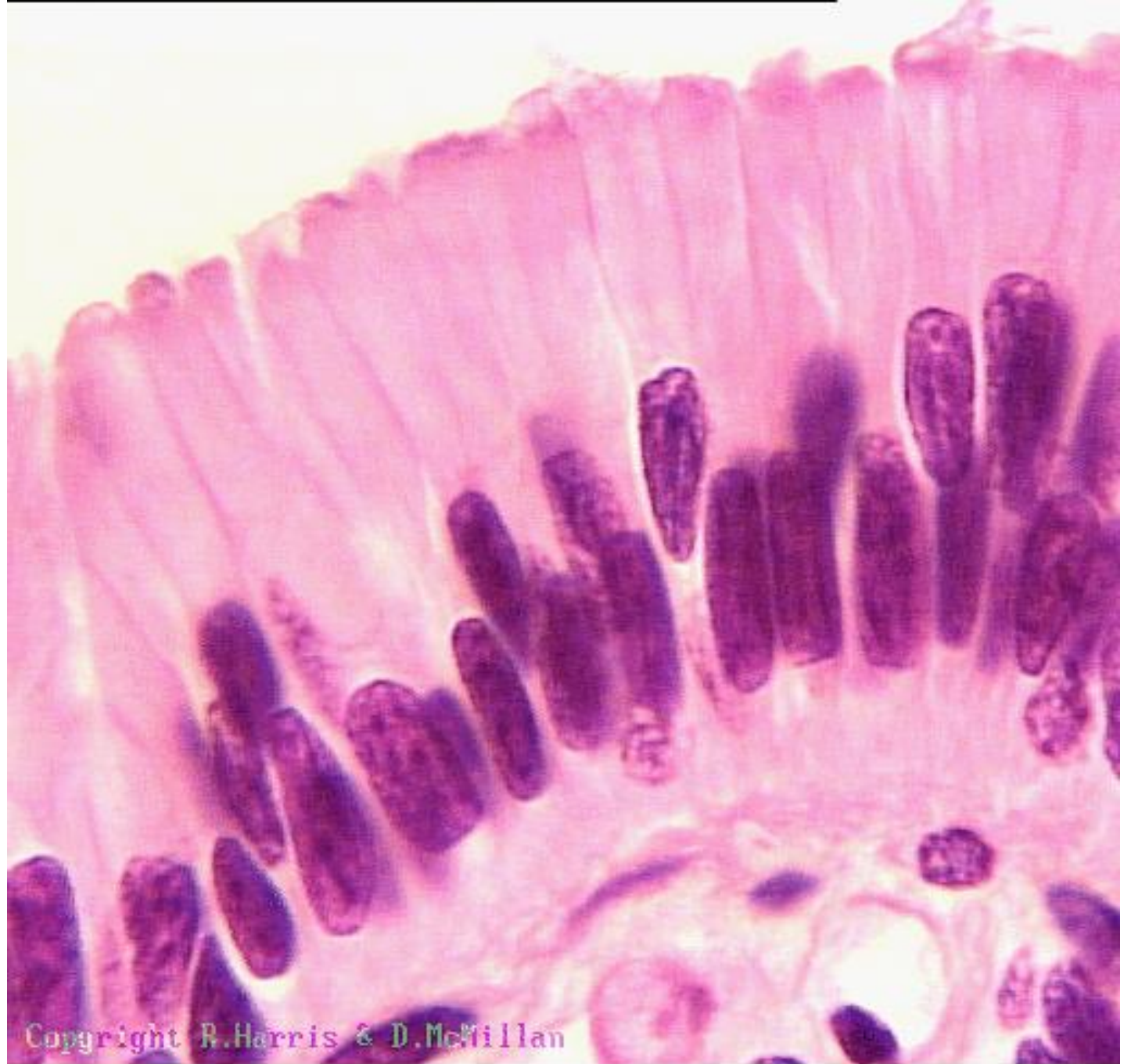


Simple Cuboidal Epithelium
Kidney, urinary tubules

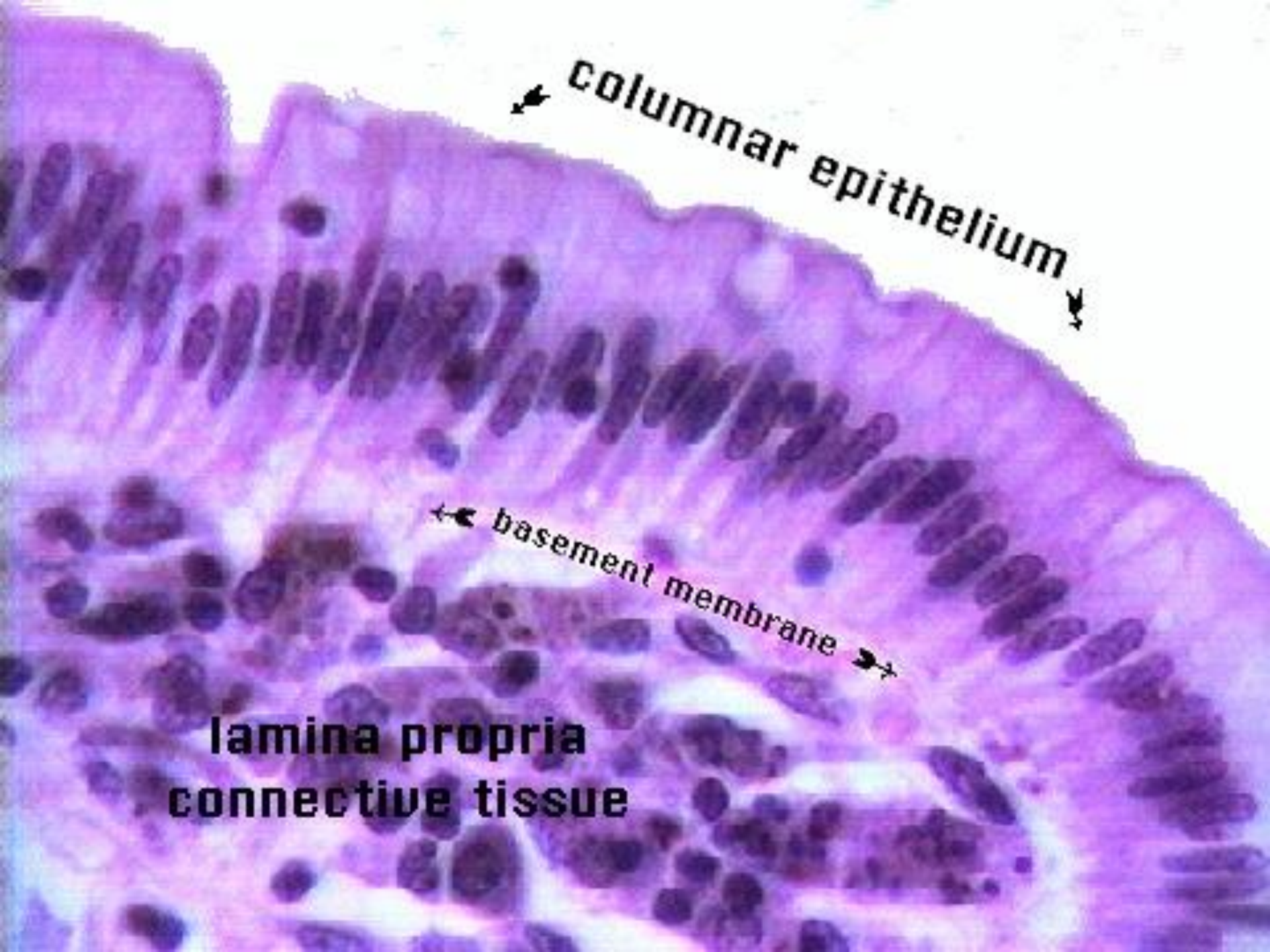


Simple Columnar Epithelia





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columnar epithelium

basement membrane

lamina propria
connective tissue

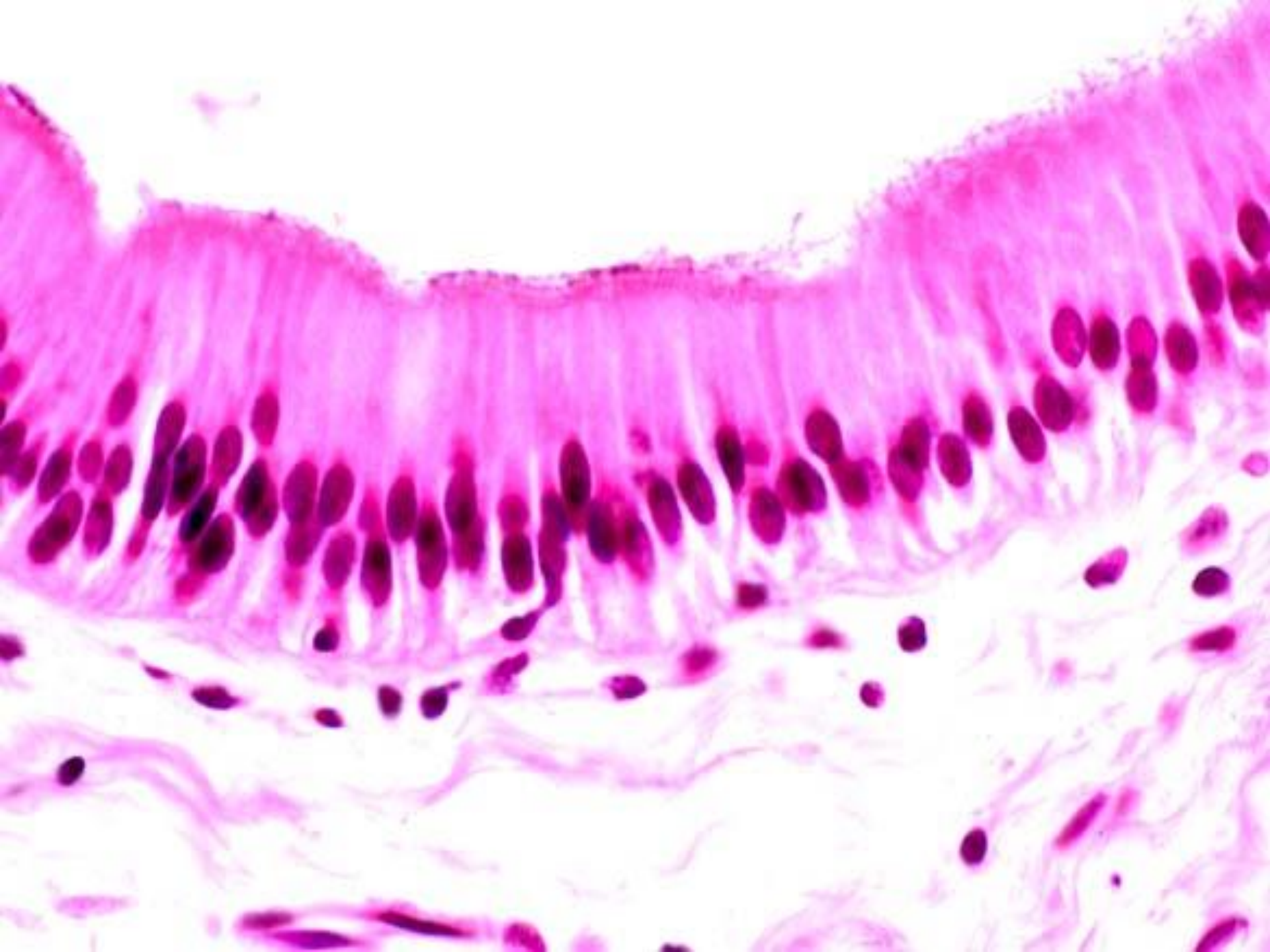


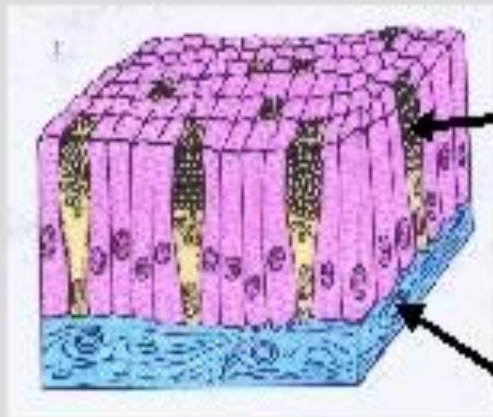






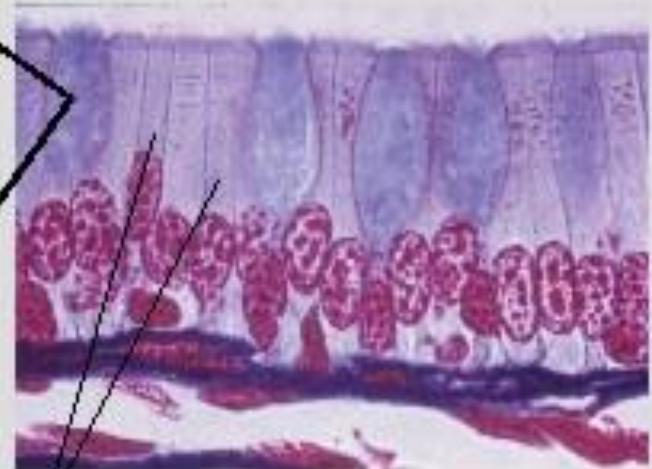
Figure 2. Three-dimensional representation of simple columnar cells showing organelles, microvillous borders (also known as brush or striate borders), and basement membranes.

Simple Columnar Epithelium in the GI Tract

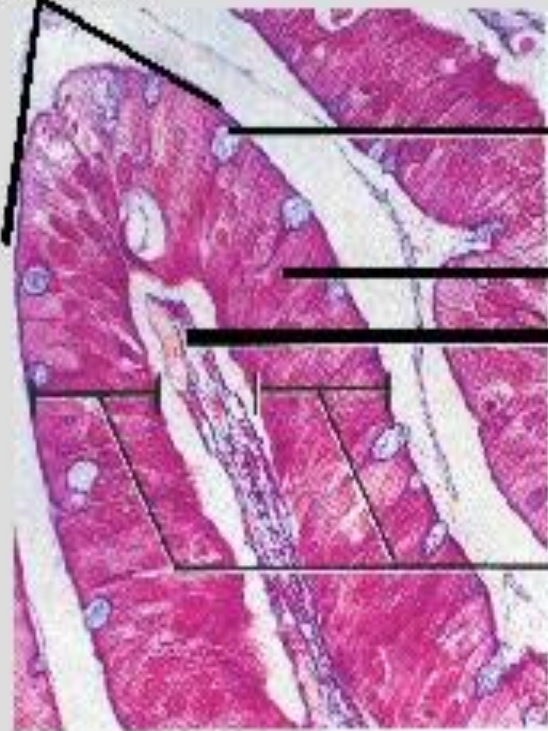


Goblet cells
secrete mucus

Basement
membrane



A villus



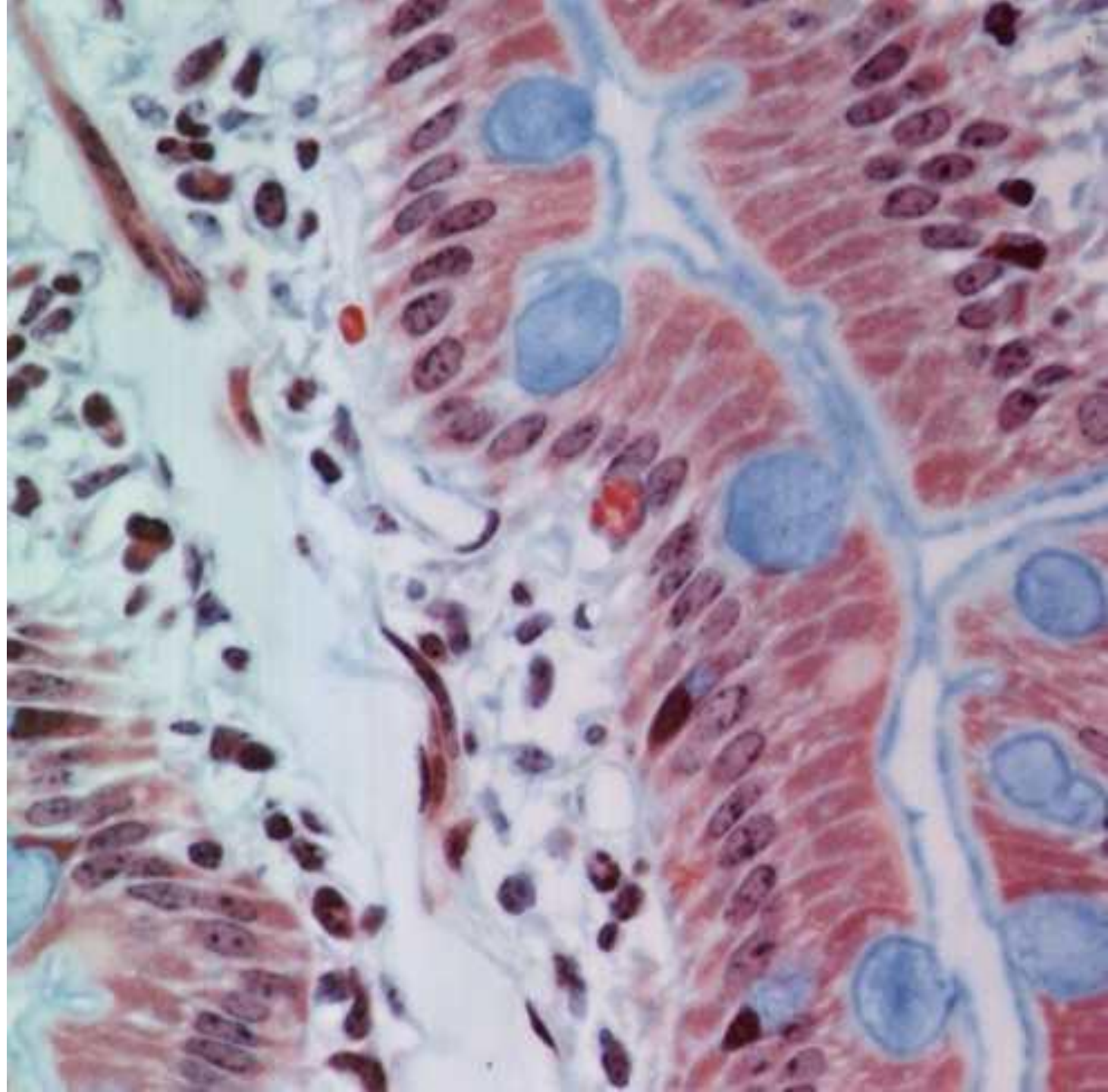
Goblet cell

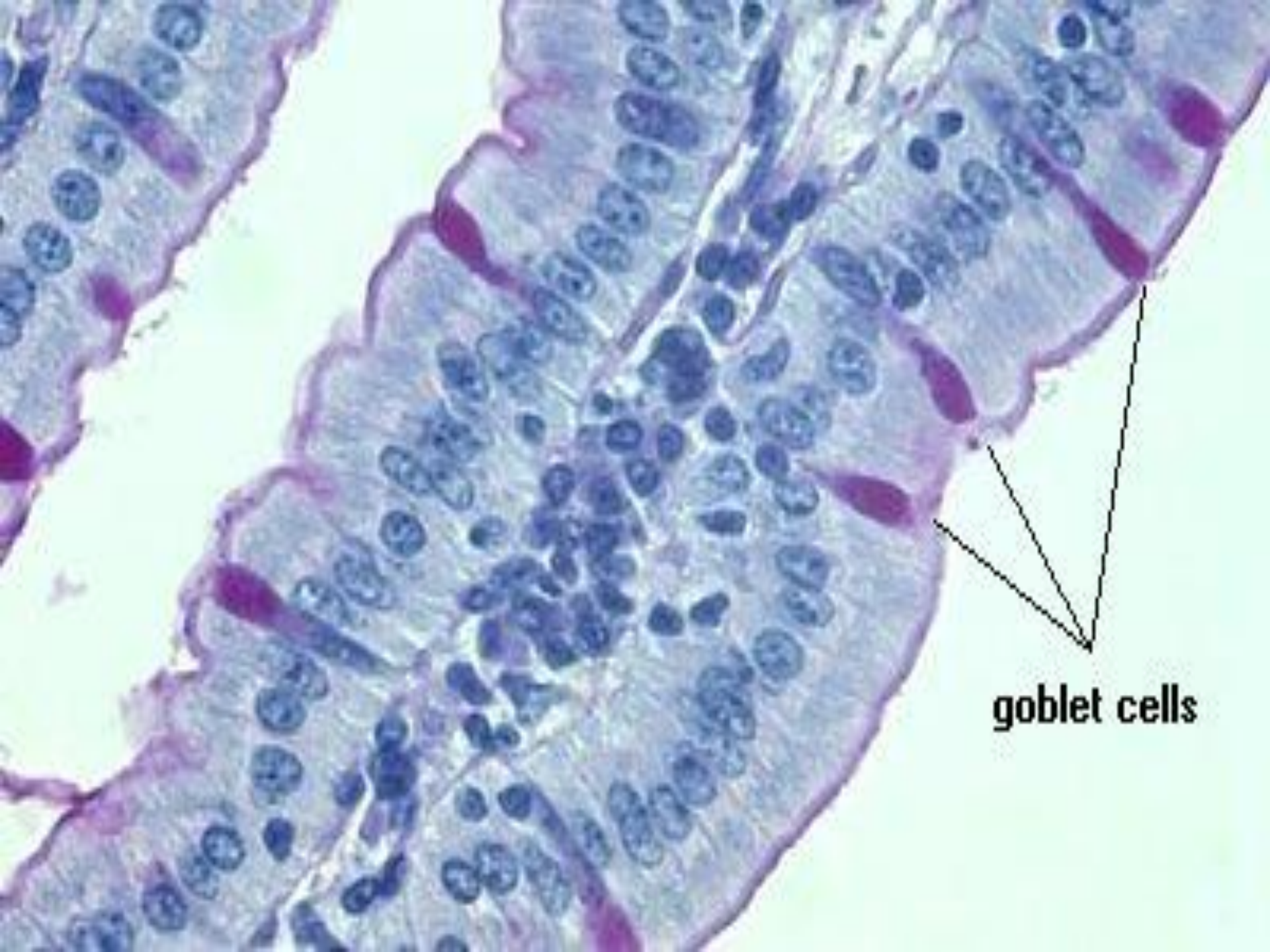
simple columnar cells

Connective tissue
(lamina propria)

epithelial
mucosa

Simple columnar epithelium forms the mucosal lining of the GI tract. Here it is shown covering the finger-like projections of the small intestine called villi.



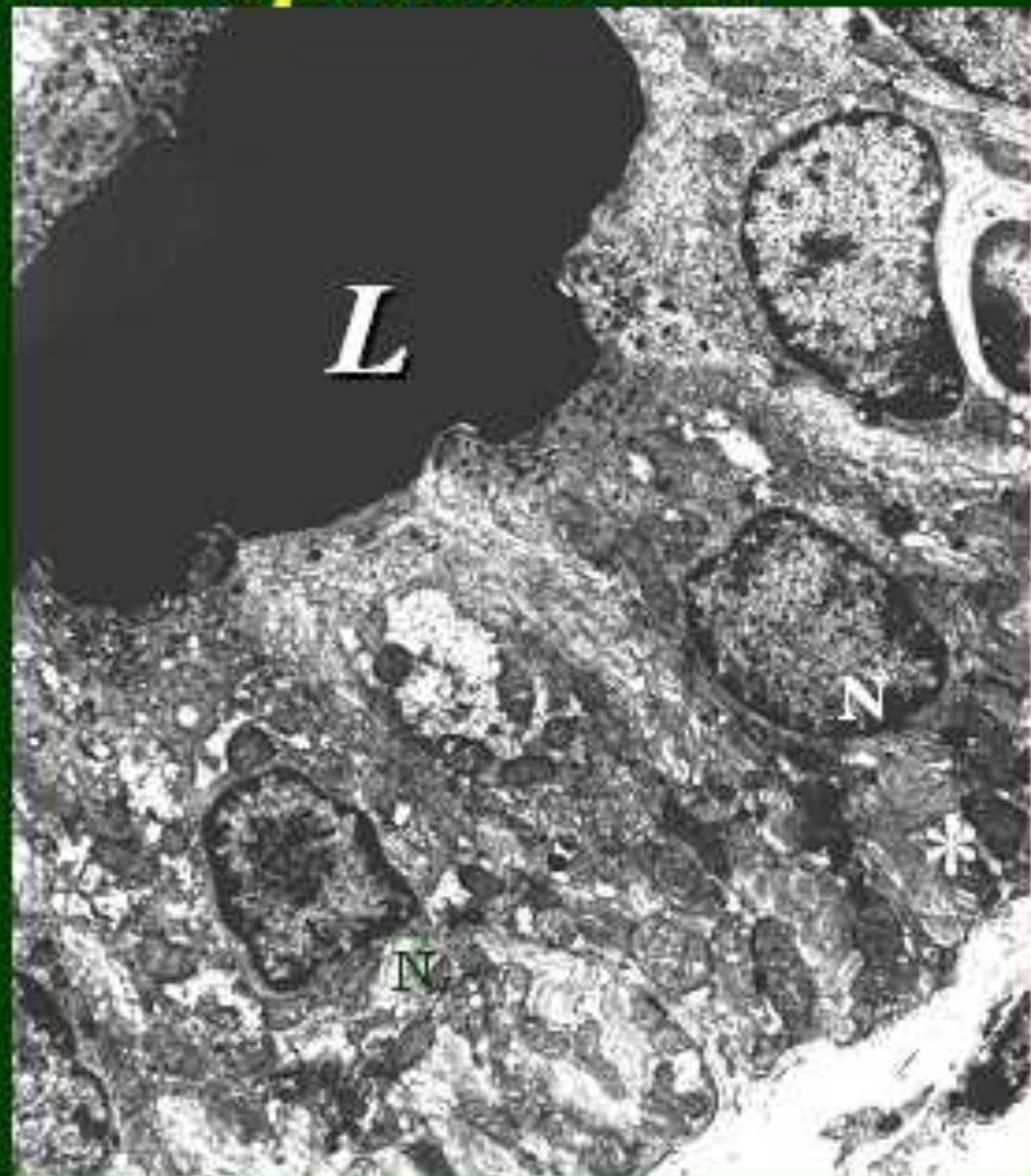


goblet cells

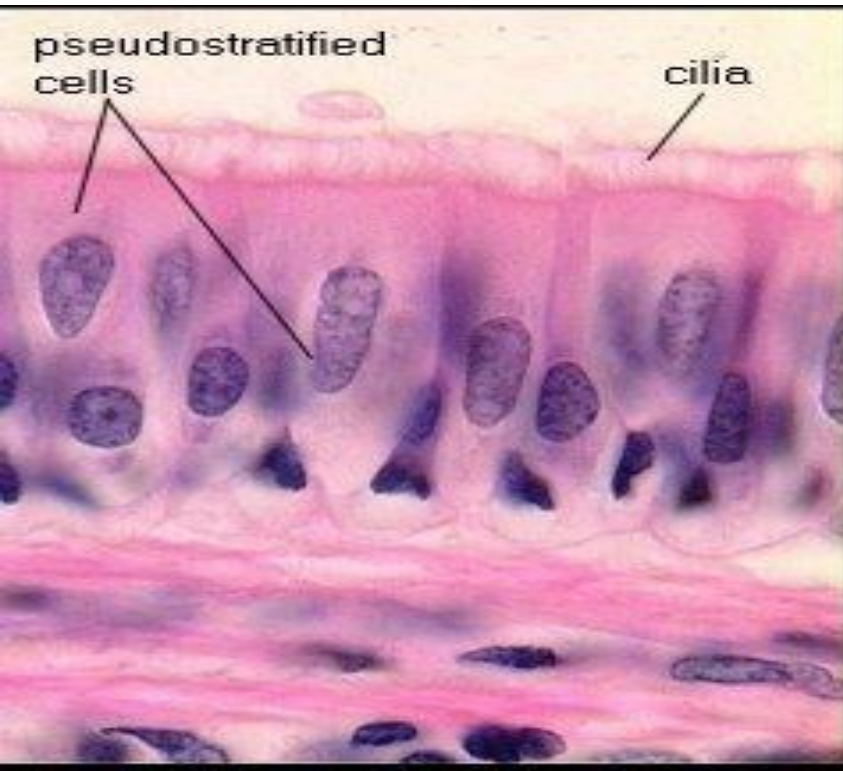
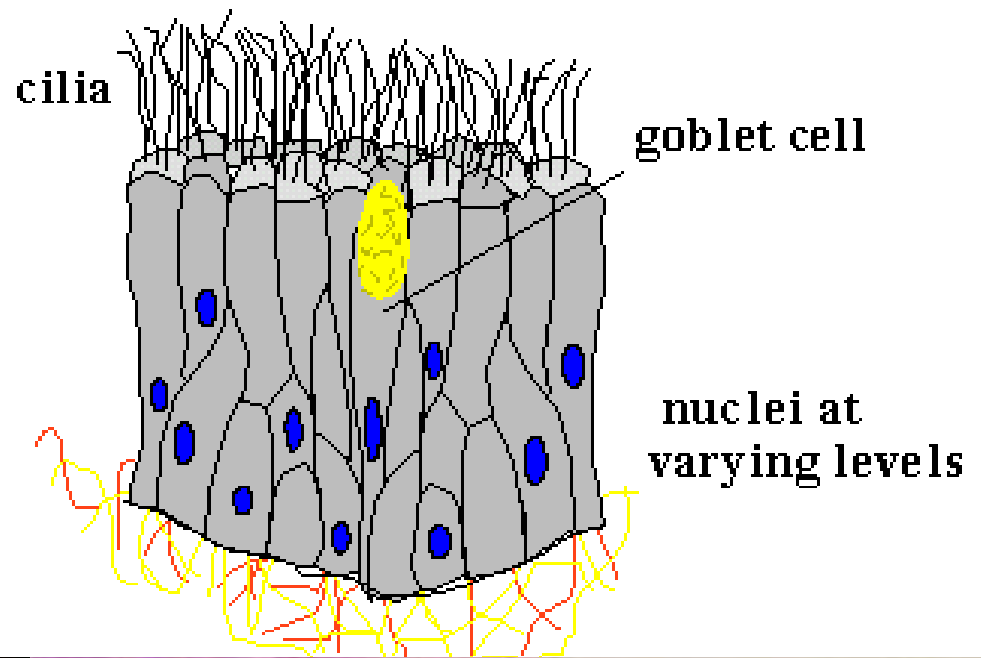
Simple columnar epithelium

- ★ Simple columnar epithelium of a striated duct, EM.

The single row of nuclei (N) in these tall narrow cells identifies this as simple columnar. Complex basal infoldings (*) of the plasma membrane is seen. The lumen (L) of the duct is filled with a protein-rich secretory product from the acinar cells.



Yalancı çok katlı prizmatik epitel





Inferior Concha Alcian blue & van Gieson

lamina propria
(connective tissue)

bone

cavernous bodies

respiratory epithelium

Inferior Concha Alcian blue & van Gieson

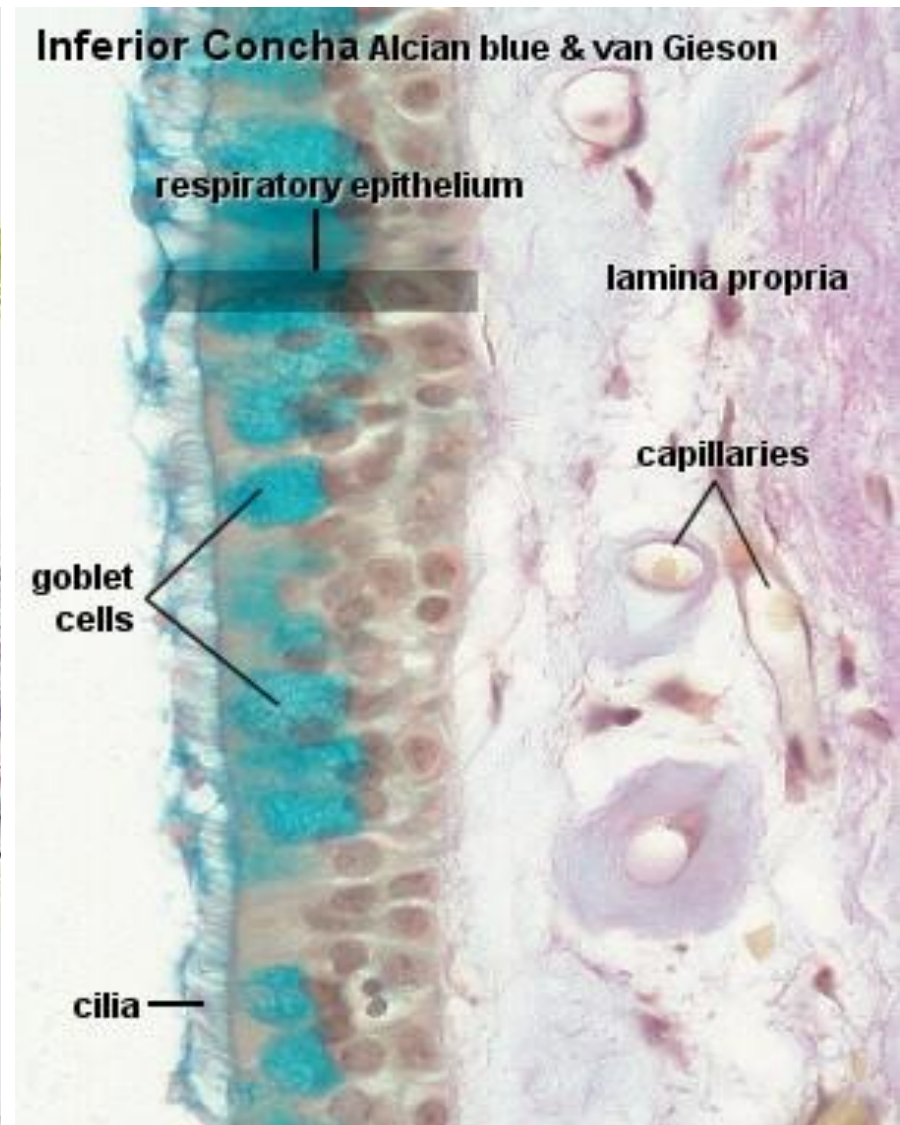
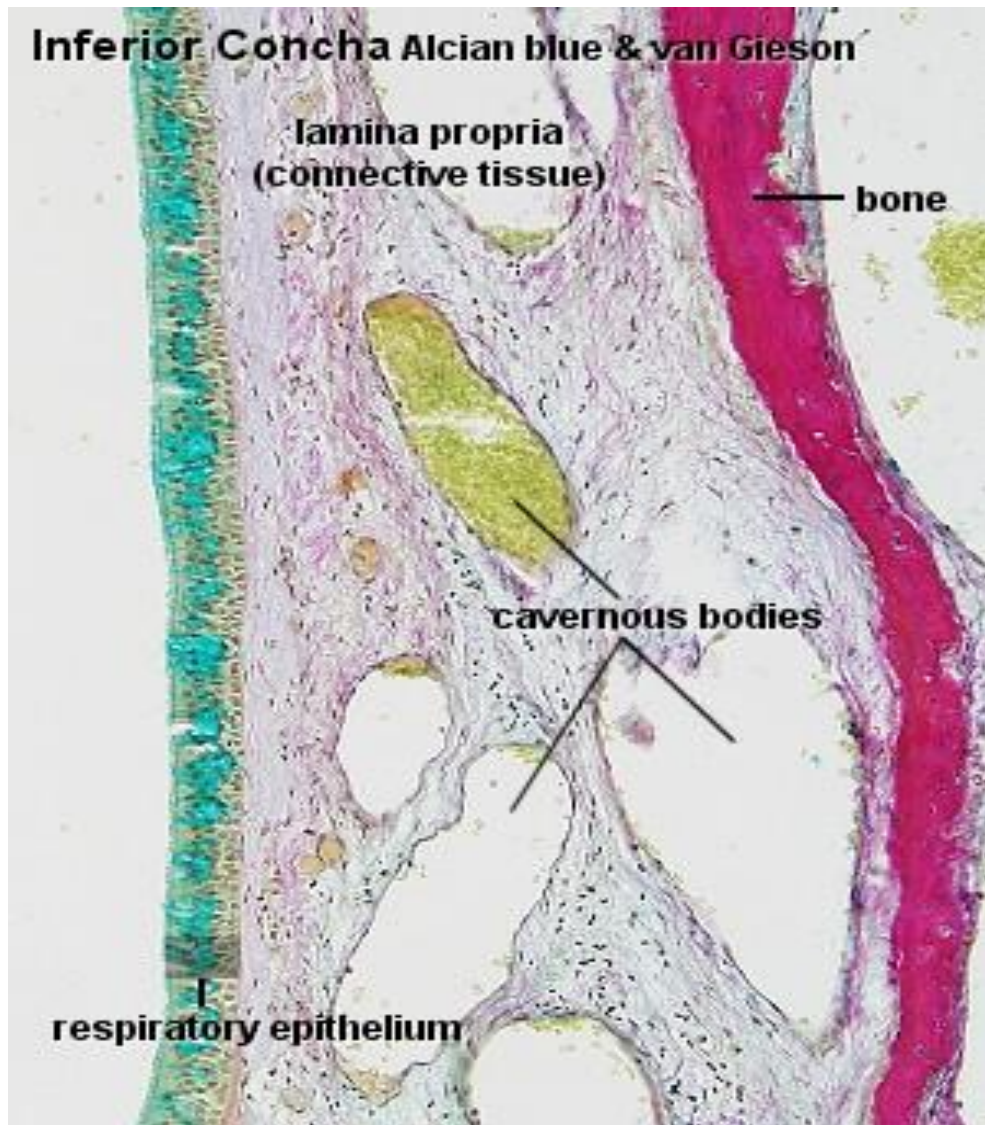
respiratory epithelium

lamina propria

capillaries

goblet
cells

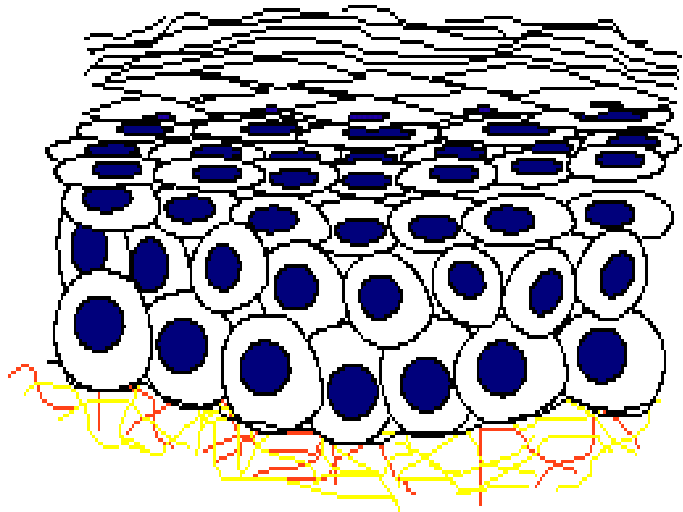
cilia



Çok katlı yassı (keratinize- nonkeratinize) epitel

keratinized stratified squamous

dead, keratinized cells at surface

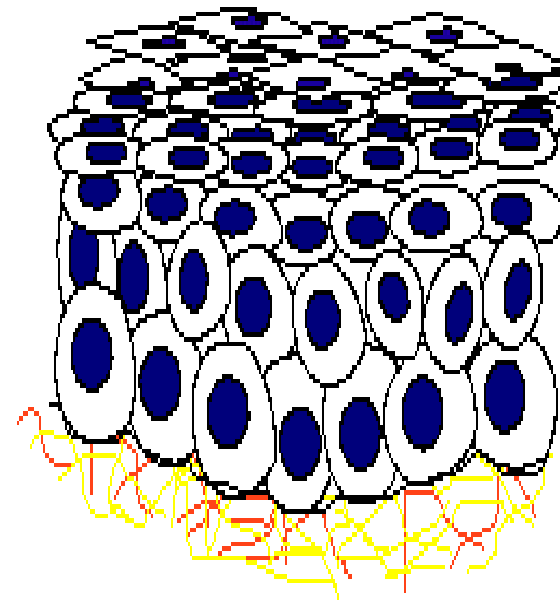


cells flatten
toward surface

↑
mitotic divisions

non-keratinized stratified squamous

living, nucleated cells at surface

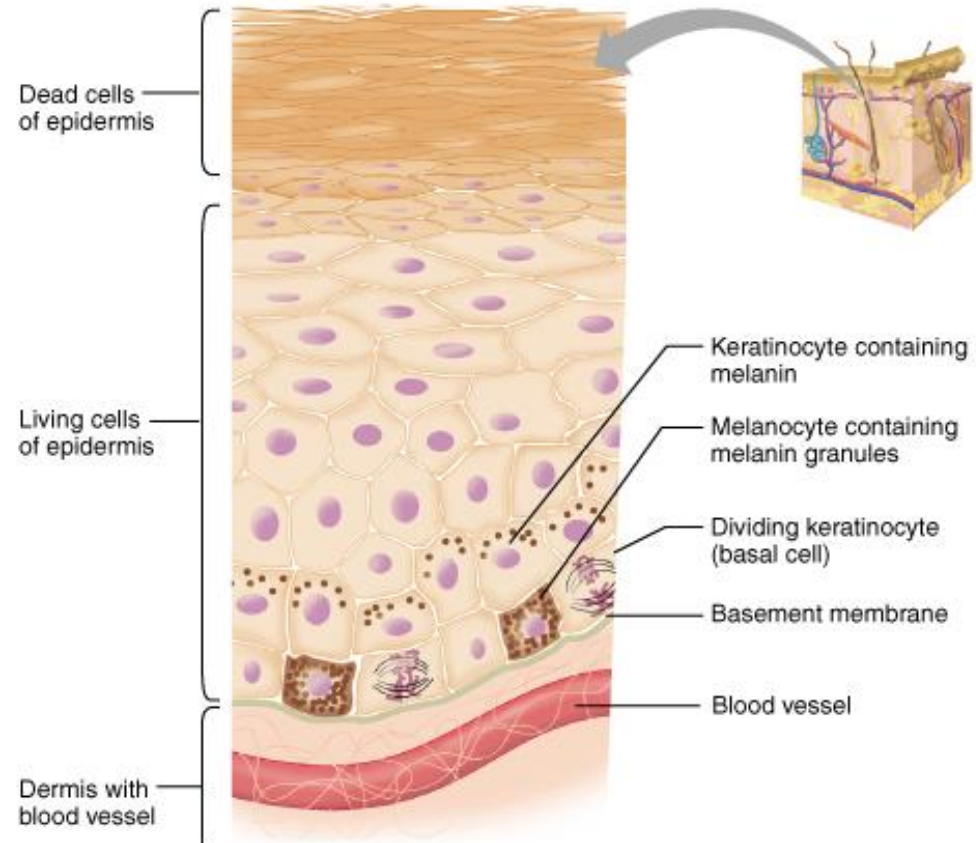


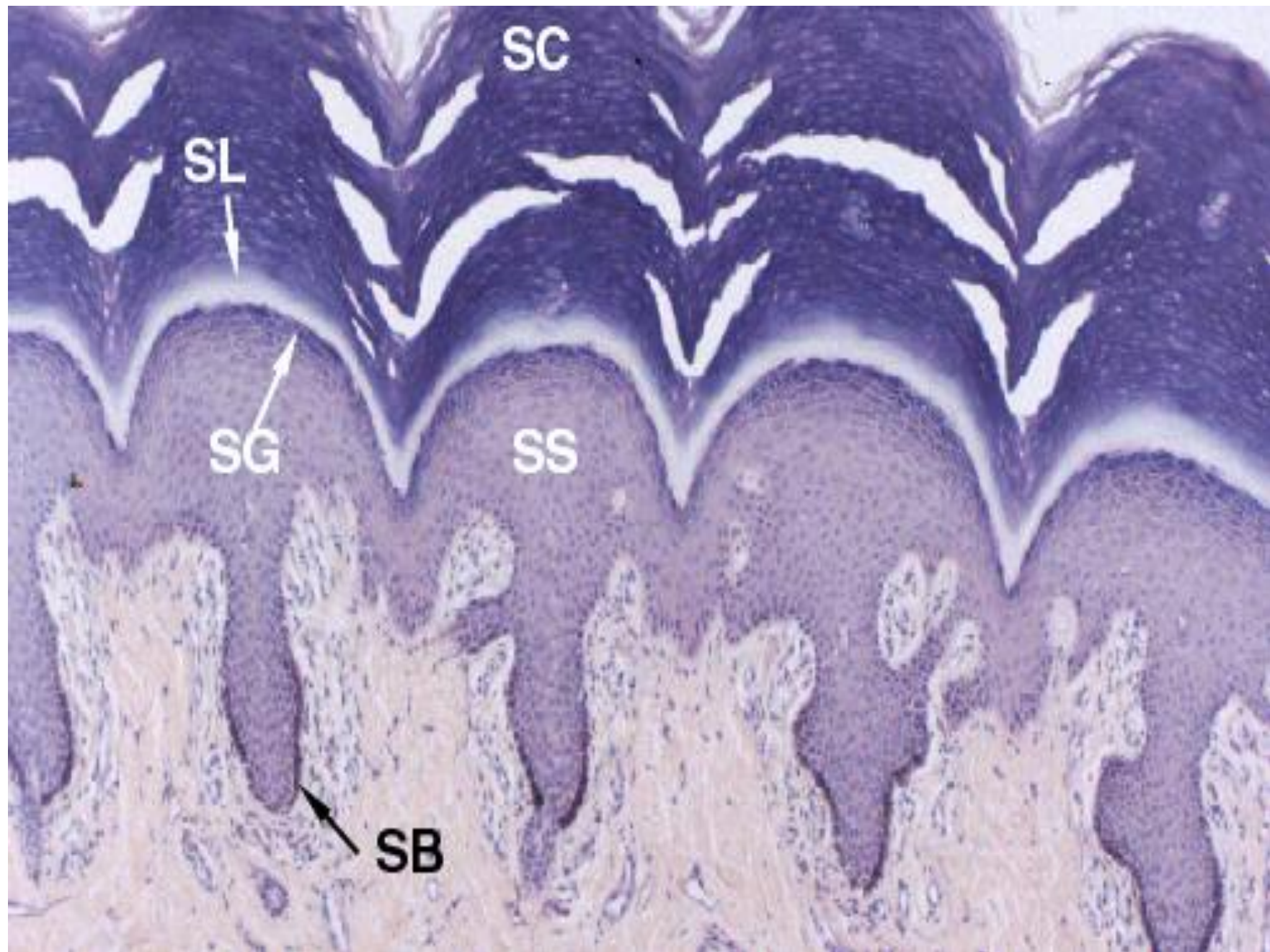
cells flatten
toward surface

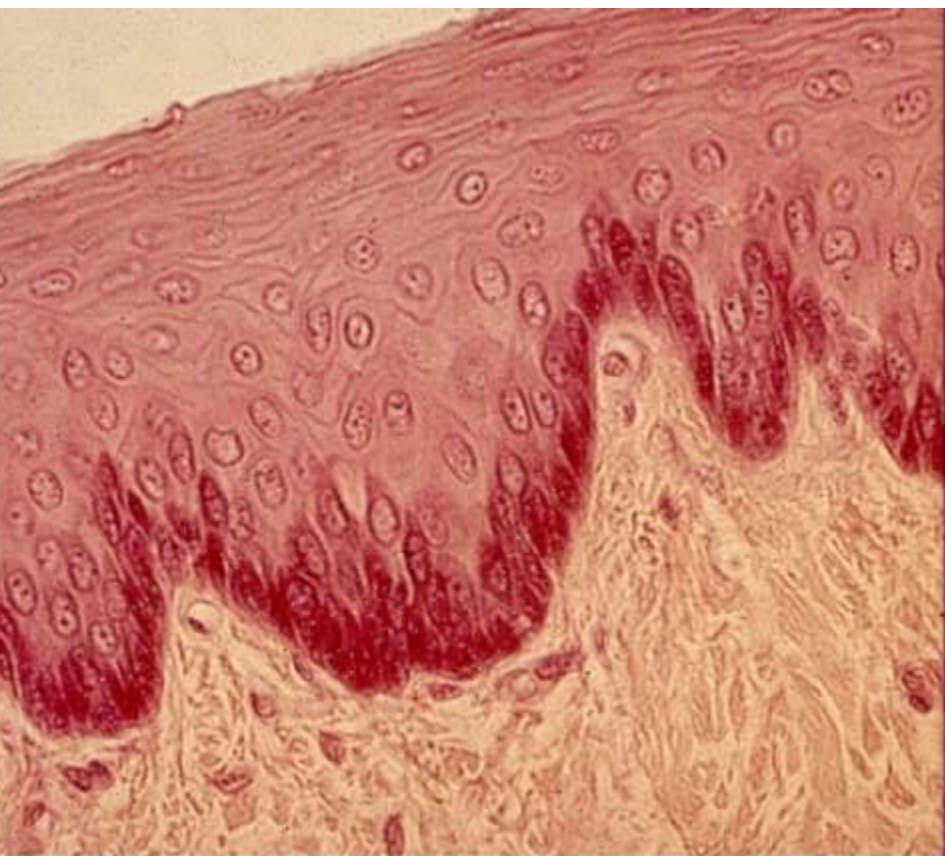
↑
mitotic divisions

Çok katlı yassı keratinize epitel

- Keratin
- Mikroskobik papilla

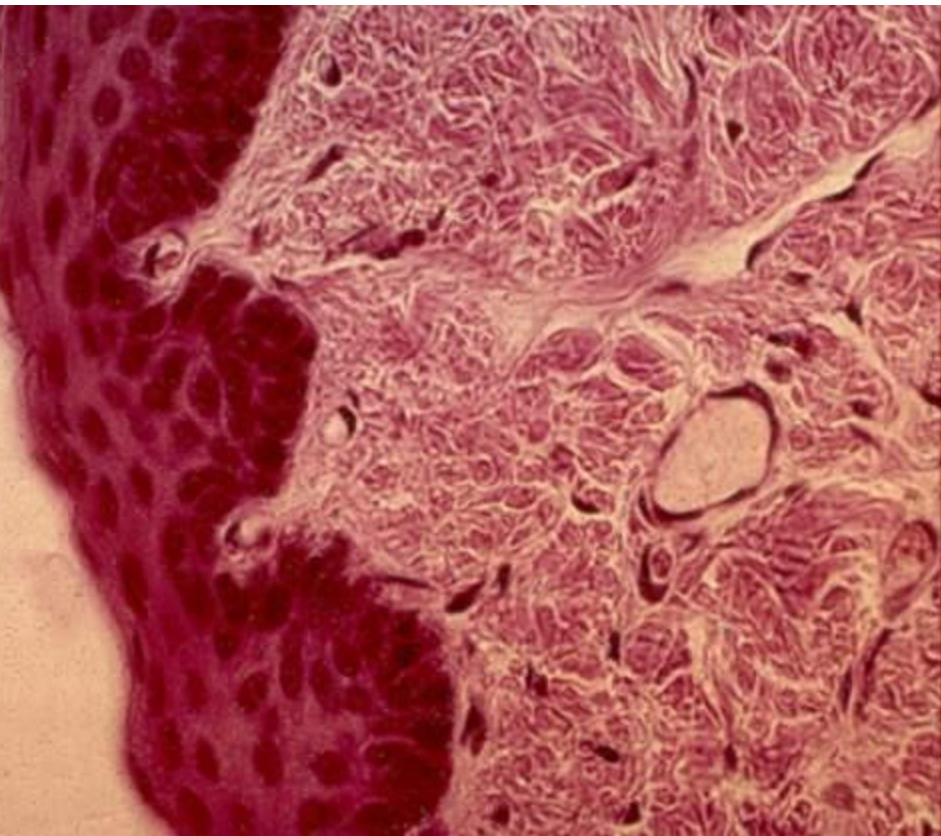




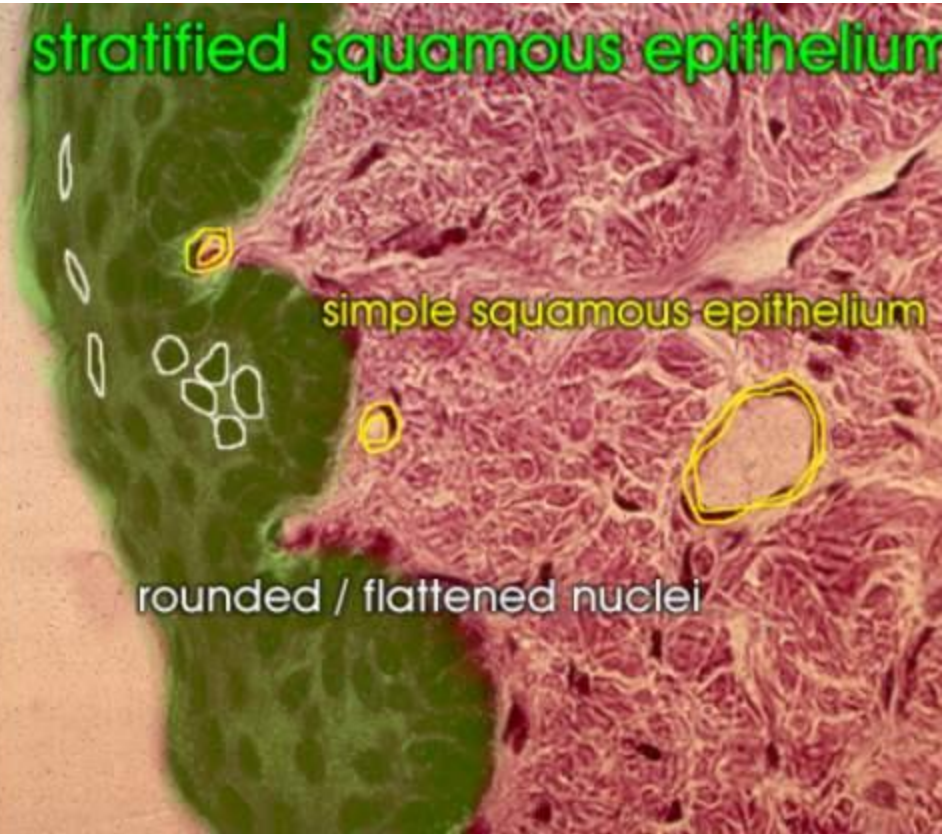


stratified squamous epithelium



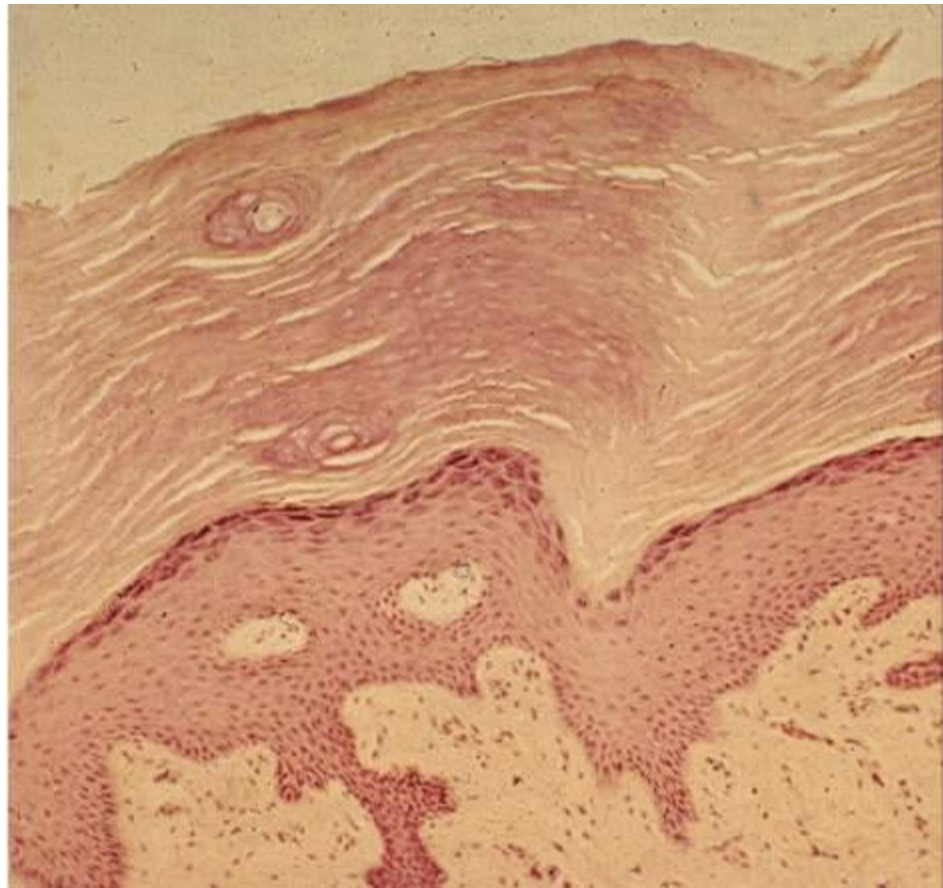


stratified squamous epithelium



simple squamous epithelium

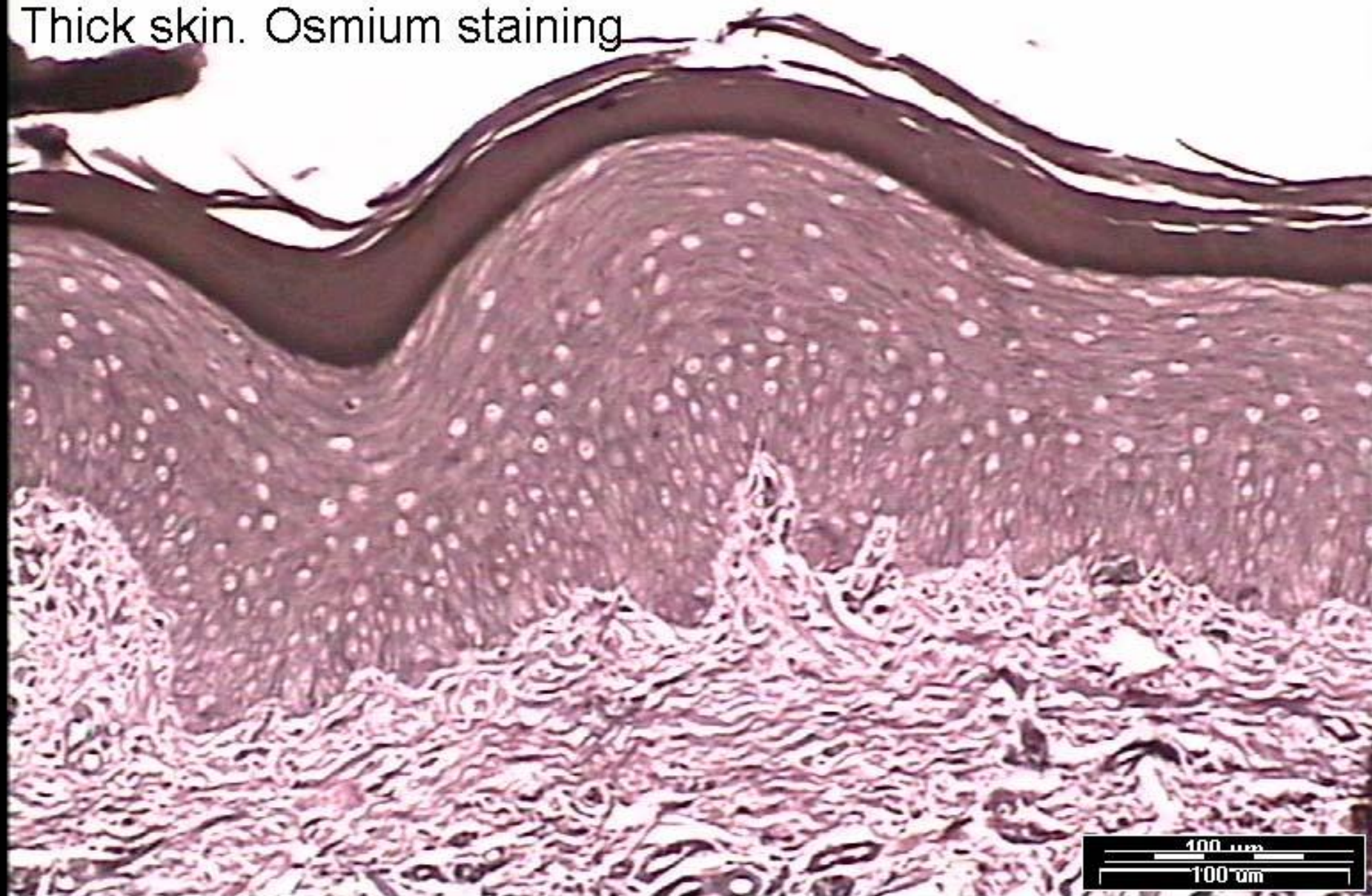
rounded / flattened nuclei

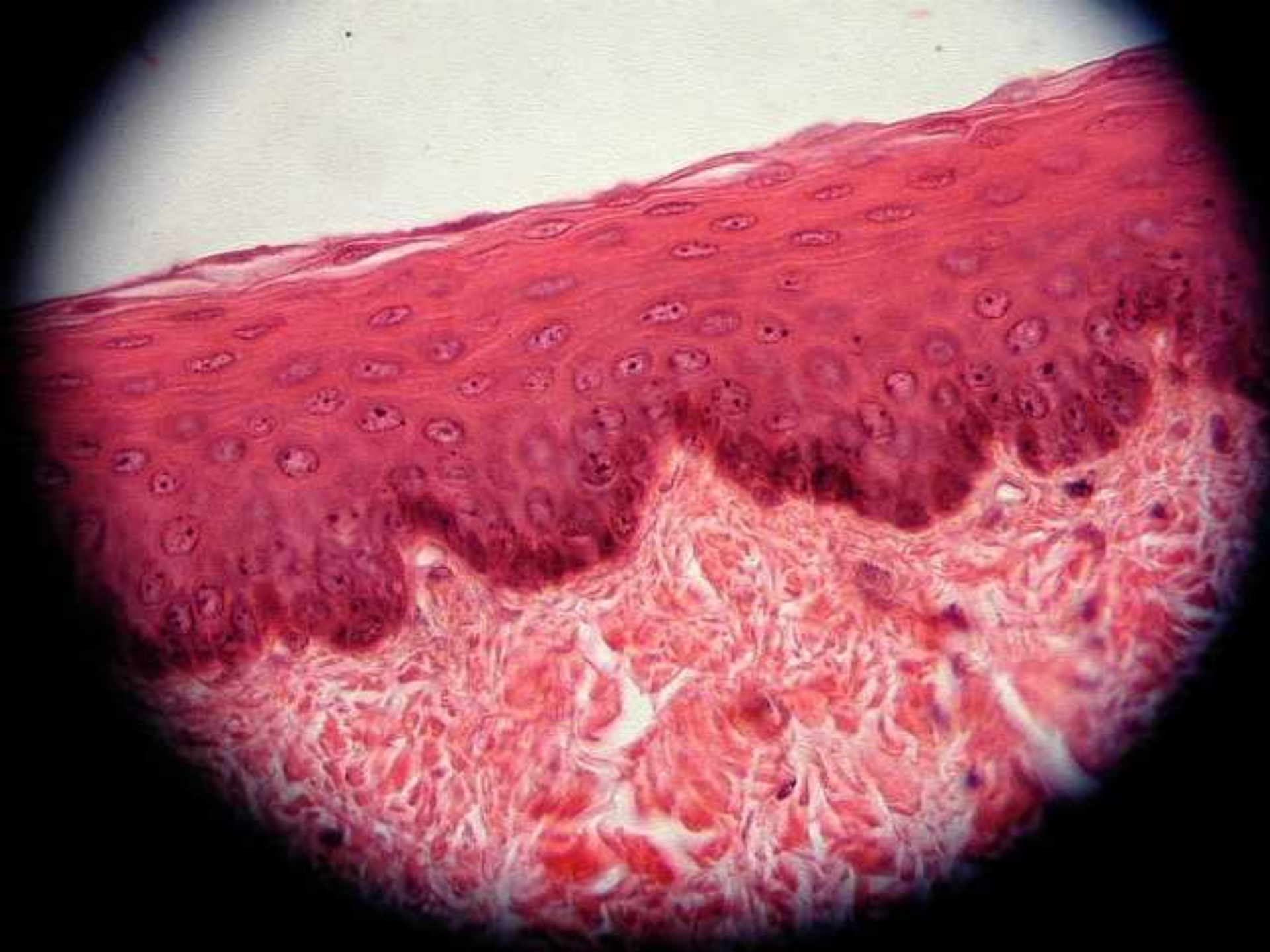


stratified squamous epithelium
(keratinized)



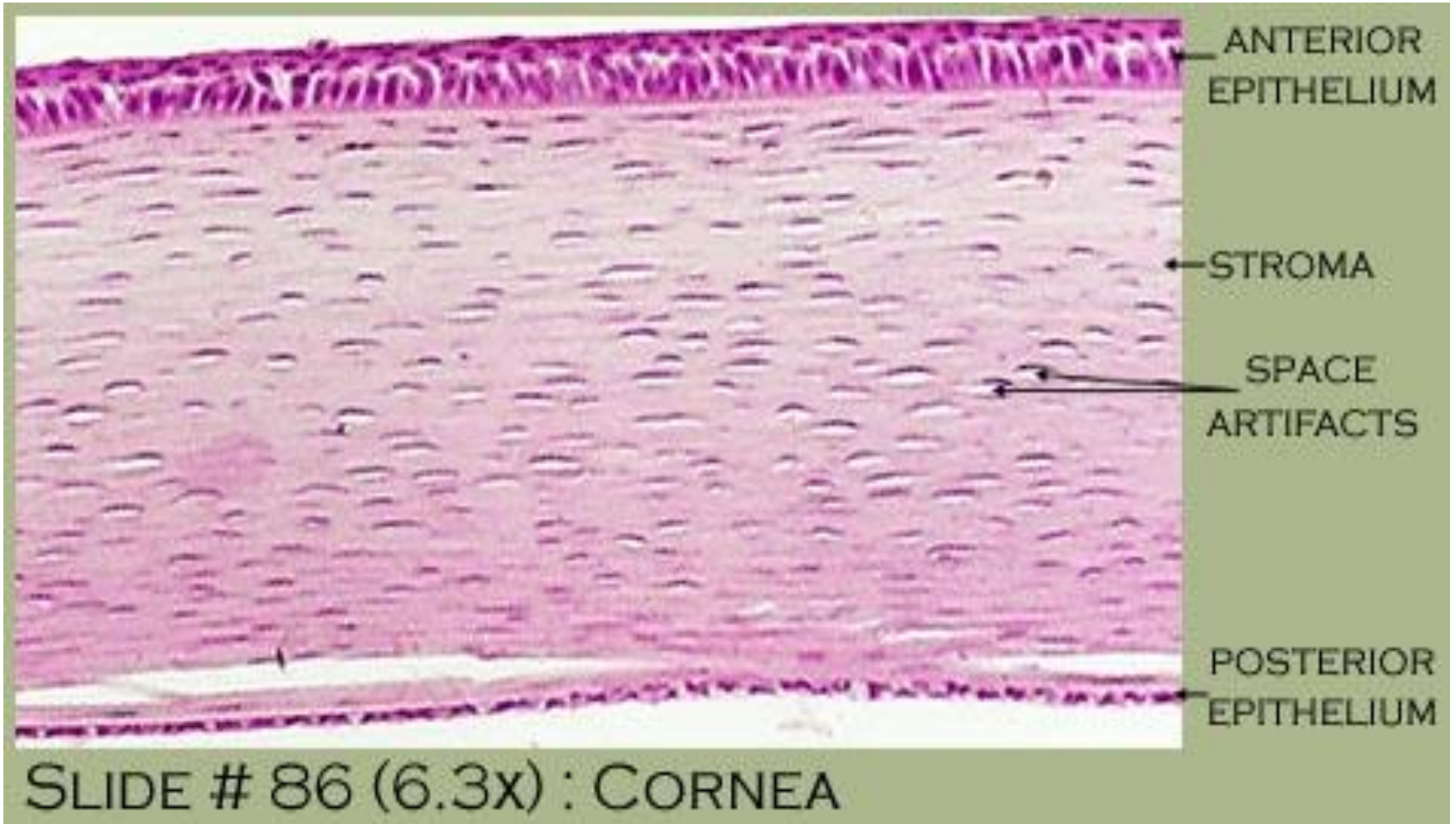
Stratified Squamous Epithelium
with Keratin
Thick skin. Osmium staining



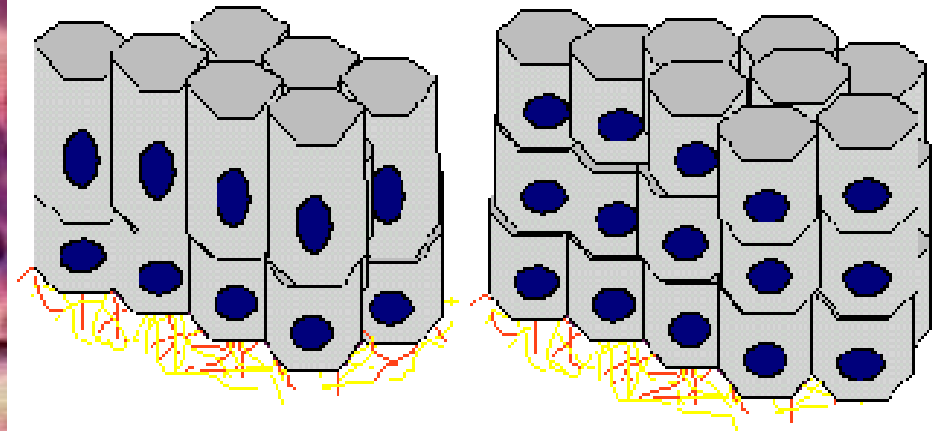
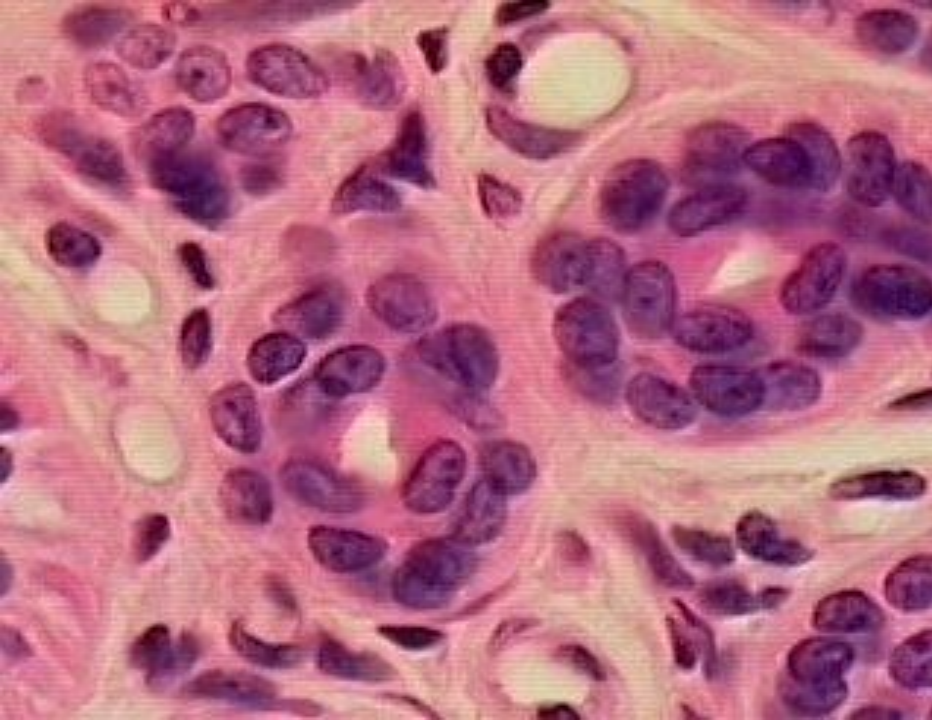


Çok katlı yassı nonkeratinize

- Mikroskobik papilla yok



Çok katlı kübik (ter ve meme bezlerinin kanallarında) ve çok katlı prizmatik epitel



Stratified Columnar

Stratified Cuboidal

Slide 47 Submaxillary gland

Stratified columnar epithelium



Çok katlı deęişken (tranzisyonel) epitel

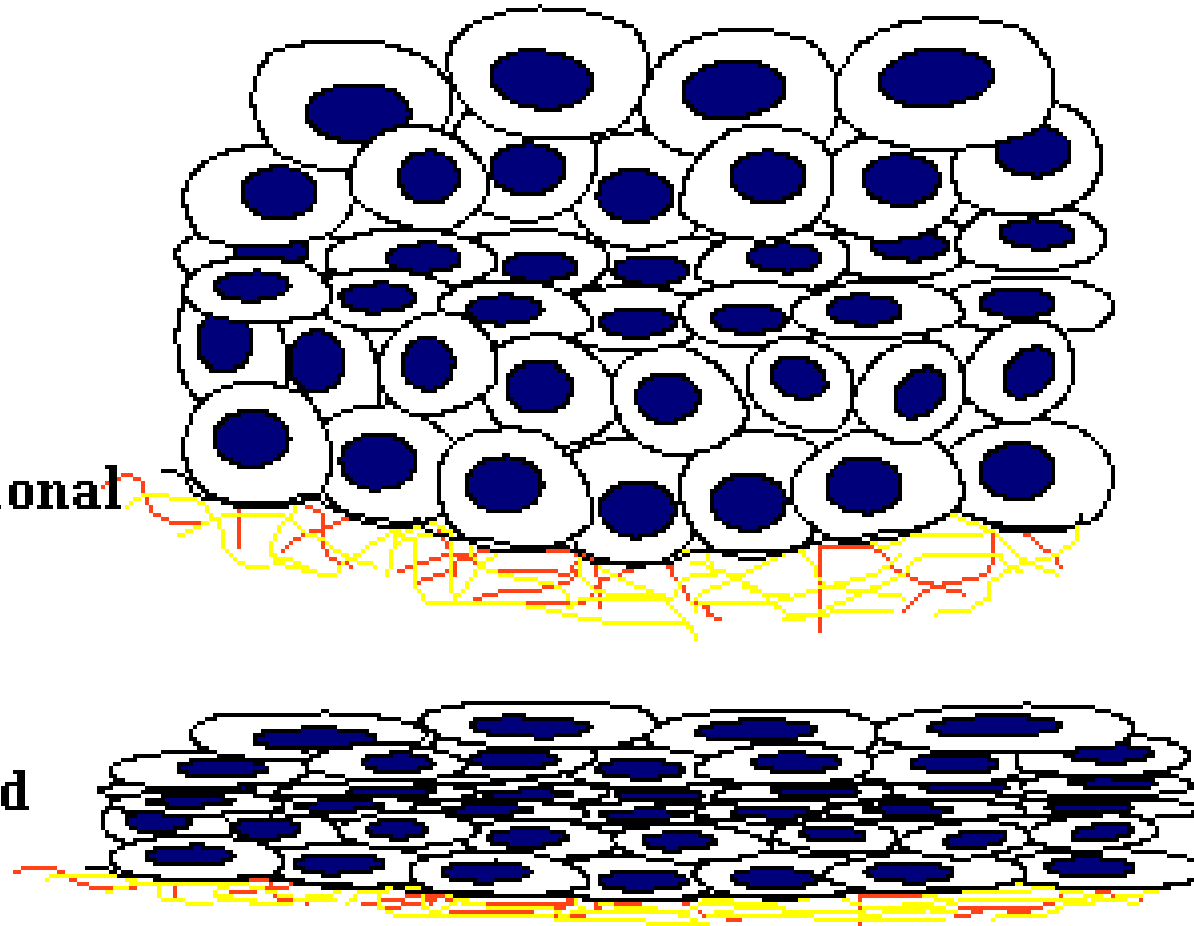
Bosken prizmatik. Dolu iken vassı-kubik

large, ovoid surface cells

normal

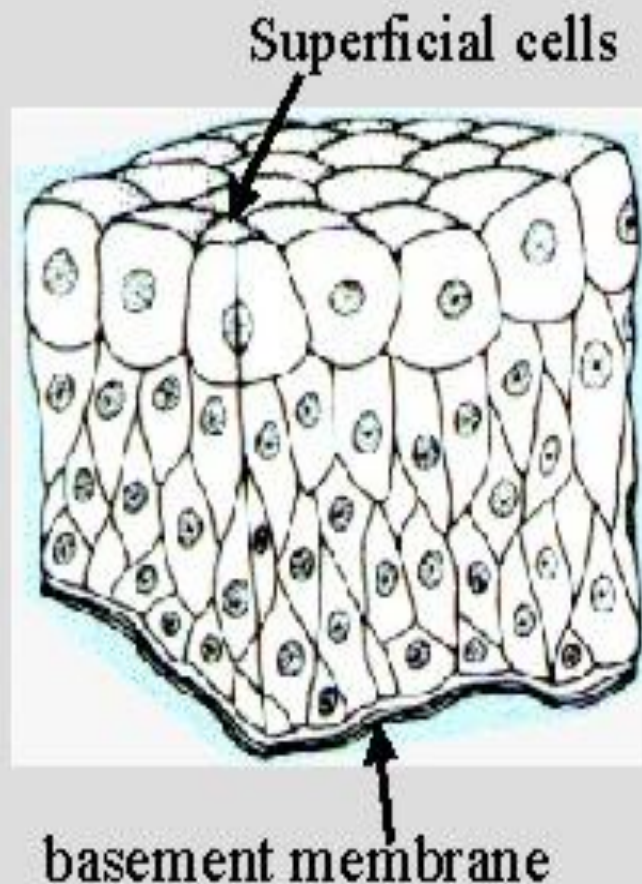
transitional

stretched



Transitional Epithelium

Transitional epithelium lines the urinary tract where it provides stretchability, important in allowing expansion as urine fills the bladder, and in avoiding back pressure during urination.



In the non-distended state the epithelium is four or five cells deep. Stretched, the superficial cells become squamous and the epithelium is reduced to about three cells deep.

Transitional Epithelium in the Urinary Tract

Wall of the urinary bladder

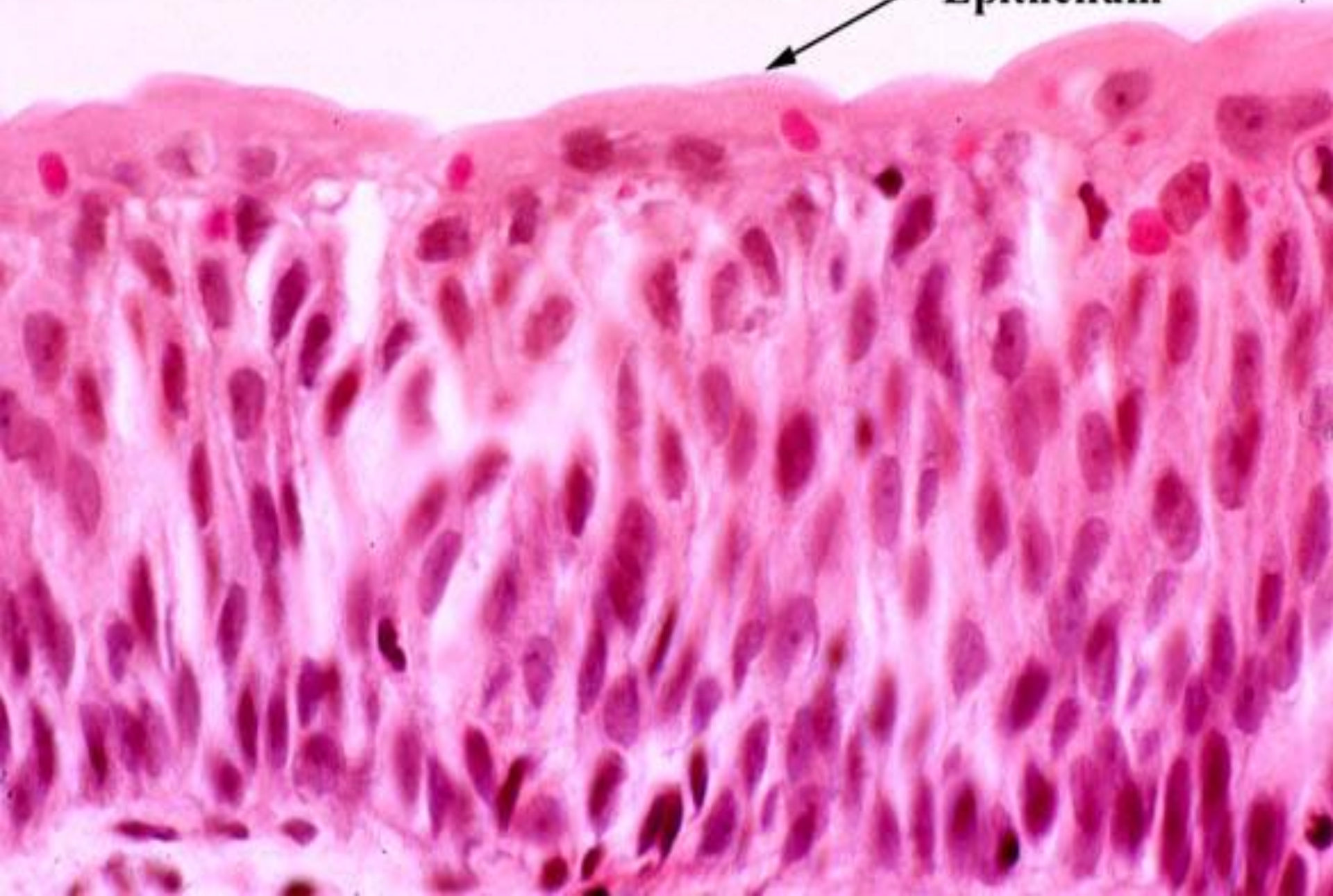


basement membrane

Non-distended transitional epithelium. Distension reduces the number of cell layers.

Transitional epithelium lines the renal calyces, the ureters, the urinary bladder, and a portion of the urethra.

**Transitional
Epithelium**

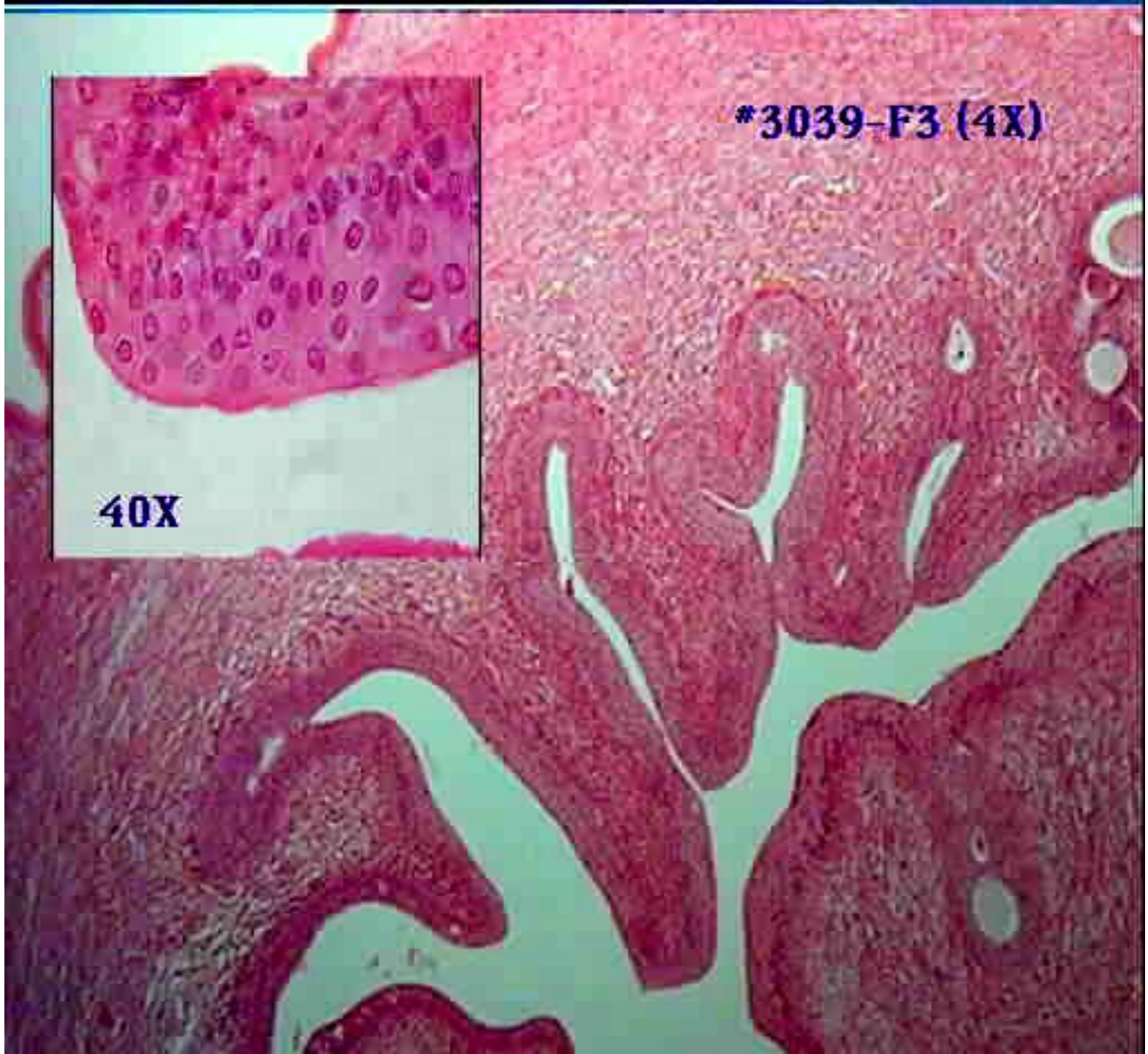




#3039-F3 (4X)



40X

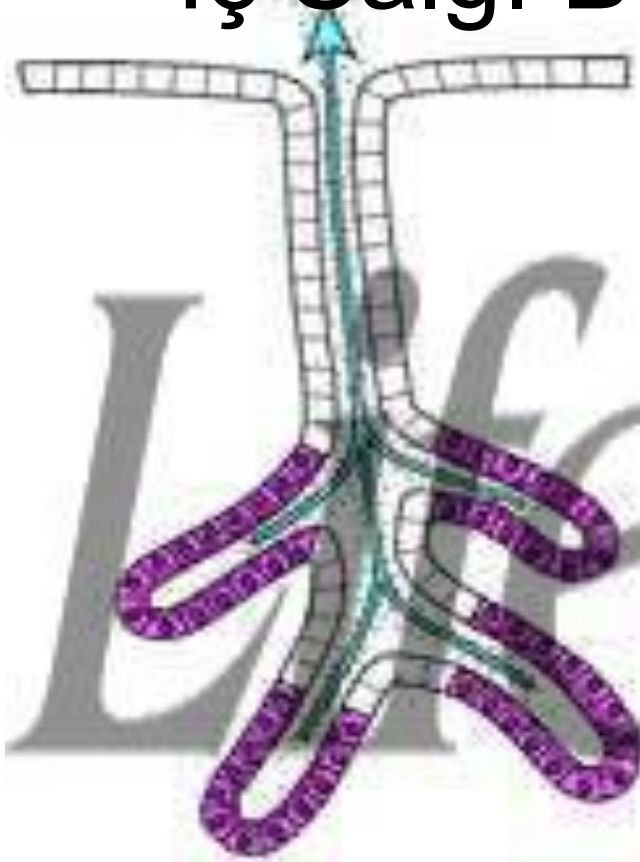




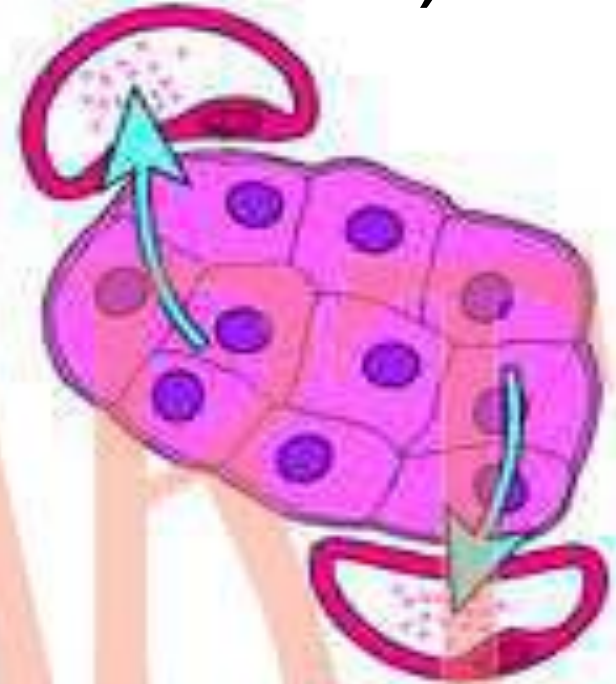
2-SALGI EPİTELI

- Sekresyon: Madde sentezi (hücre içinde).
- Salgı (Sekret): Sentezlenen madde.
- Salgilama (Ekstruzyon): Salgılanan maddenin hücrenin dışına verilmesi.
- Bez (Glandula): Salgı epitel hücrelerinin yaptığı topluluk.

Dış salgı bezleri (Ekzokrin) İç Salgı Bezleri (Endokrin)

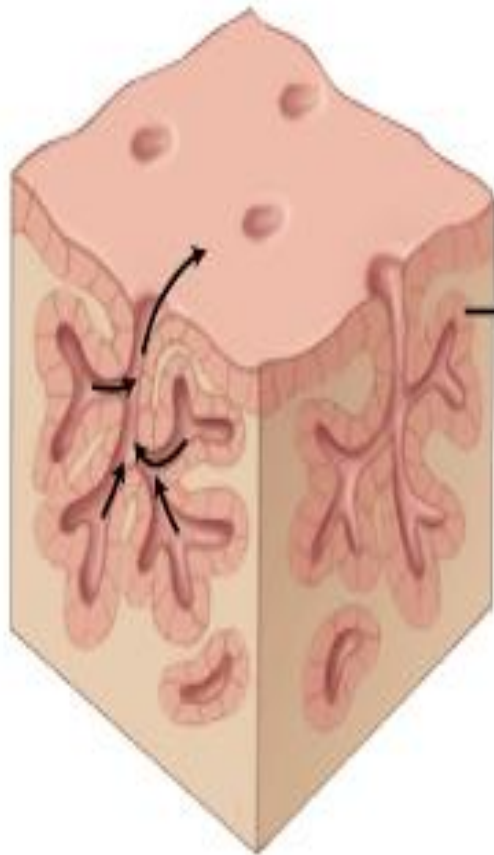


Exocrine Gland: Secretes Substance onto a Surface, Usually Through a Duct



Endocrine Gland: Secretes Substance Into the Bloodstream

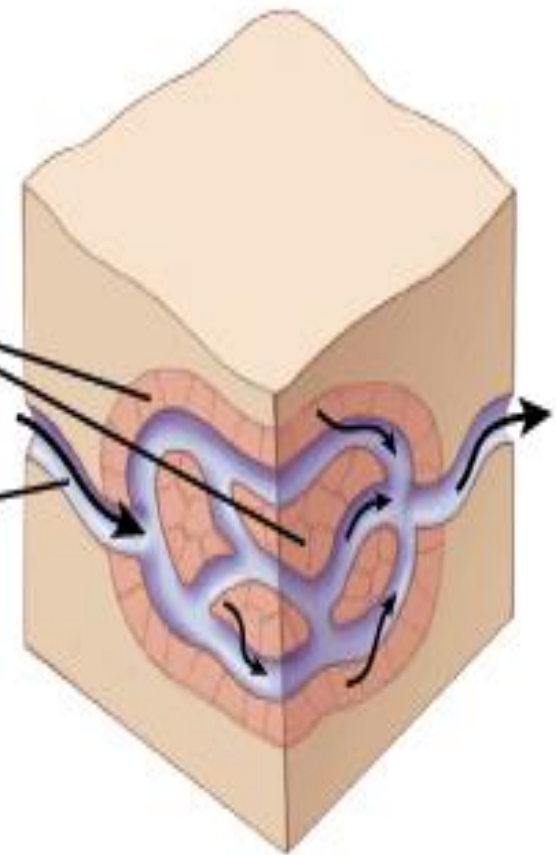
Exocrine gland



Endocrine gland

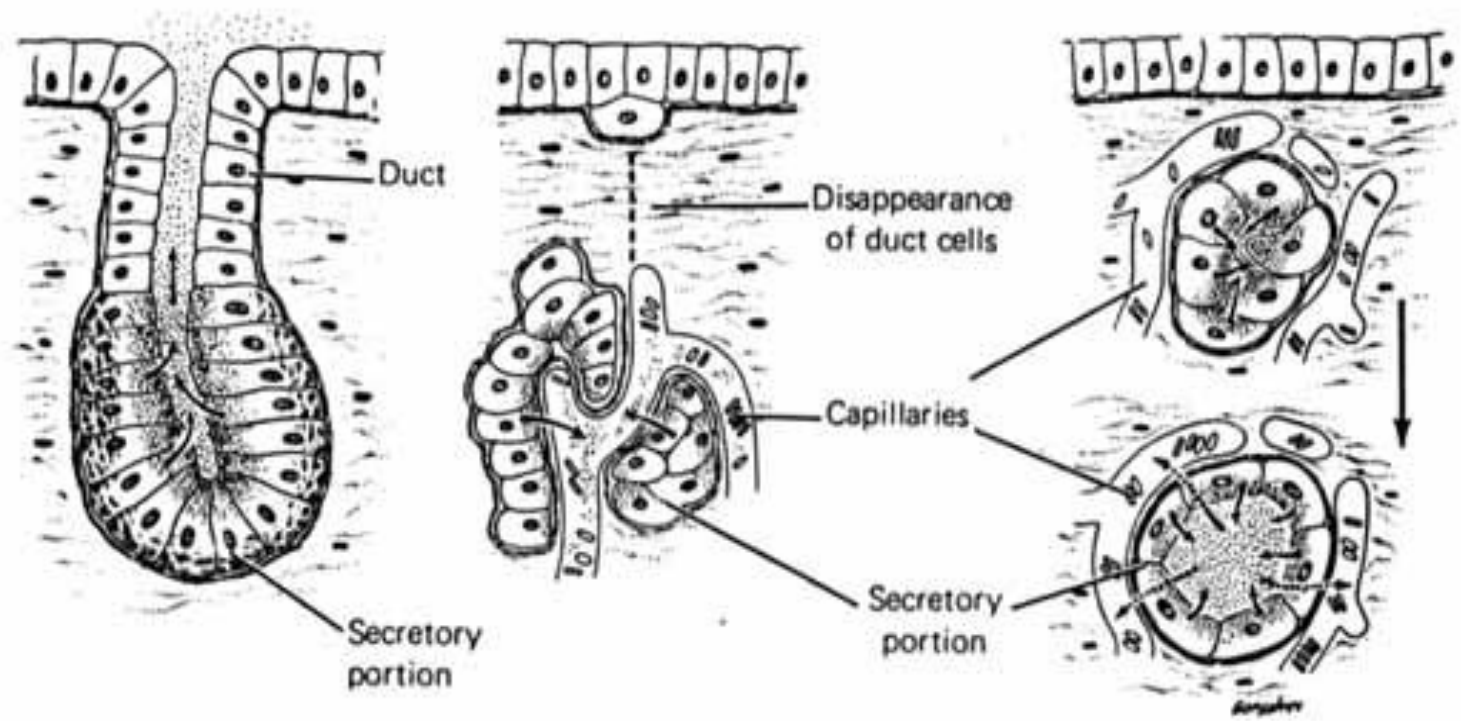
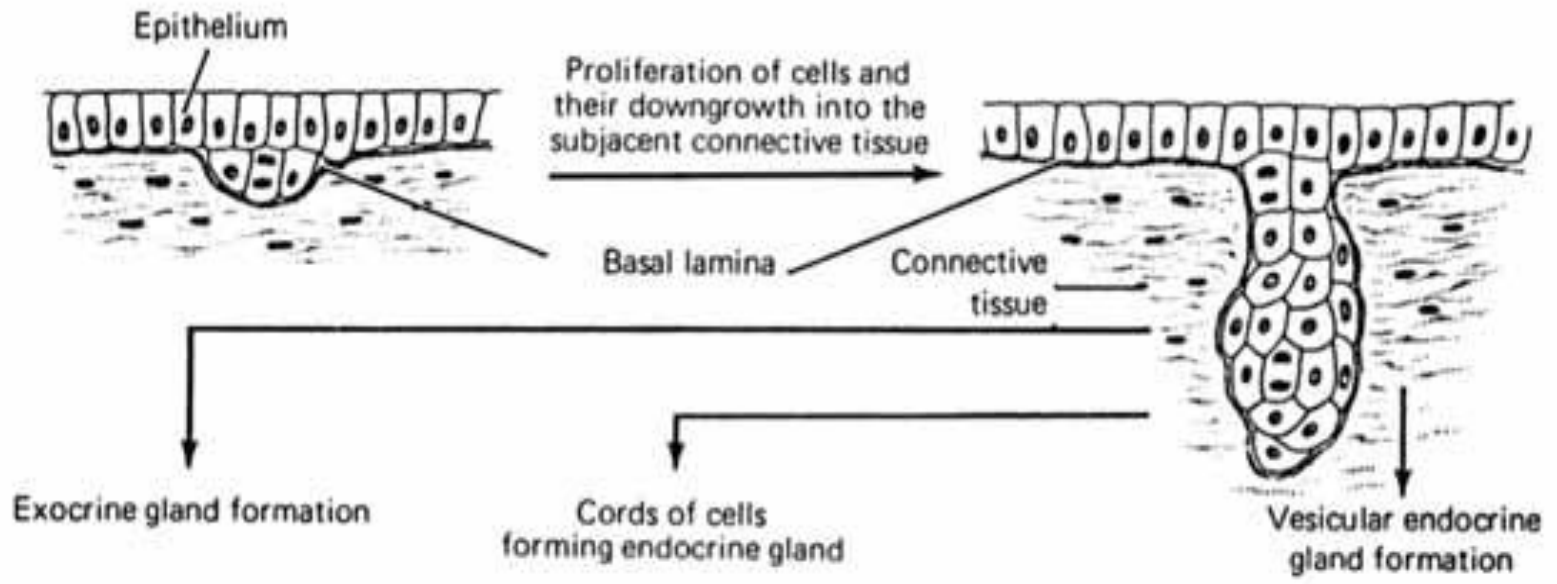
Gland cells

Blood flow



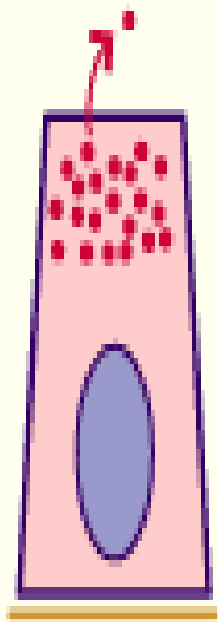
(b) Glandular epithelia secrete a product

- **Ekzokrin bezlerde** pramit şekilli salgı epitel hücreleri bir araya gelip bir lumen etrafında yerleşerek corpus glandule yaparlar.
 - Bazal yüzden madde alıp, apikal yüzden salgı.
 - C. glandule sayısı azsa mikroskobik bez (dudak, yanak, dil)
 - C. glandule sayısı fazlaysa makroskobik (anatomik) bez (gl. mandibularis, gl. parotis vb).
- **Endokrin bezlerde** ise (troid hariç) corpus glandule oluşturmazlar, kordonlar yaparlar.
 - Aralarında da kapillar damarlar.
 - Damarlara bakan yüzlerinden hem madde alış verişi, hem de salgının işletilmesi.



Bez epitel hücreleri yaptıkları salgıyı 3 şekilde dışarı verirler

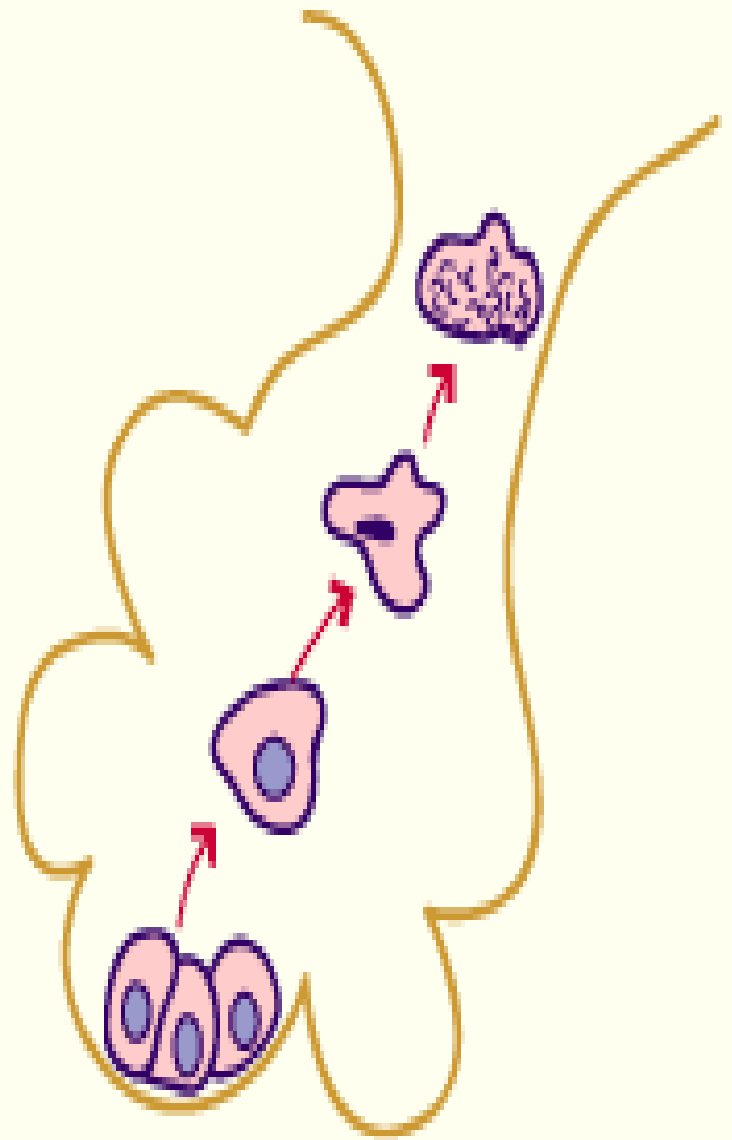
- 1. Merokrin (Ekrin) salgılama
 - Endokrin bezlerin tümü, ekzokrin bezlerin çoğu
- 2. Apokrin Salgılama
 - - meme bezleri, insan maymun dışında ter bezleri, anus civarındaki bezler.
- 3. Holokrin salgılama
 - Deride yağ bezleri
 - Sitojenik bezler (Testis ve Ovaryum): Holokrin tipte ve hücre salgılayan bezler.



A



B

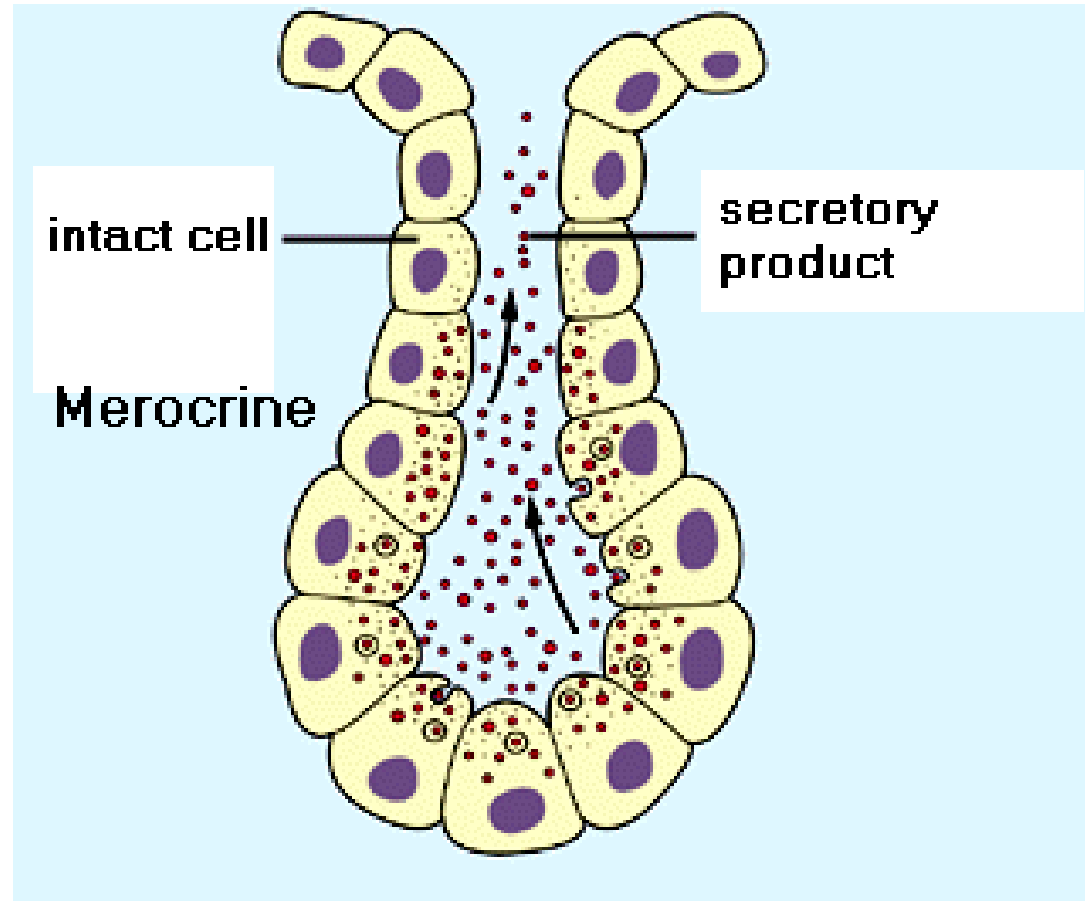


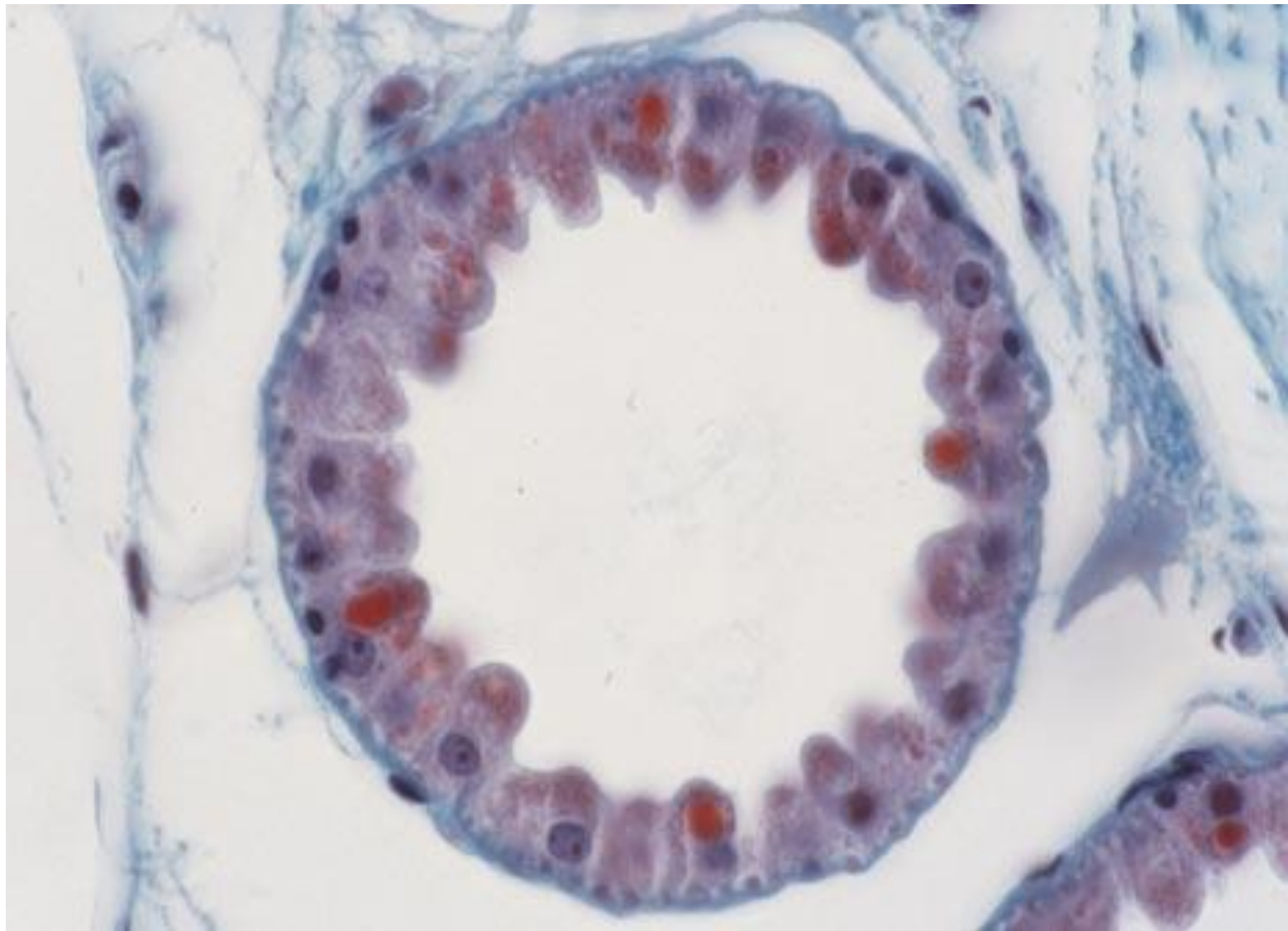
C

1. Merokrin (Ekrin) salgılama

- Salgı granülü h içinde eriyip difuzyonla

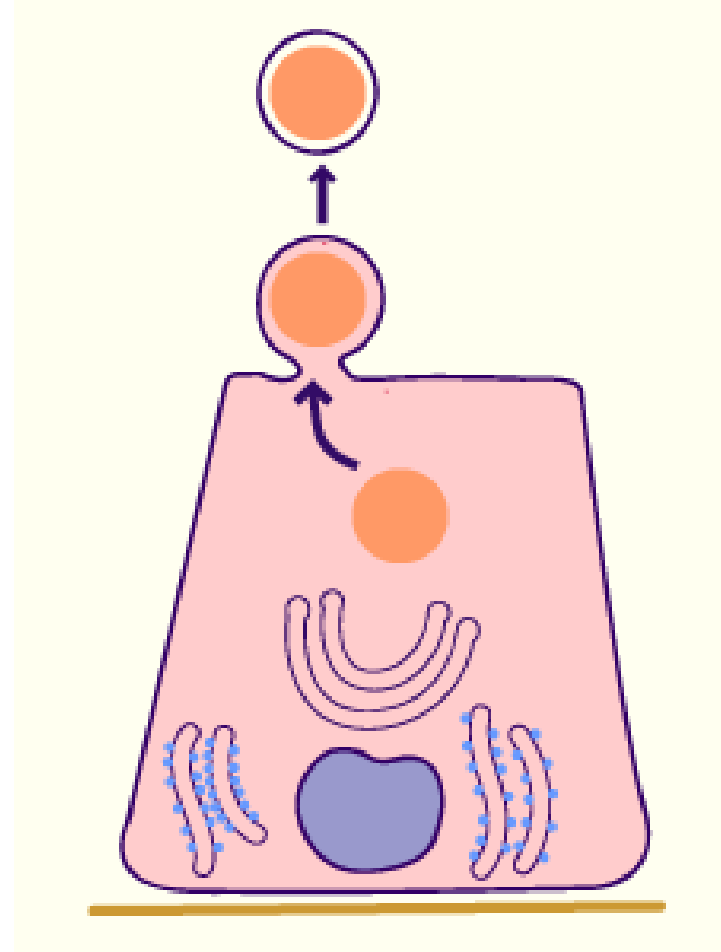
- Ekzositozla

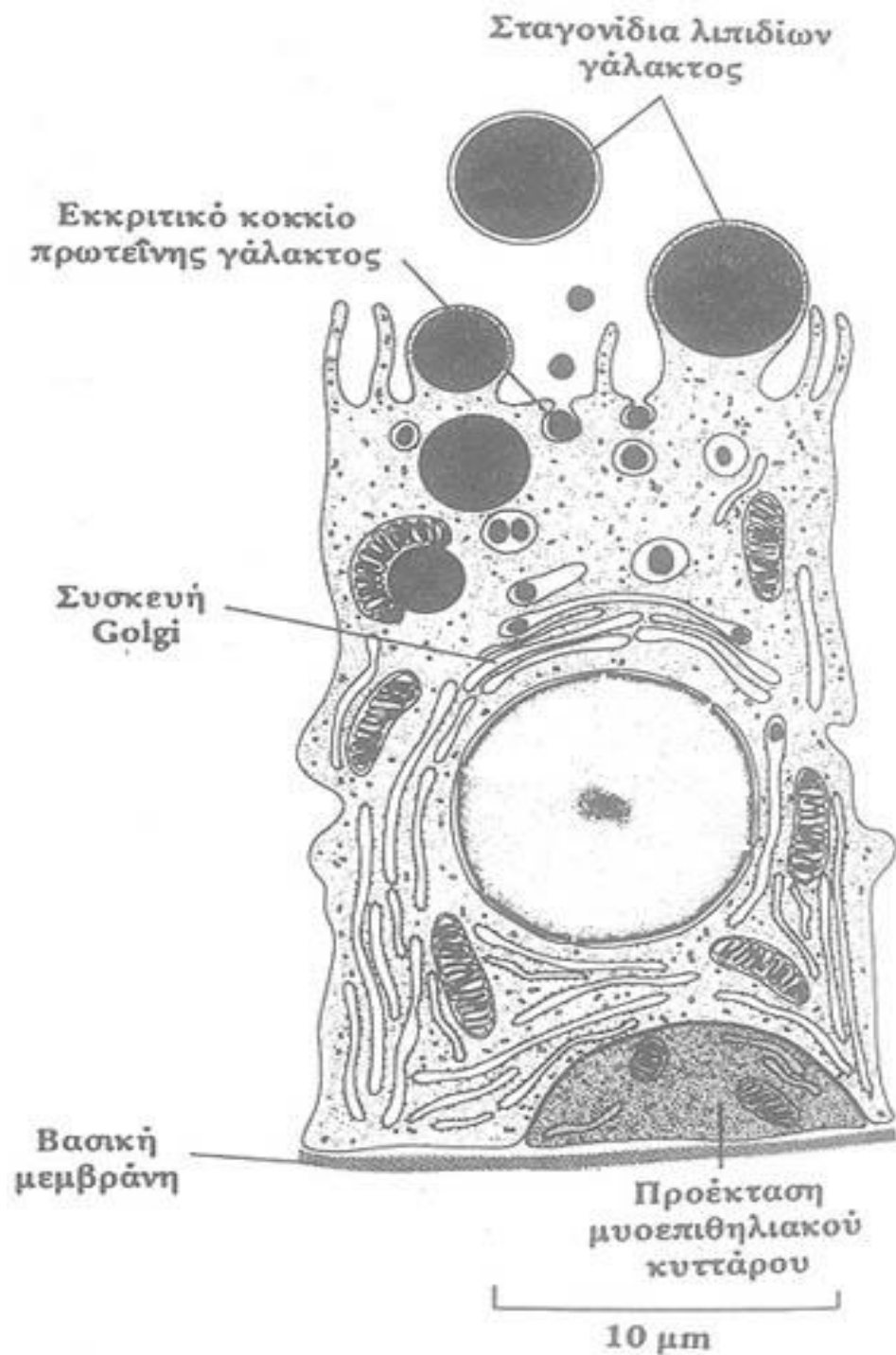




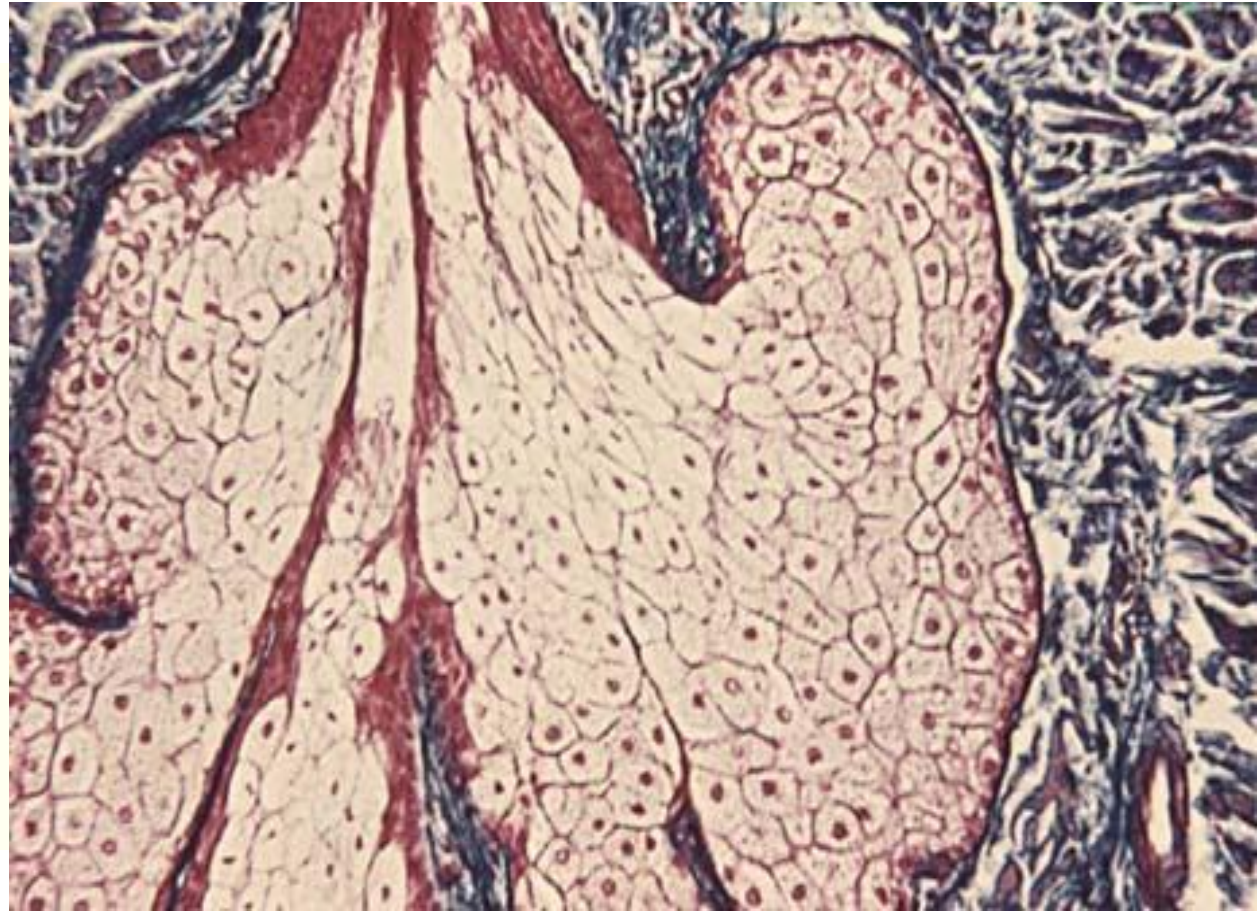
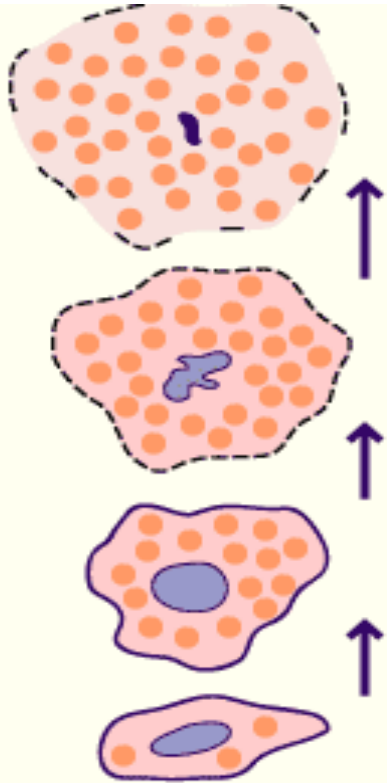
2. Apokrin salgılama

- Salgı maddesi apikal sitoplazmada toplanır
- Sitoplazma boğumlanarak sitop. kaybı.





Holokrin salgılama



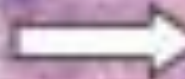
Dış Salgı Bezleri

Core of
a villus

Epithelium

Goblet
cell

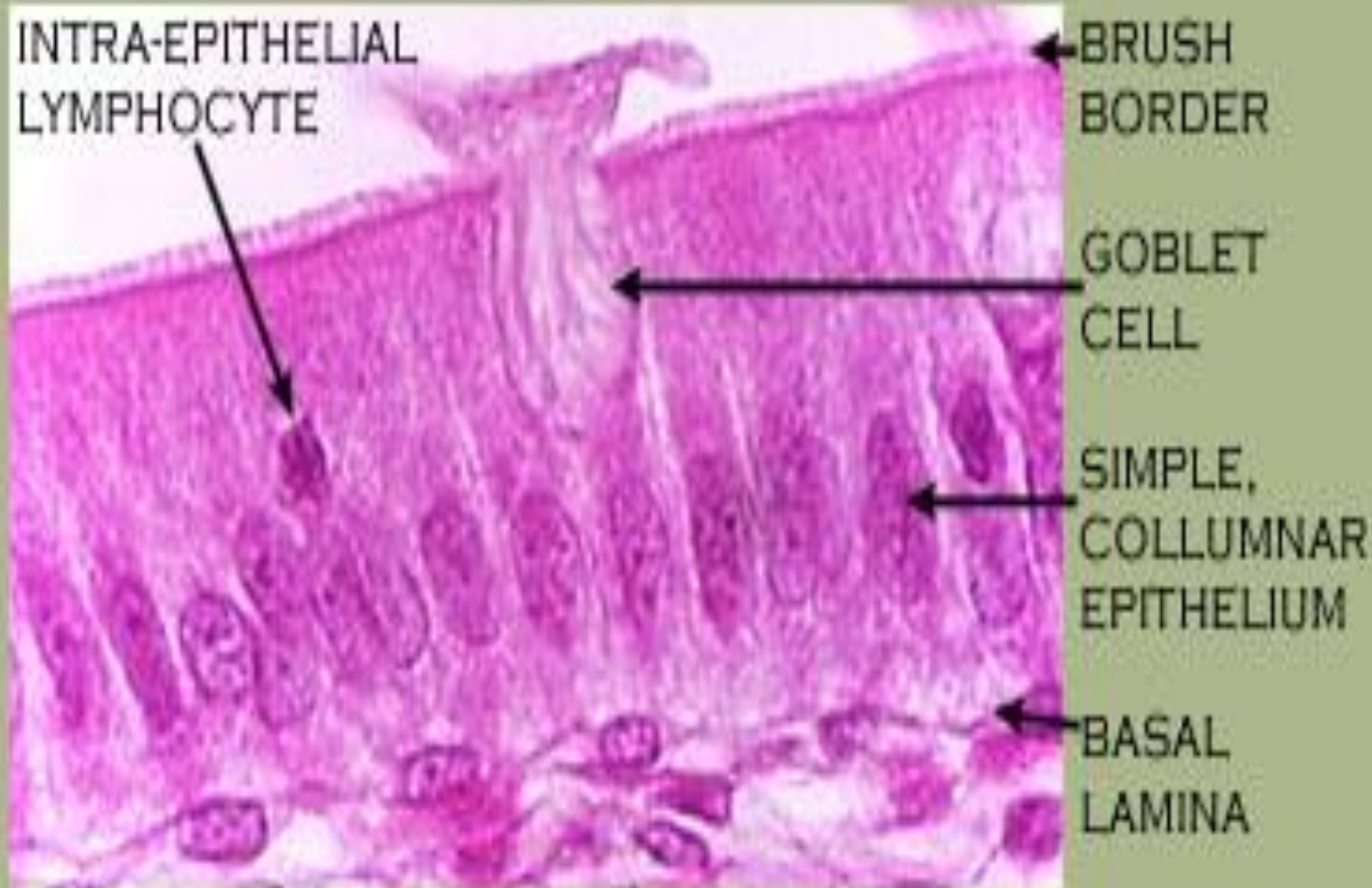
Brush
border



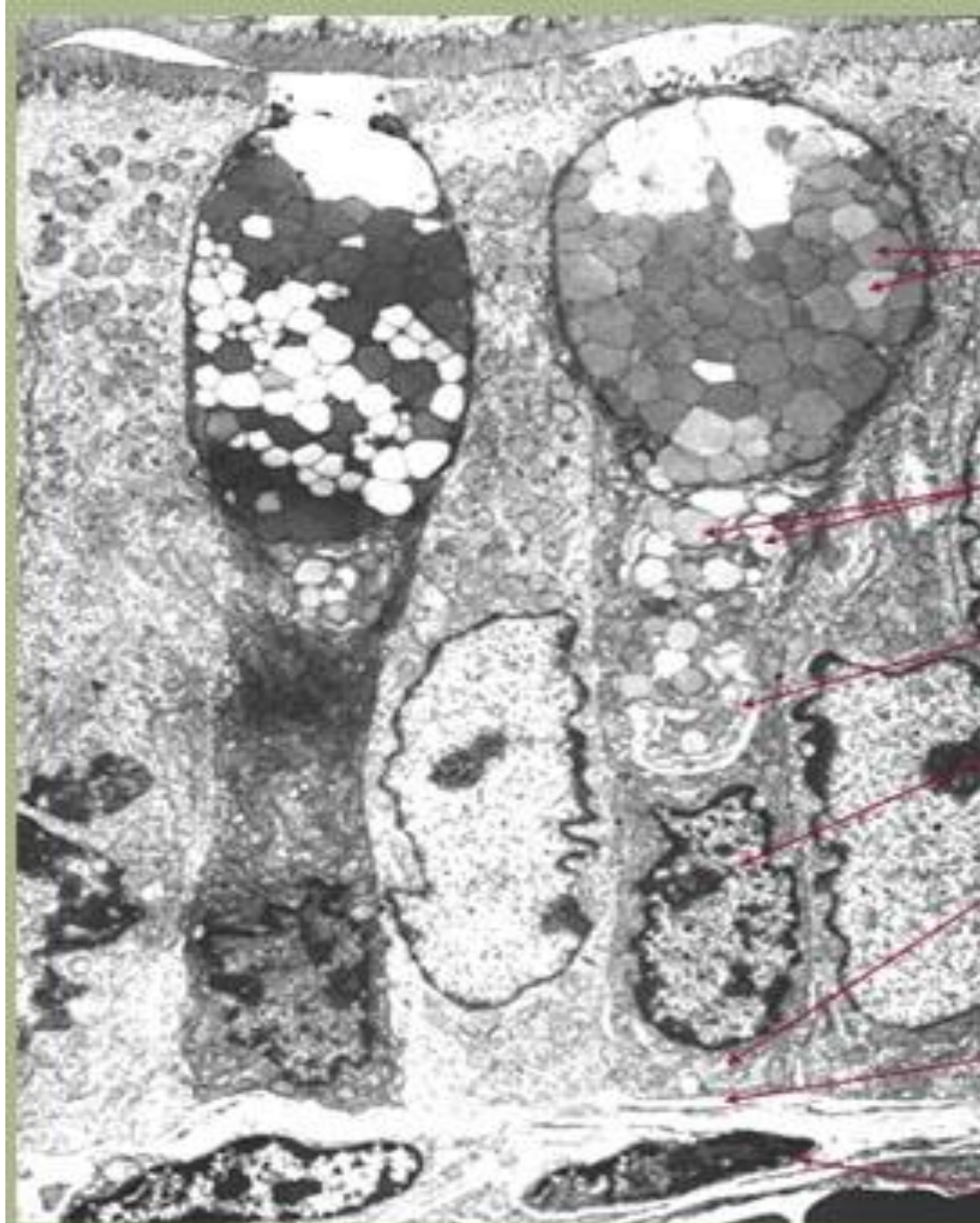
1-ünicellüler – intraepithelial bez
Kadeh hücresi en basit tipi







SLIDE # 146 : INTESTINE



MATURE
SECRETORY
VESSICLES

TRANSFER
(IMMATURE)
VESSICLES

GOLGI
APPARATUS

NUCLEUS

ROUGH
ENDOPLASMIC
RETICULUM

BASAL
LAMINA

FIBROBLAST
IN COLLAGEN

TEM : GOBLET CELL OF DUODENUM

2-Multicellüler (ekzoepitelyal) bezler

Birden fazla hücreden oluşmuş.

- 1.Boşaltıcı kanallarının dallanma durumuna göre
 - a. Basit Bezler
 - b. Bileşik bezler
2. Corpus glandulelerinin şekline göre
 - a. Tubuler bezler
 - b. Alveoler (asiner) bezler
 - c. Tubulo-alveoler bezler
3. Corpus glandulelerin yaptığı salgının türüne göre.
 - a. Seröz bezler
 - b. Müköz bezler
 - c. Serö-müköz (mikst) bezler

1-Boşaltıcı kanalların durumuna göre

a.Basit Bezler

Bir ya da birkaç c.glandule.

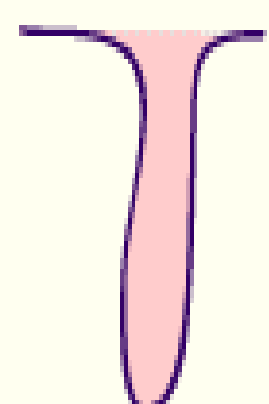
Bütün c.glanduleler tek bir boşaltıcı kanala.

b. Bileşik bezler

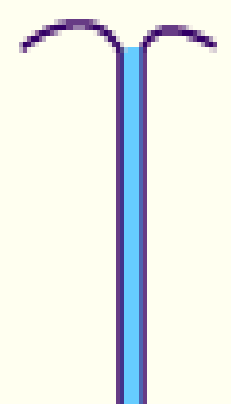
Çok sayıda c. glandule

Ana boşaltıcı kanal.

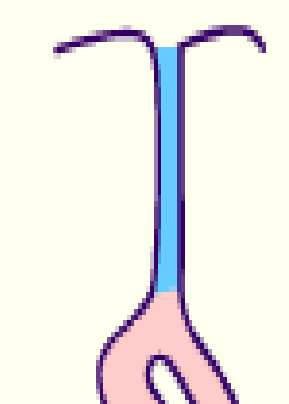
Ductus Ekskretoryus (ana boşaltıcı kanal) -pars eksretorya
-pars sekretorya -pars inisyalis - c. glandule



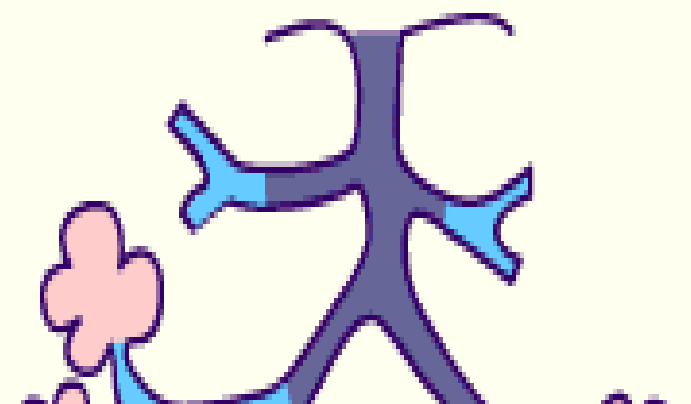
A



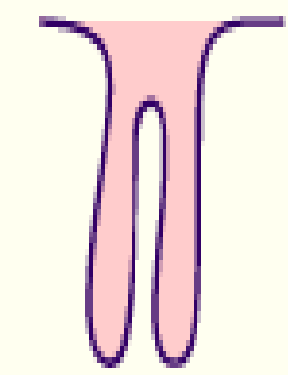
B



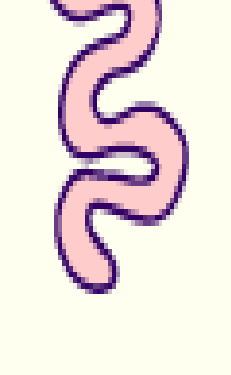
C



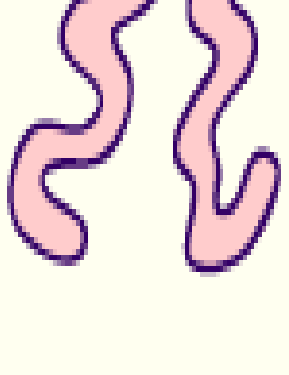
D



E



F

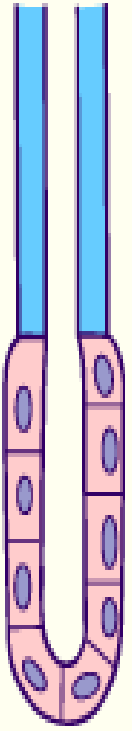


G

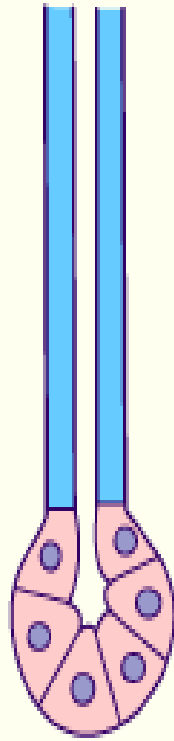


H

I

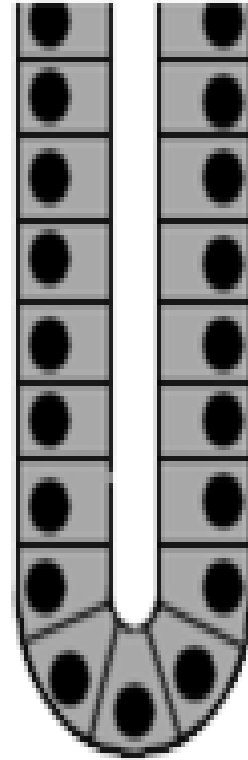


A

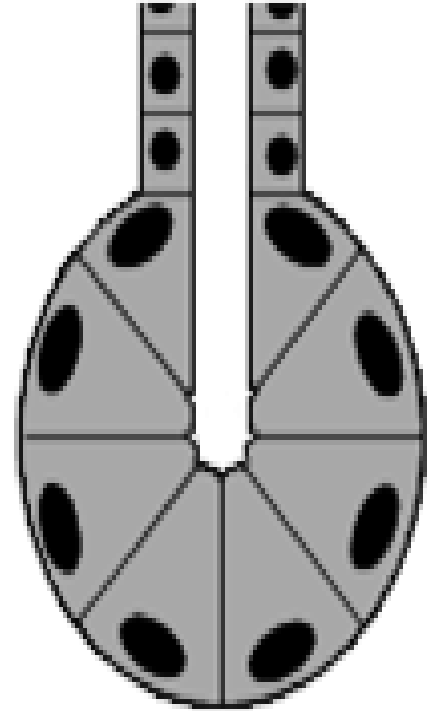


B

tubular

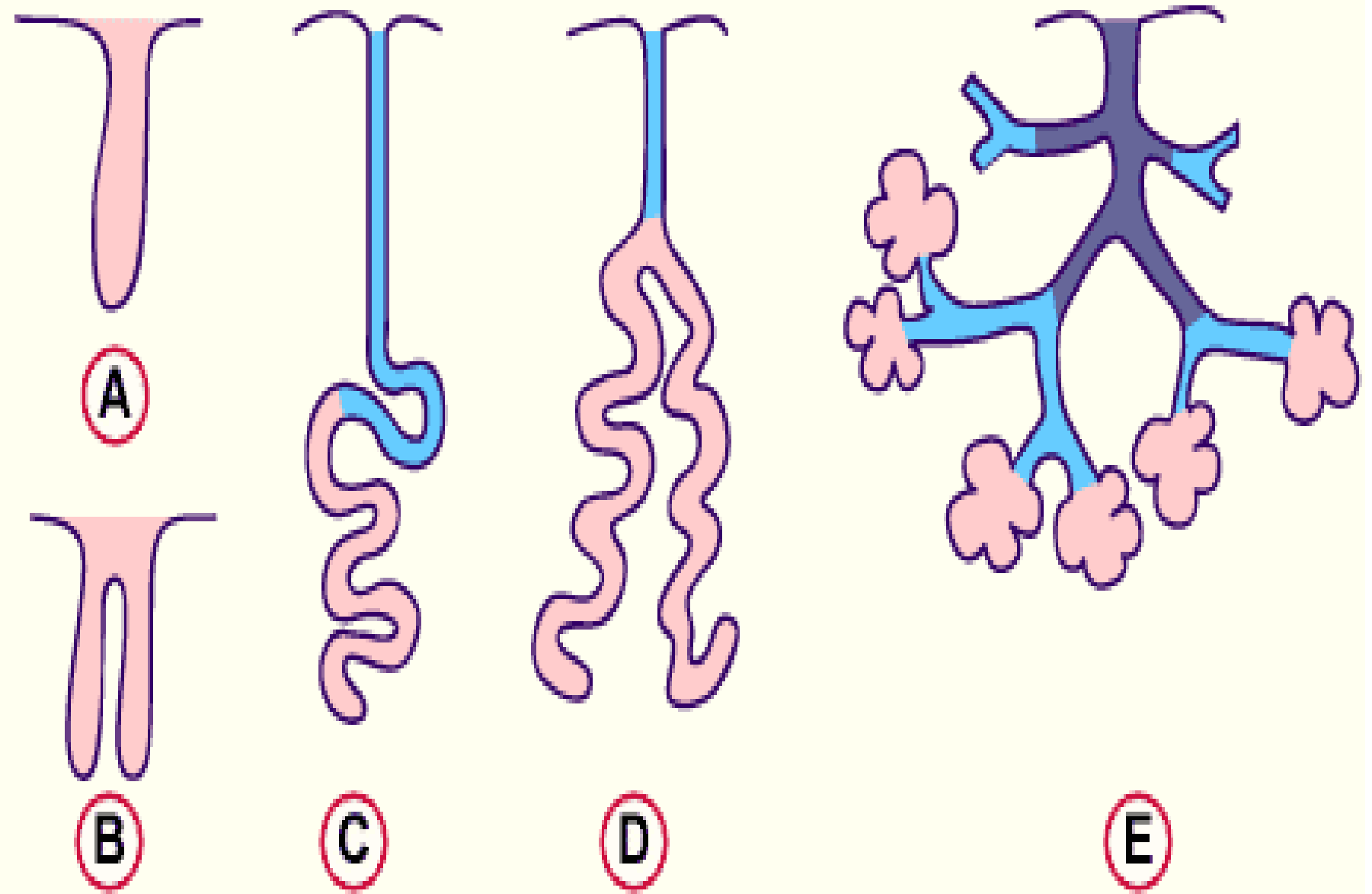


acinar



glands

2-Corpus glandulelerin şekline göre



2-Boşaltıcı kanalların durumuna göre



Simple tubular



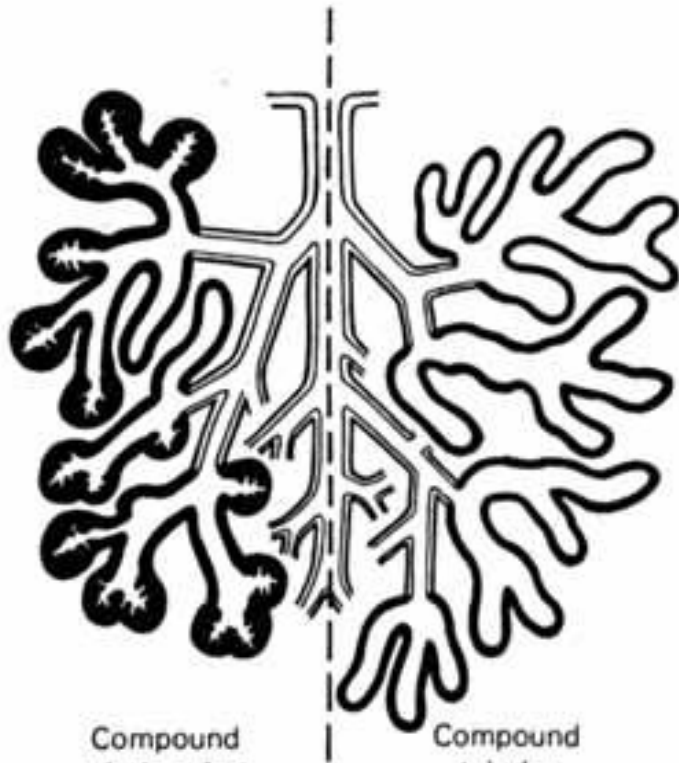
Simple coiled tubular



Simple branched tubular



Simple branched acinar



Compound tubulo-acinar

Compound tubular



Compound acinar



Simple tubular



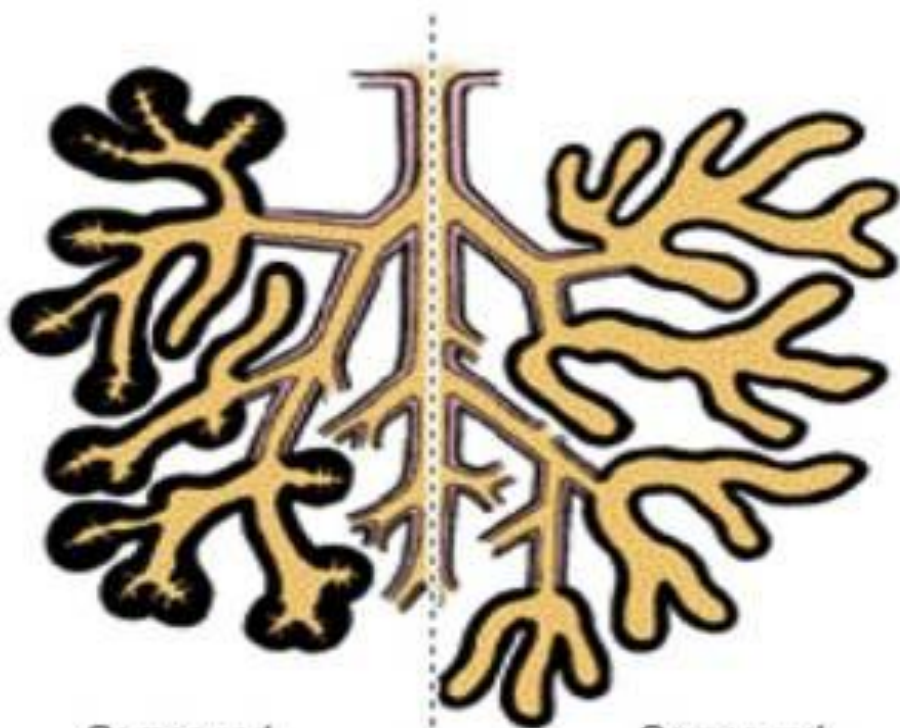
Simple coiled tubular



Simple branched tubular



Simple branched acinar

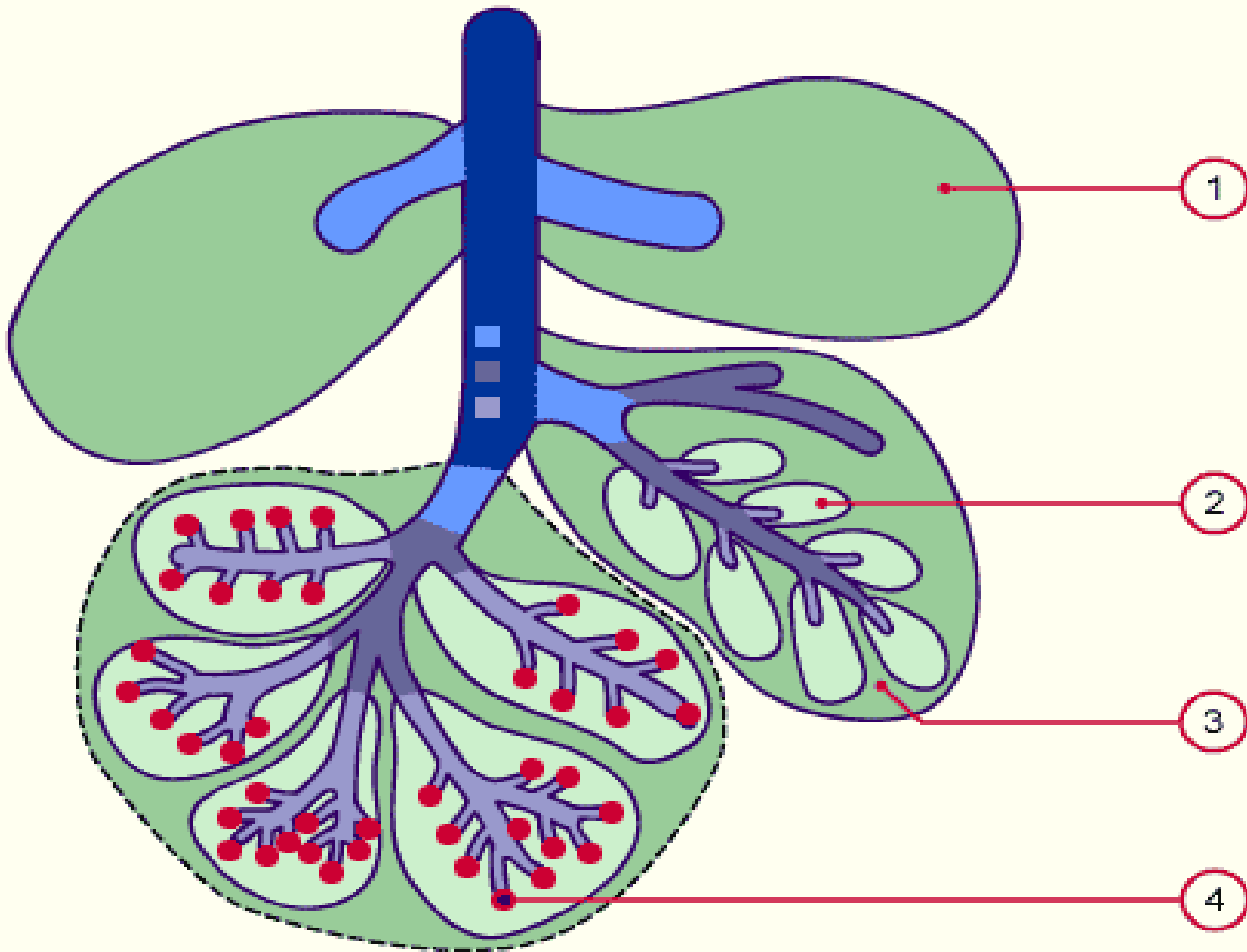


Compound tubuloacinar

Compound tubular



Compound acinar



Composite Exocrine Gland and Ducts

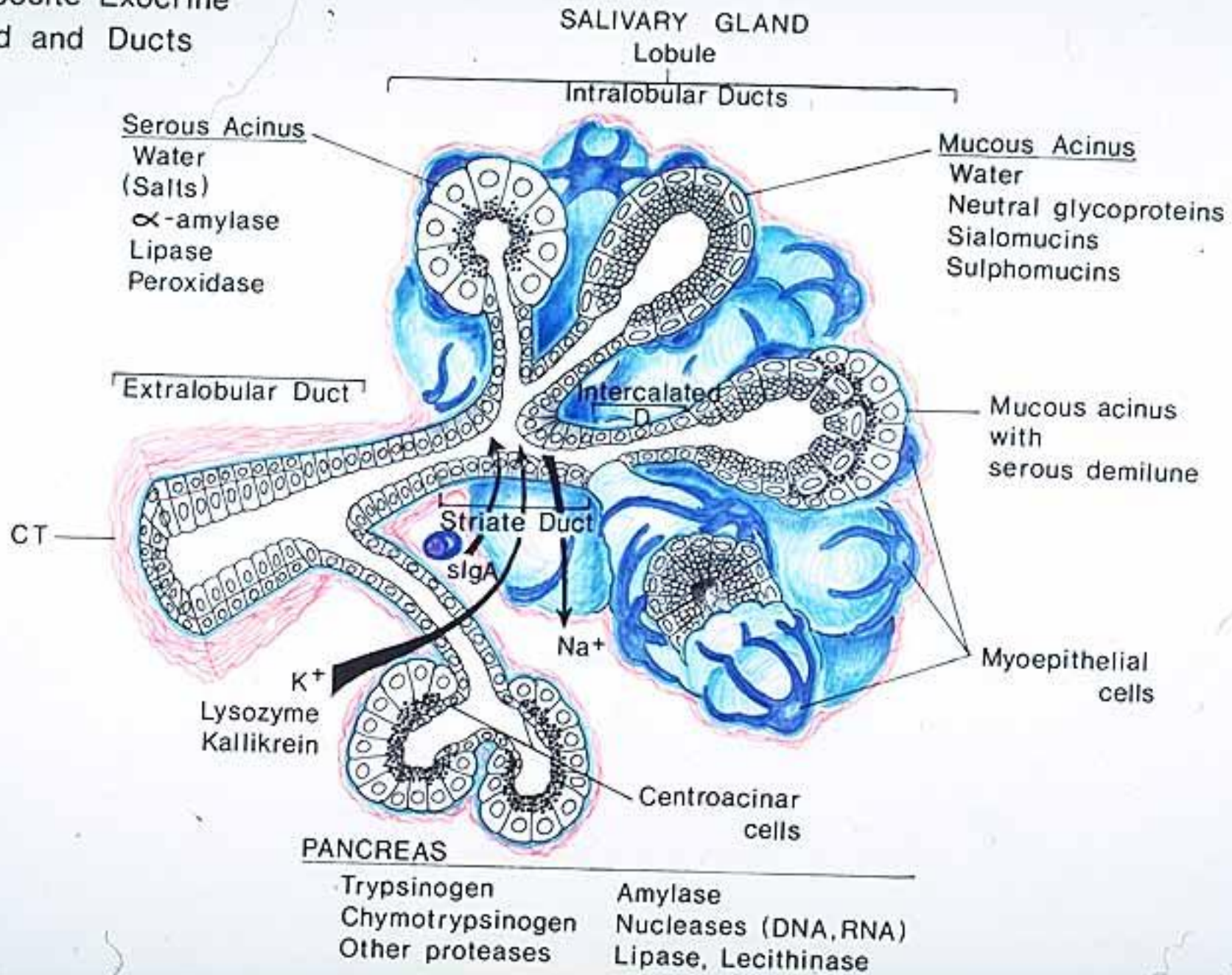
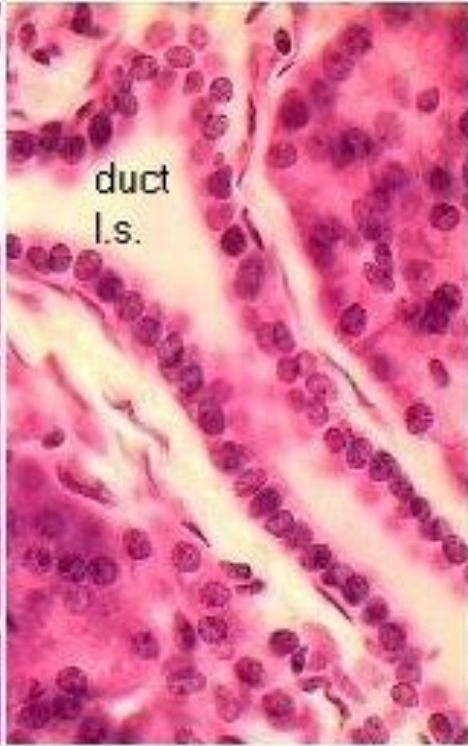
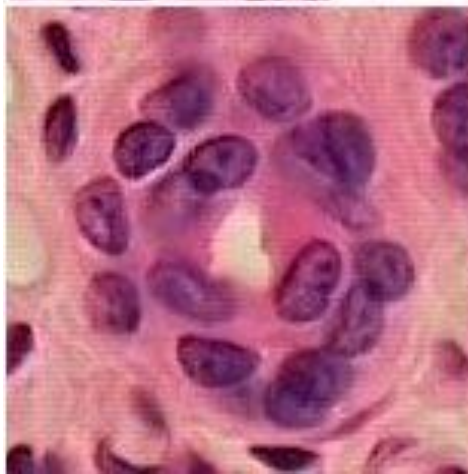
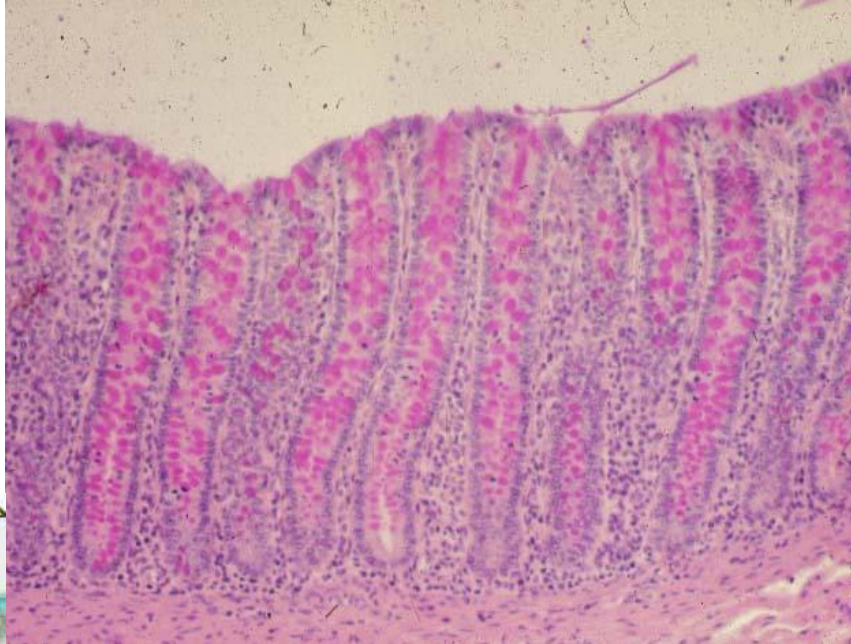
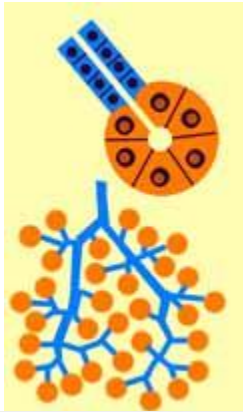


Figure 1. Composite diagram of exocrine glands and ducts that drain them.

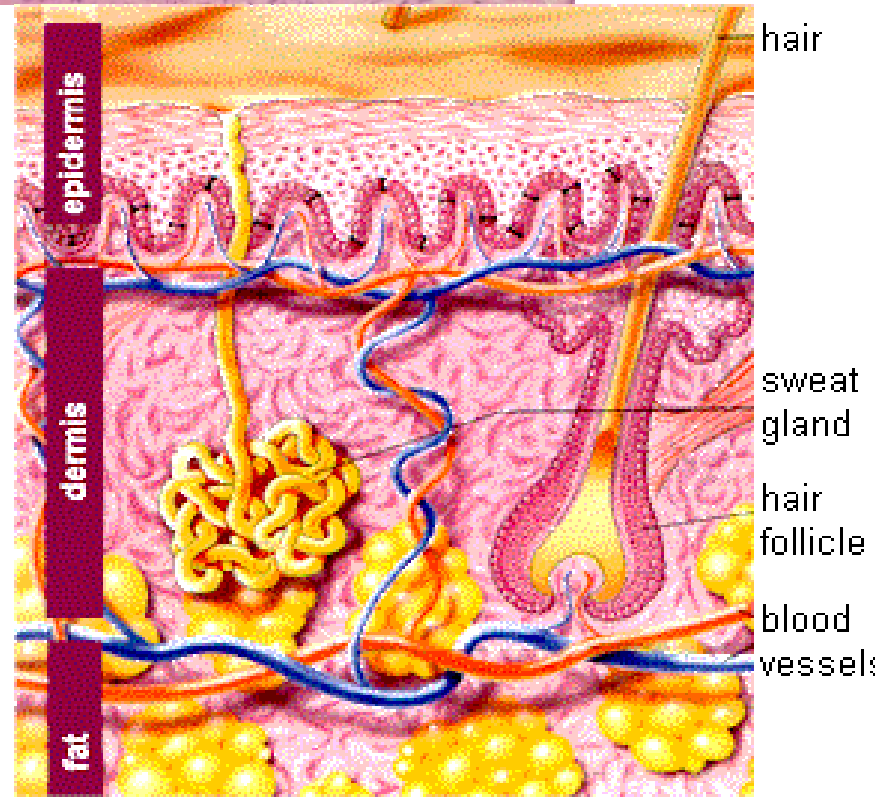
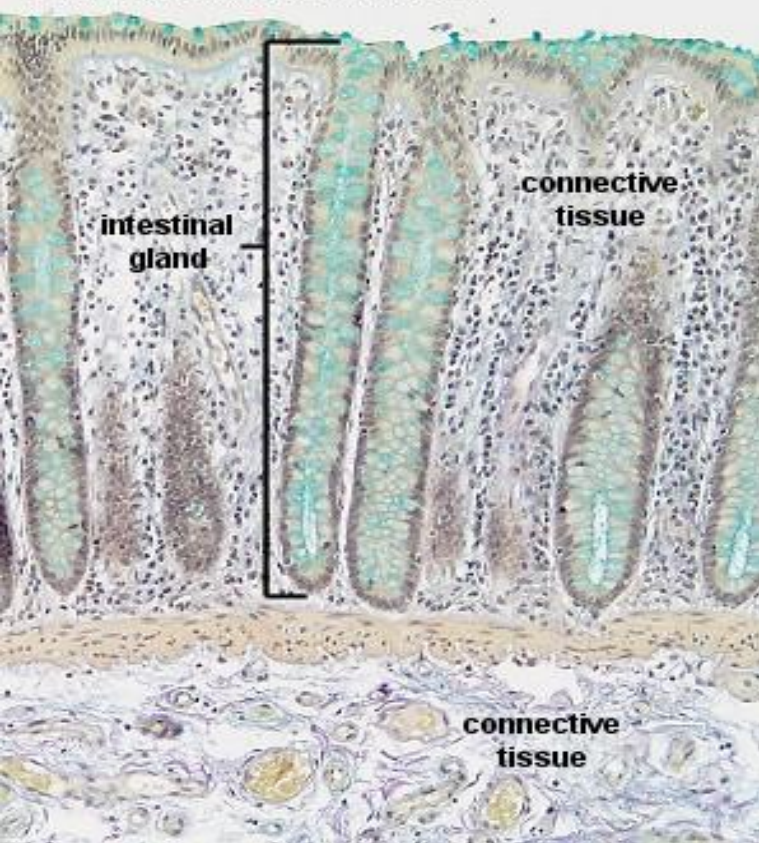


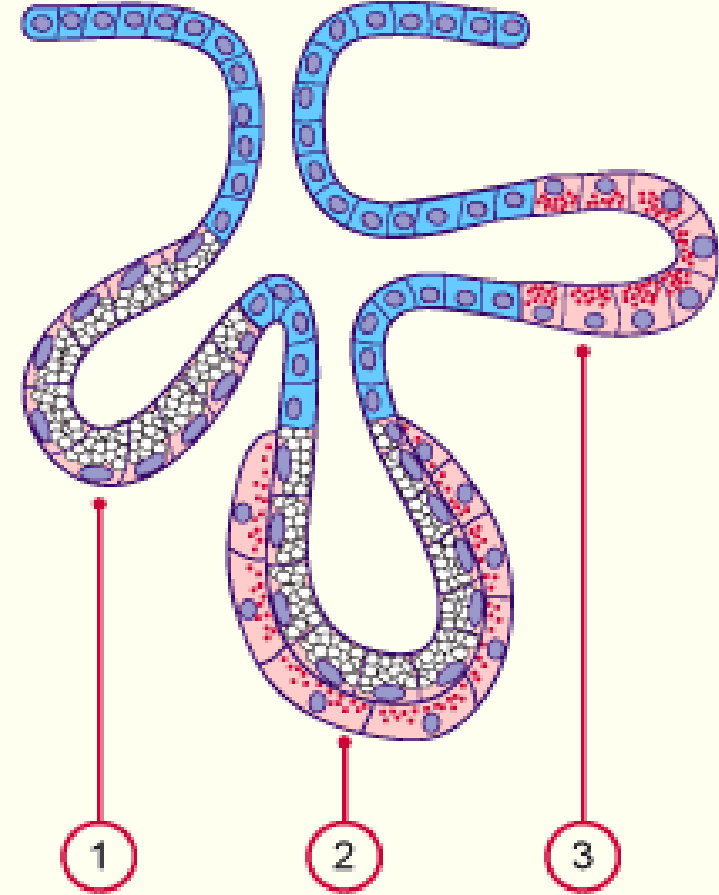
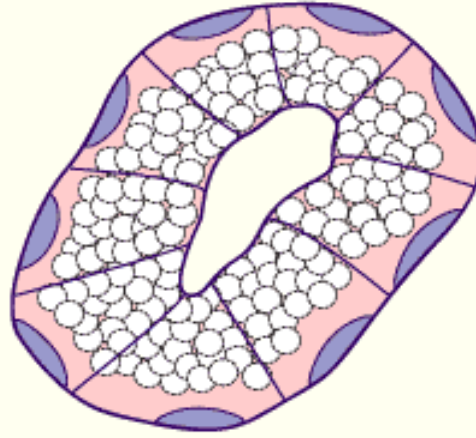
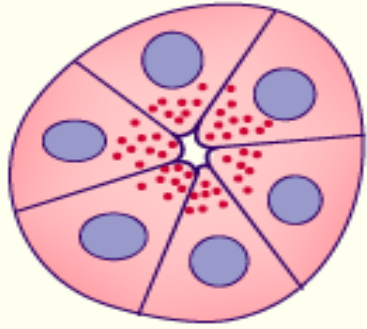
ducts in cross-section all appear as tubular structures with lumens-note different epithelia form these three



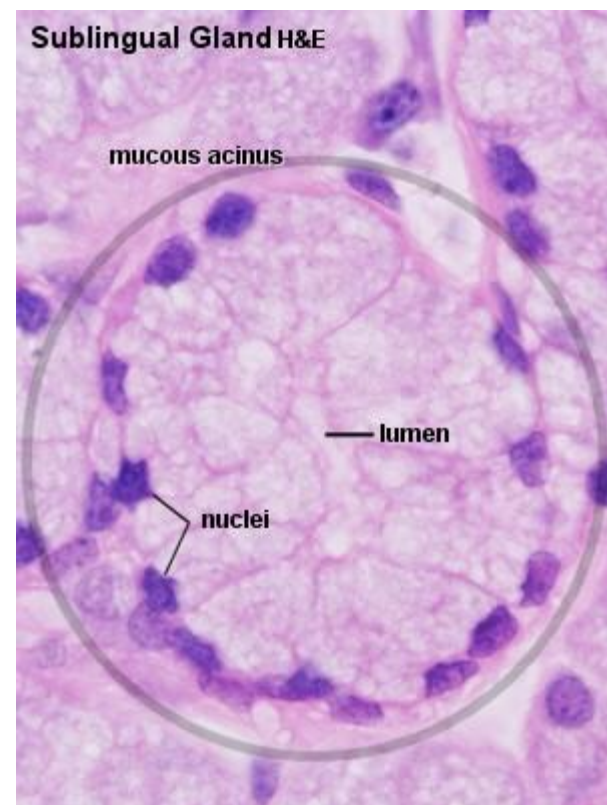
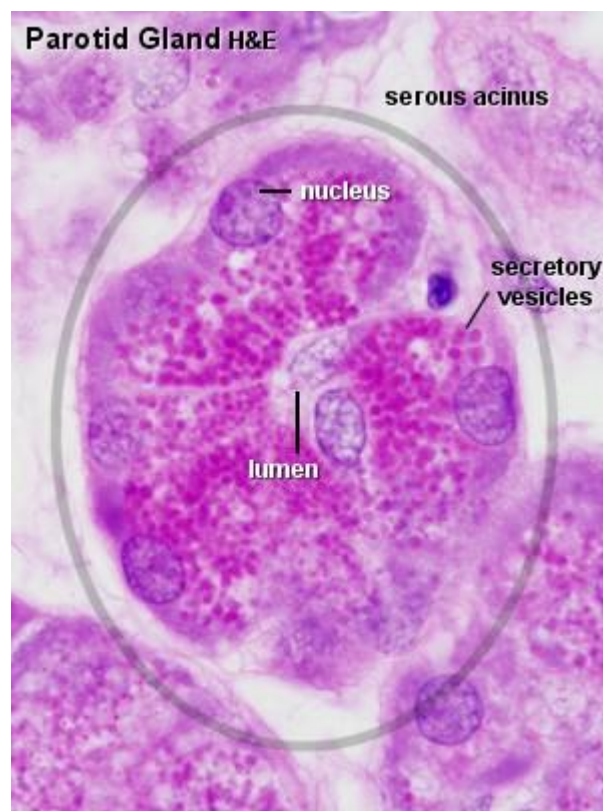


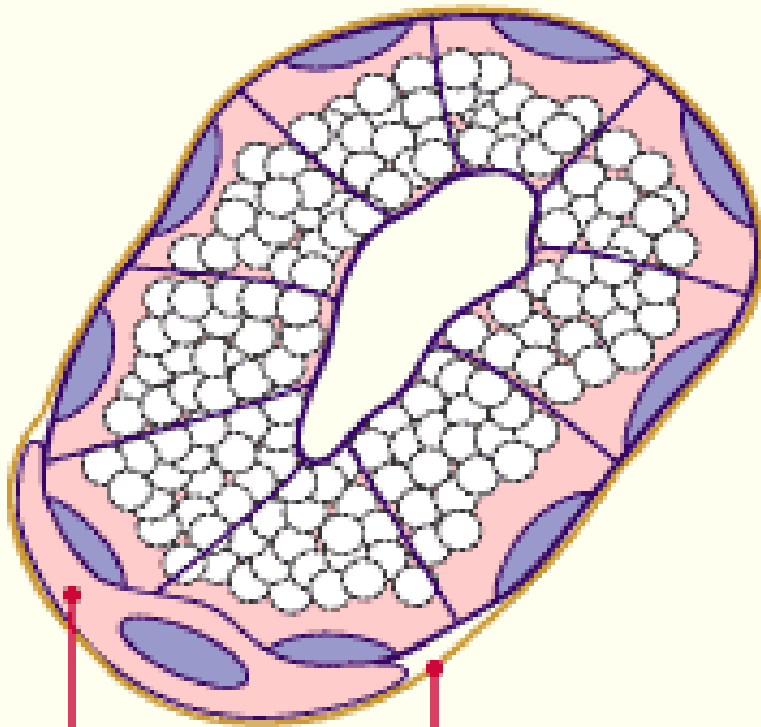
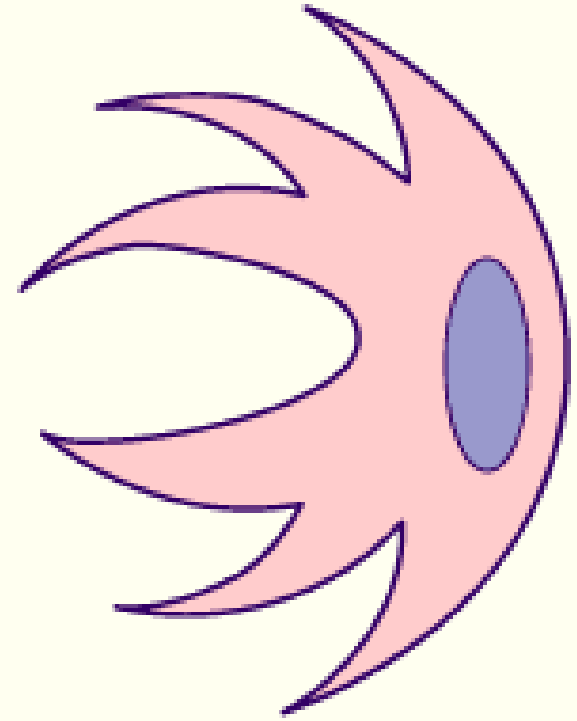
Colon Alcian blue & van Gieson





3-Korpus glandulelerin yaptığı salgının türüne göre





2-KASSEL EPITEL
(MYOEPITHEL)

1

2

Slide 43 Thick skin



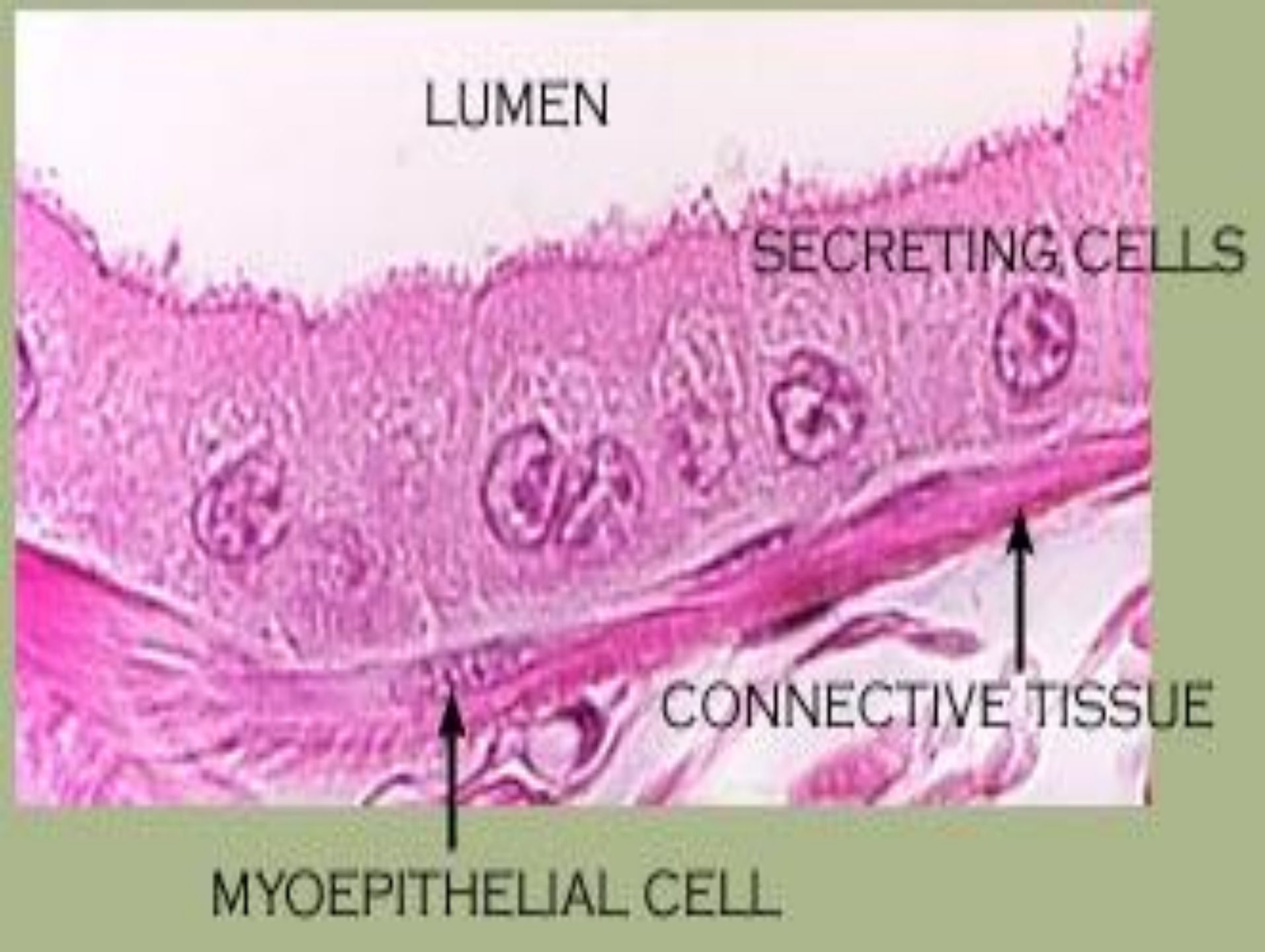
Myoepithelial cells

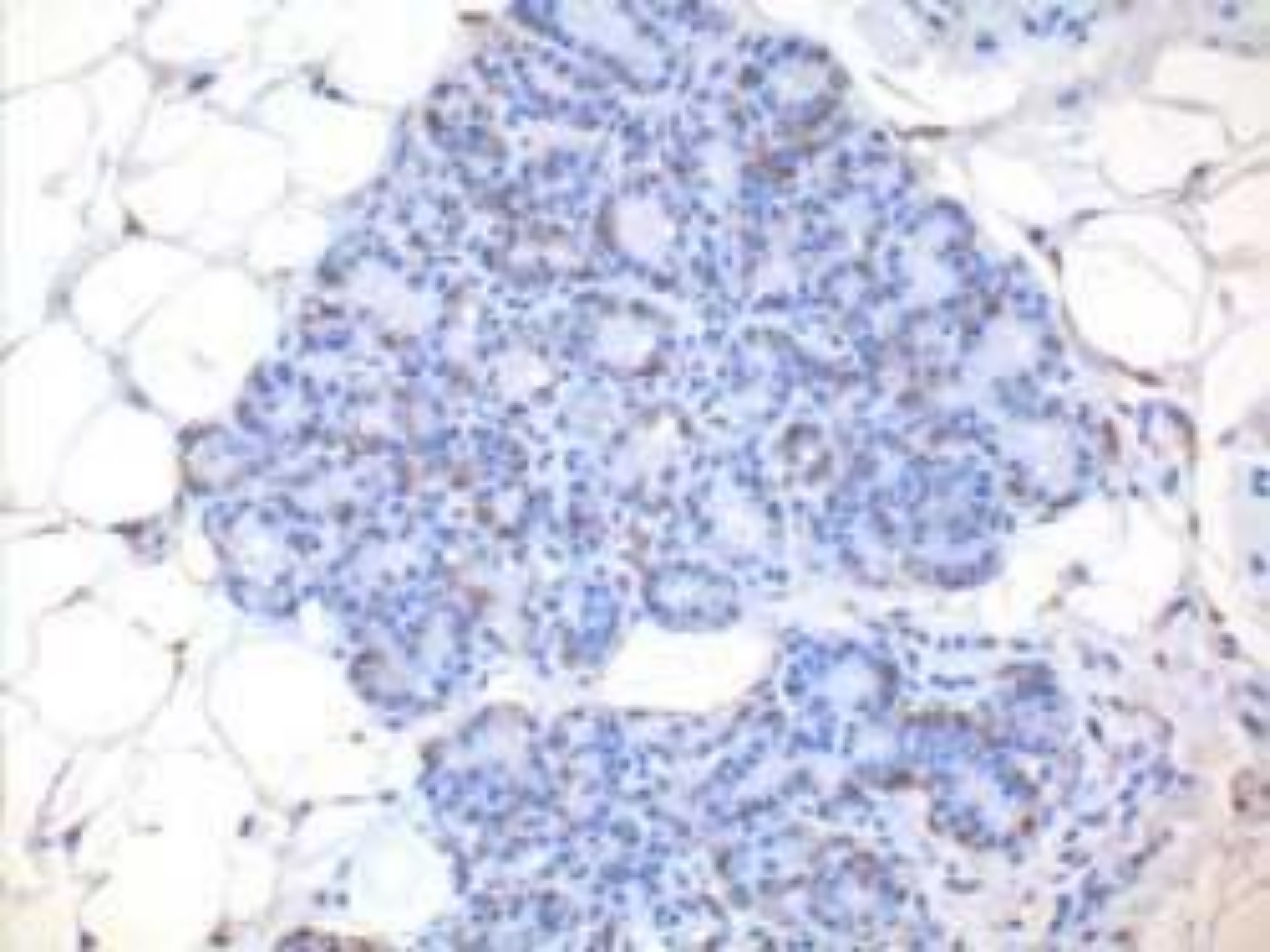
LUMEN

SECRETING CELLS

CONNECTIVE TISSUE

MYOEPITHELIAL CELL





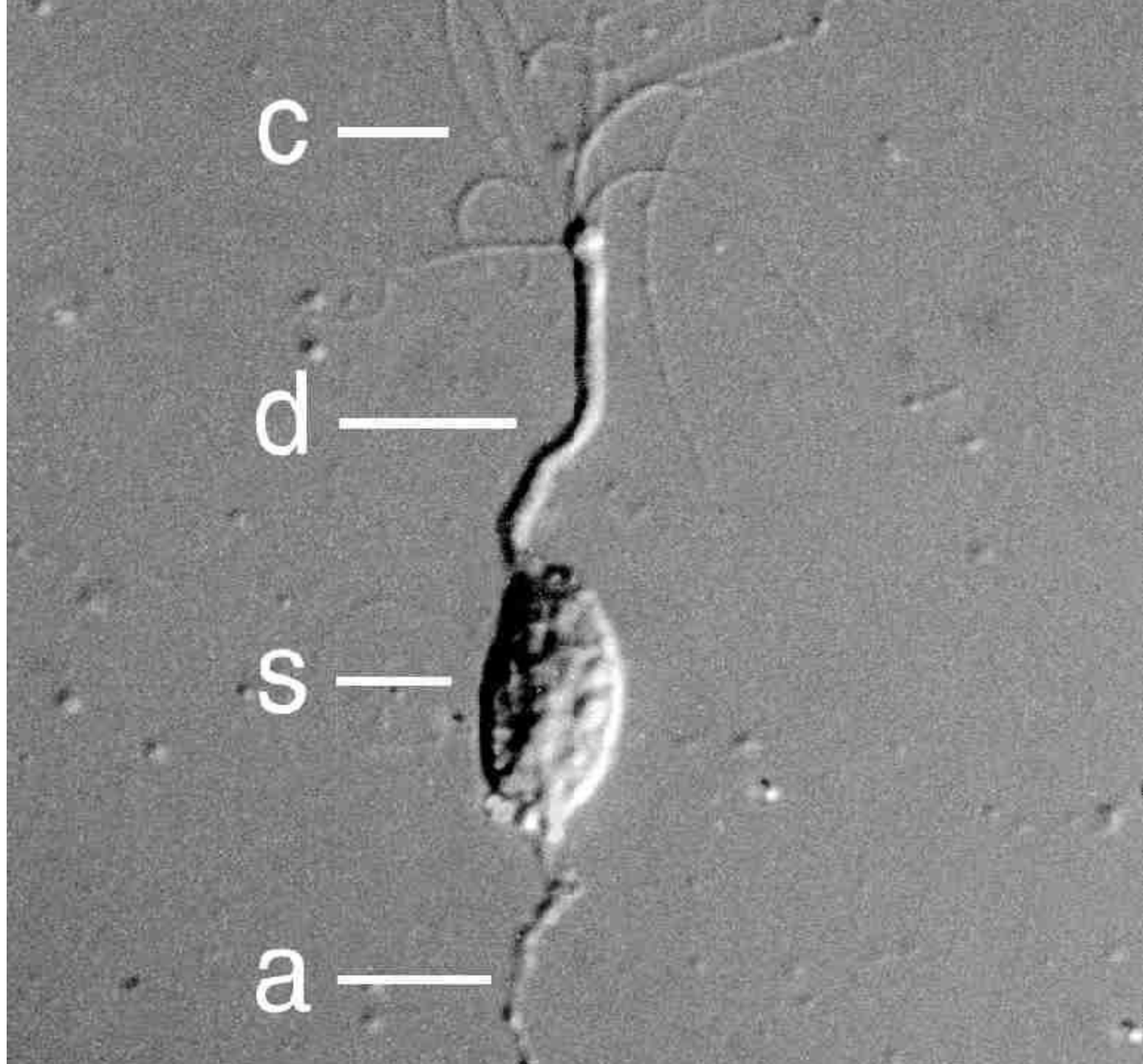
4-DUYU EPİTELI (Nöroepitel)

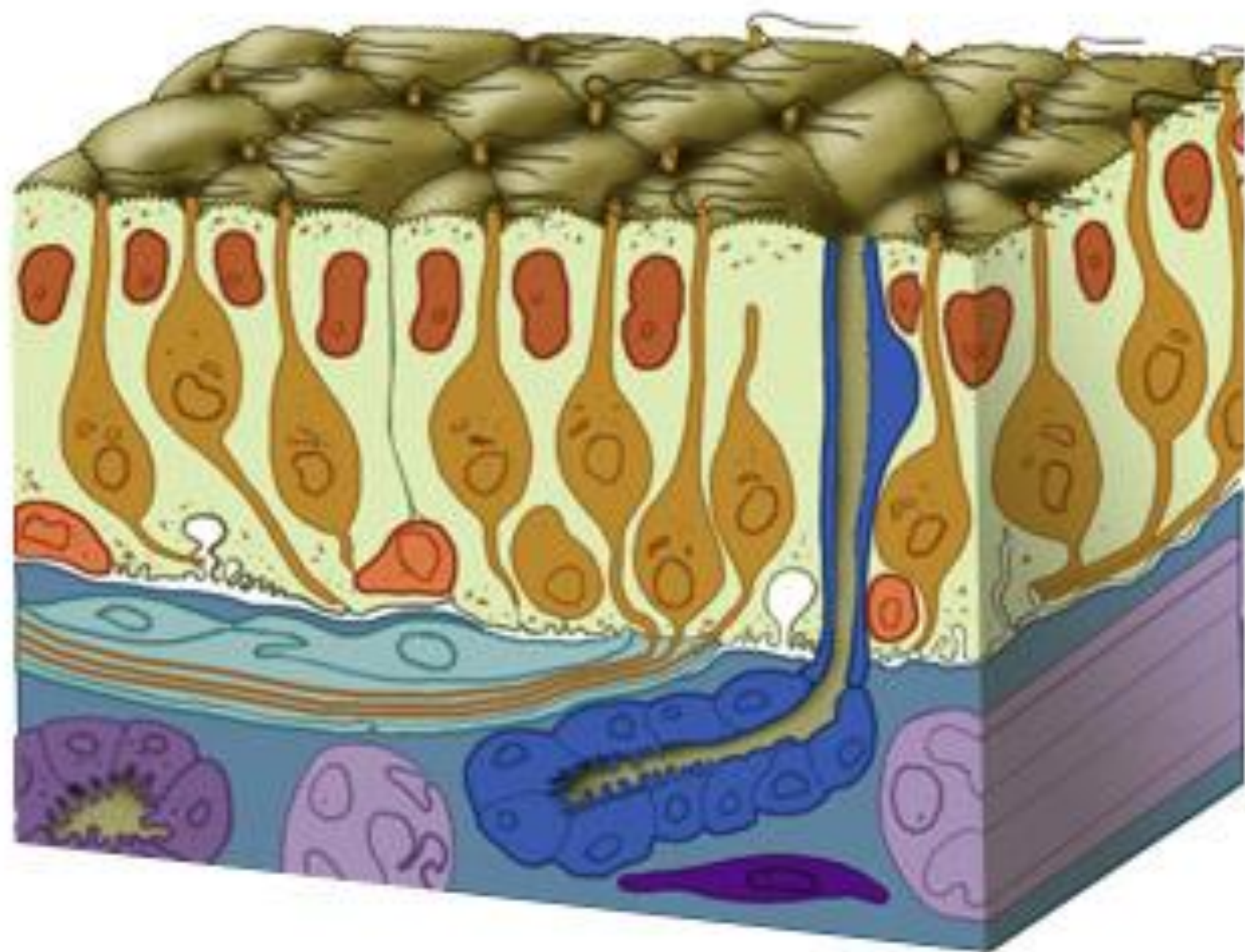
c —

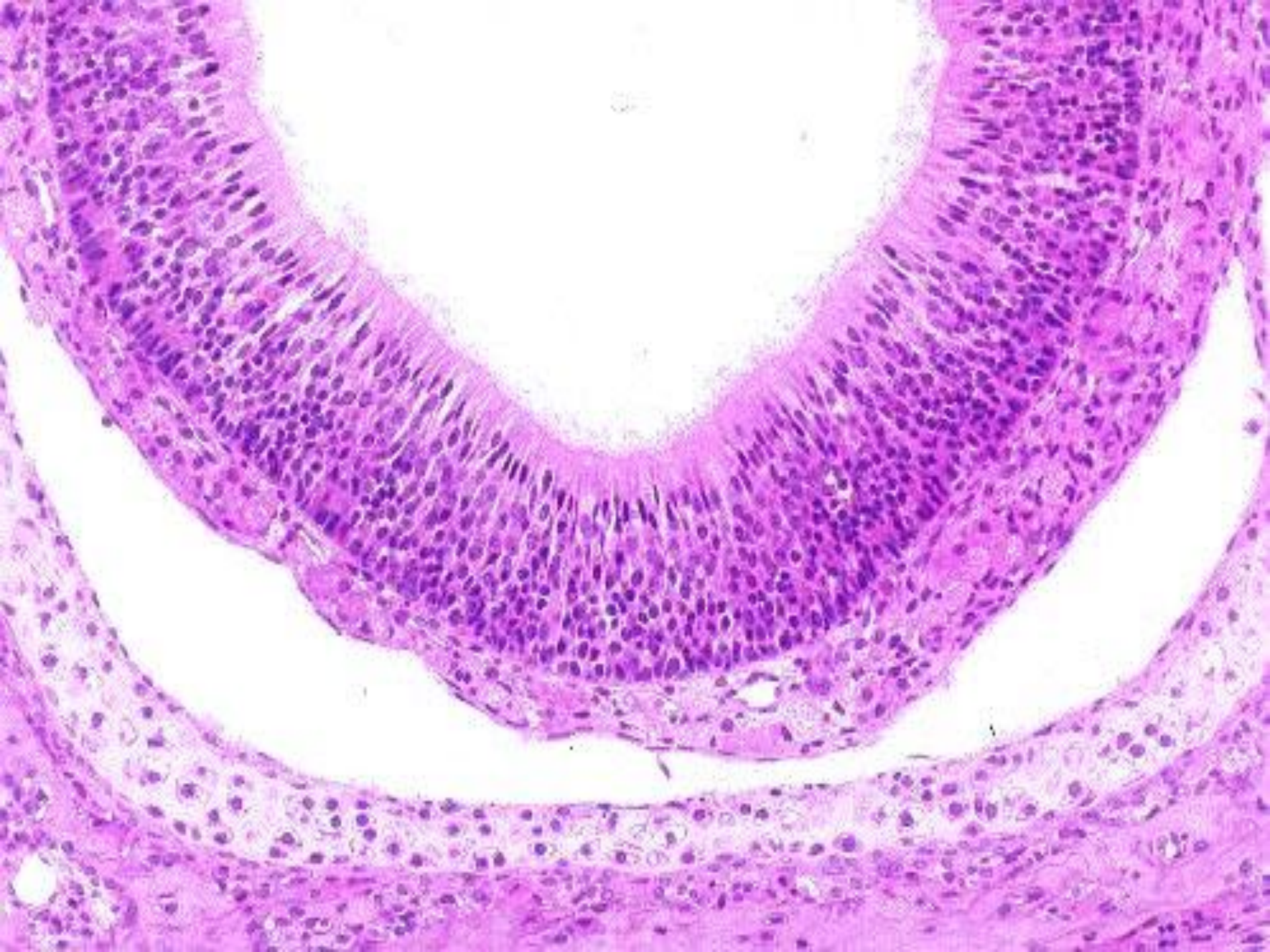
d —

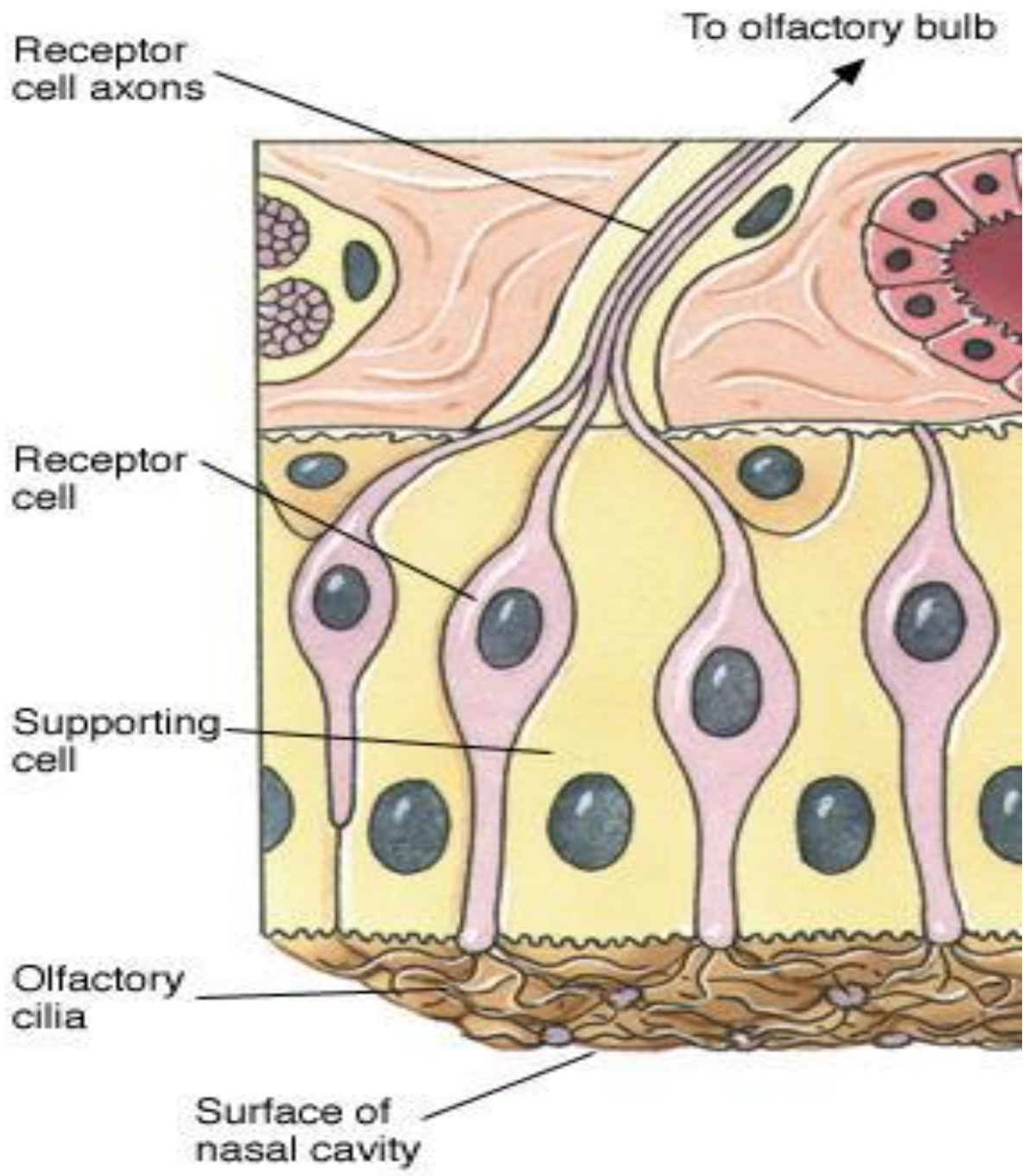
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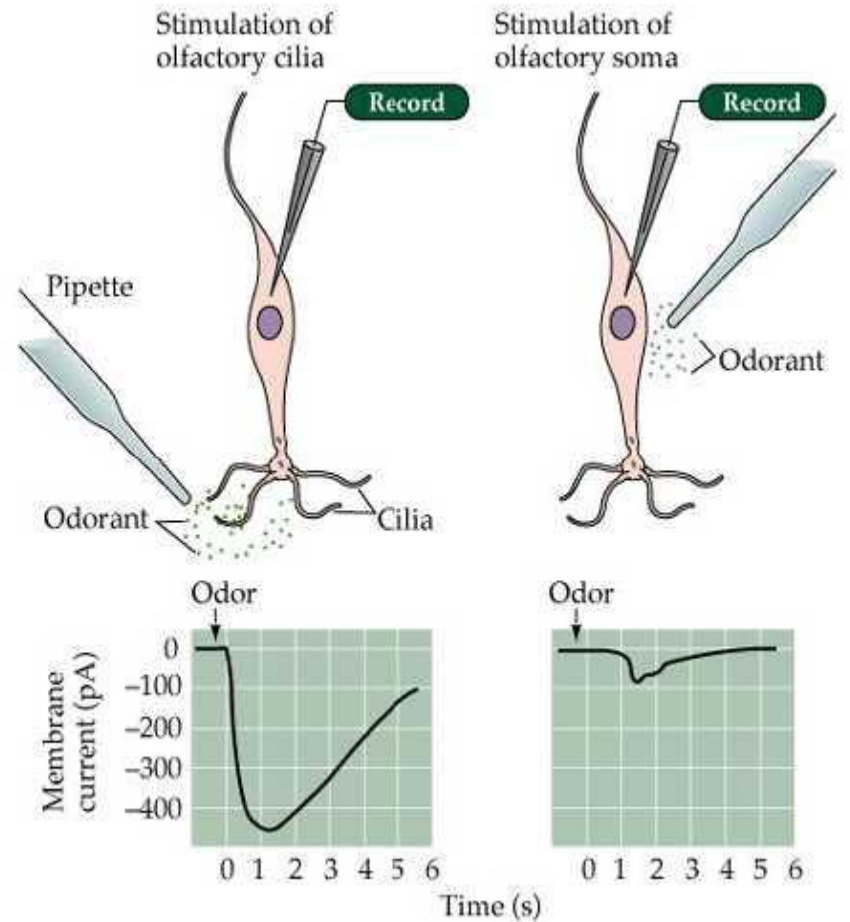
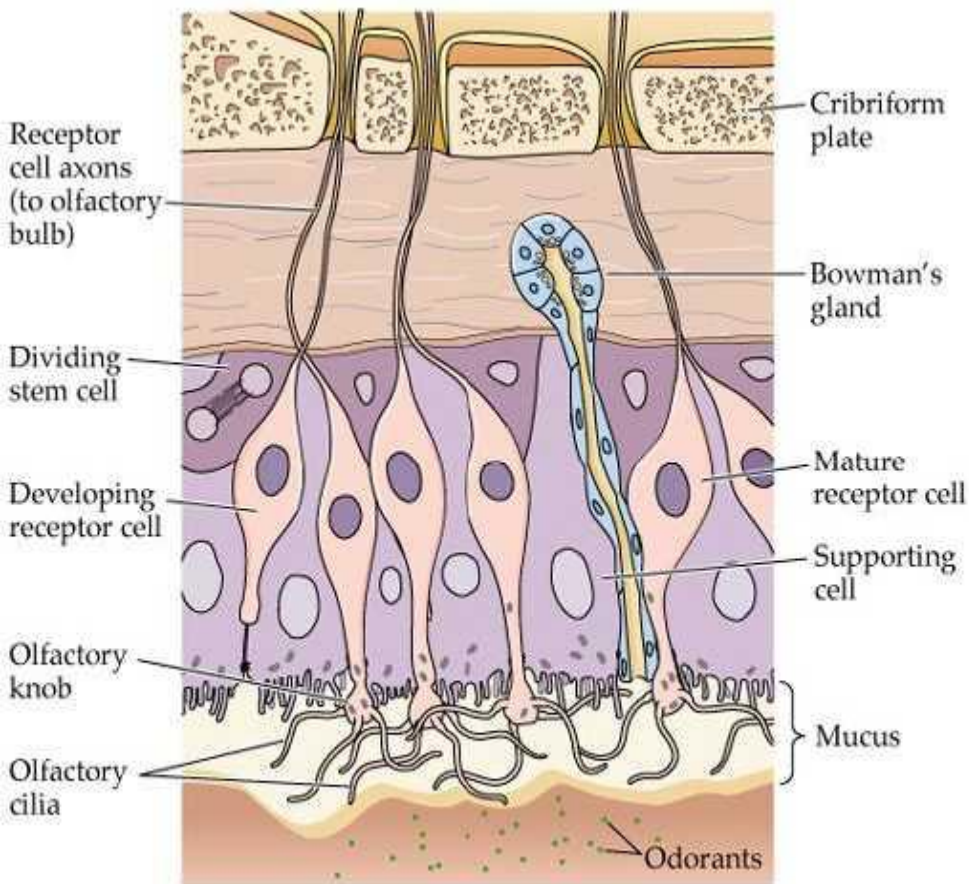
a —

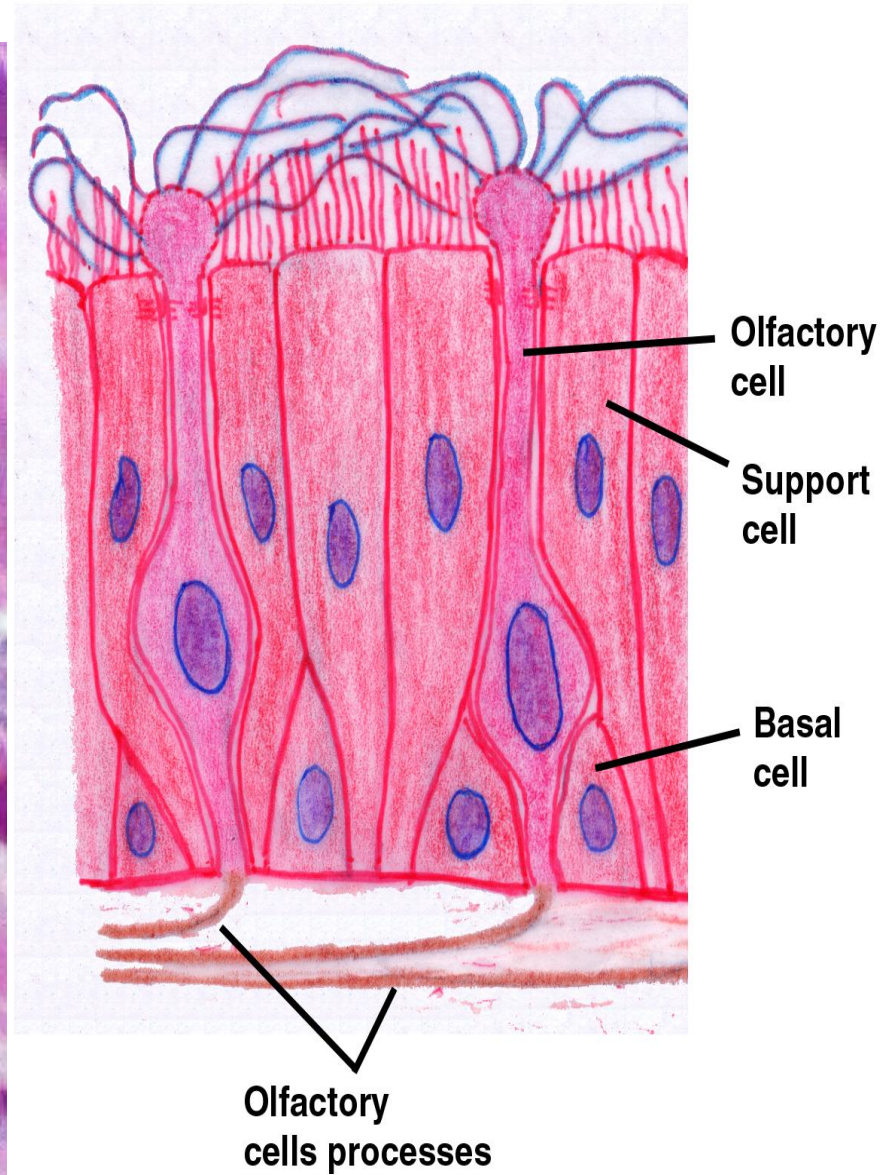
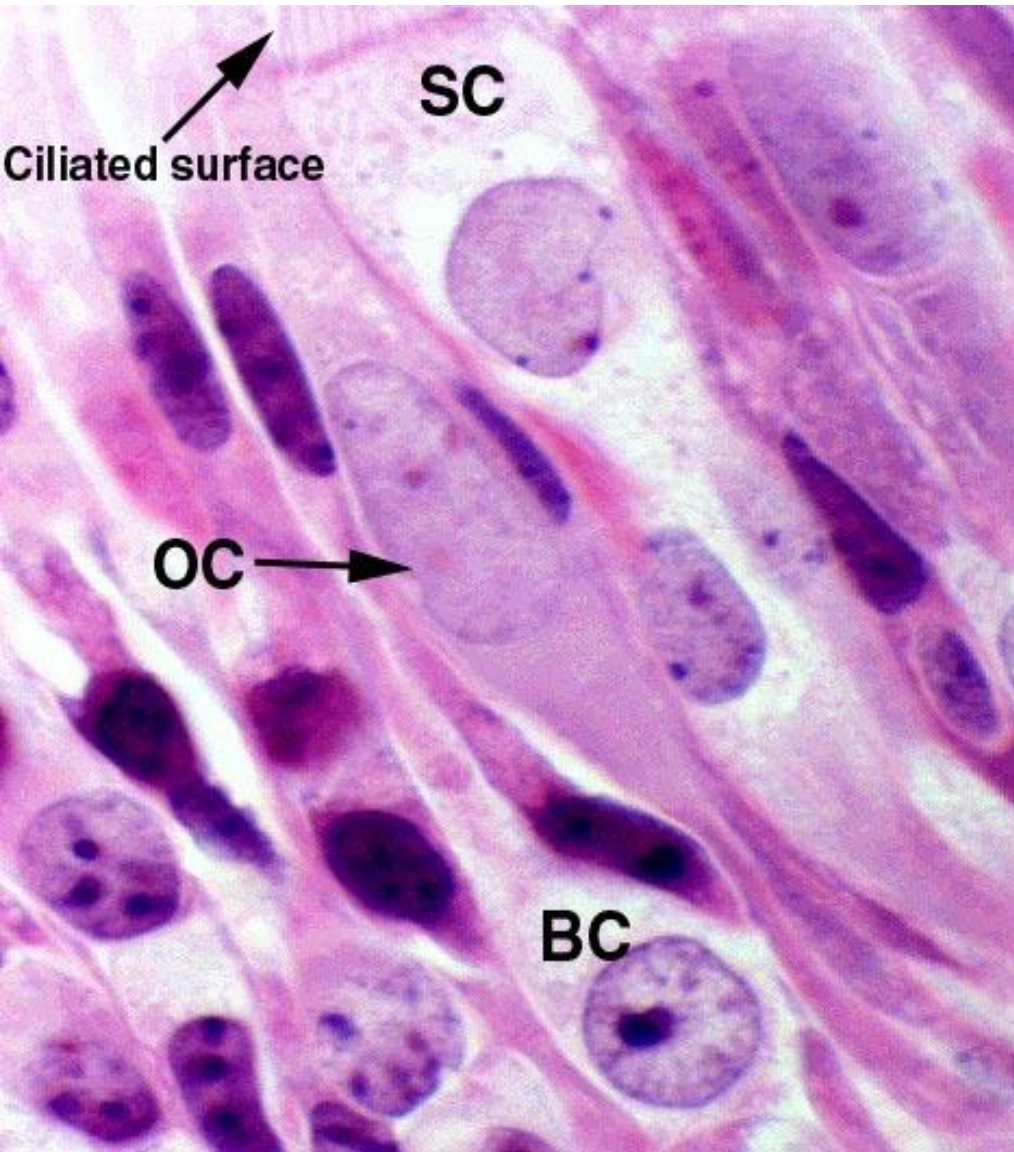






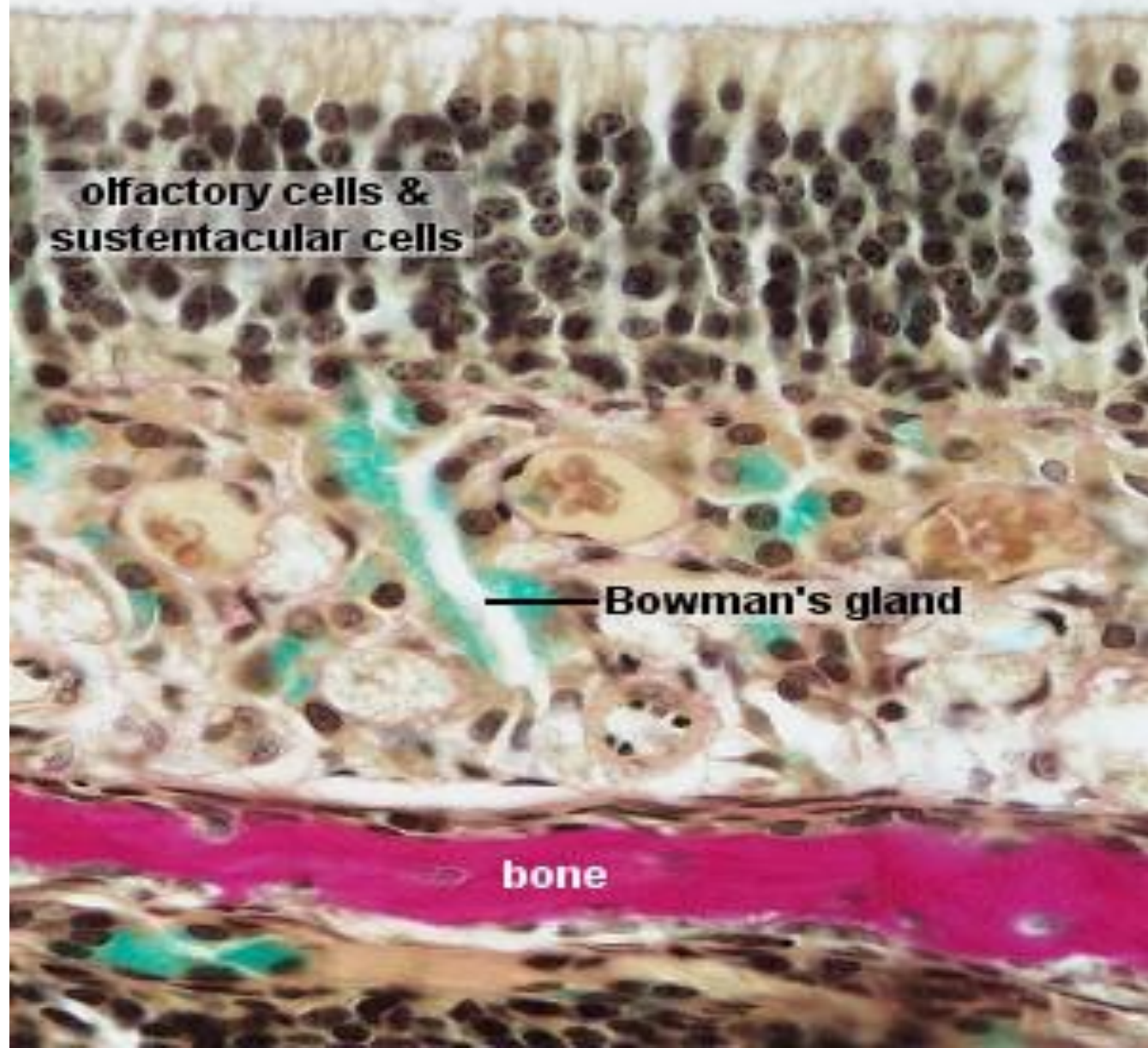


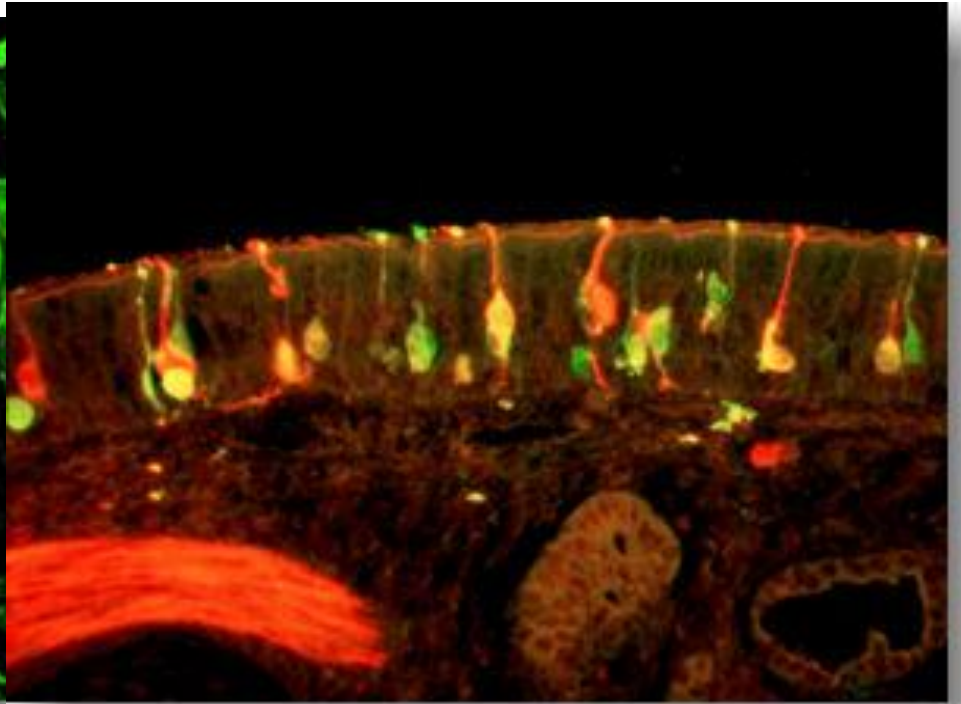
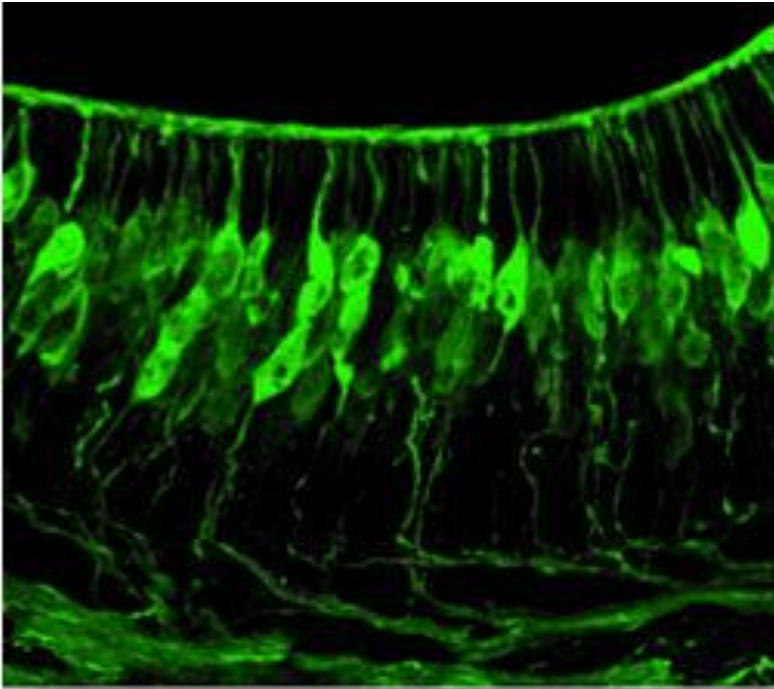


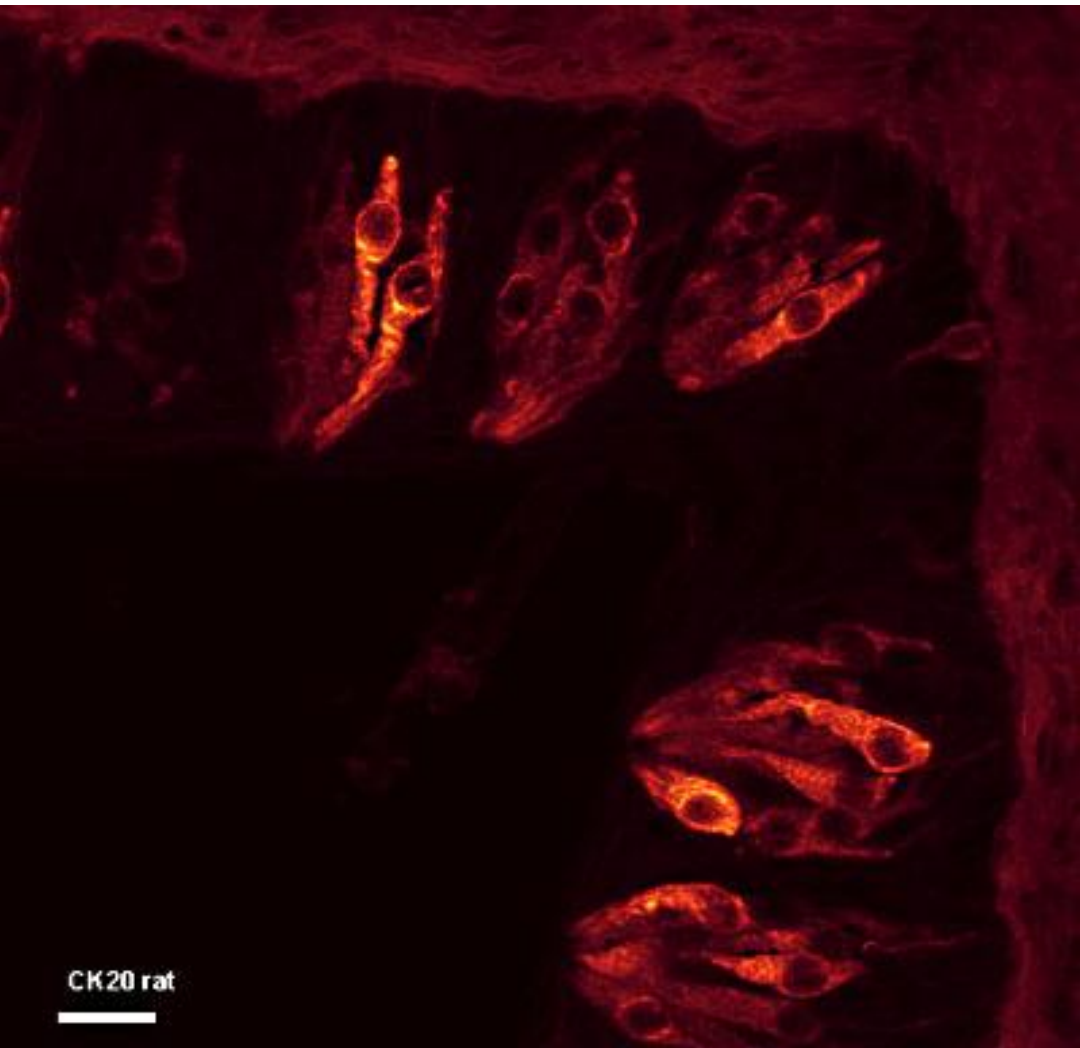
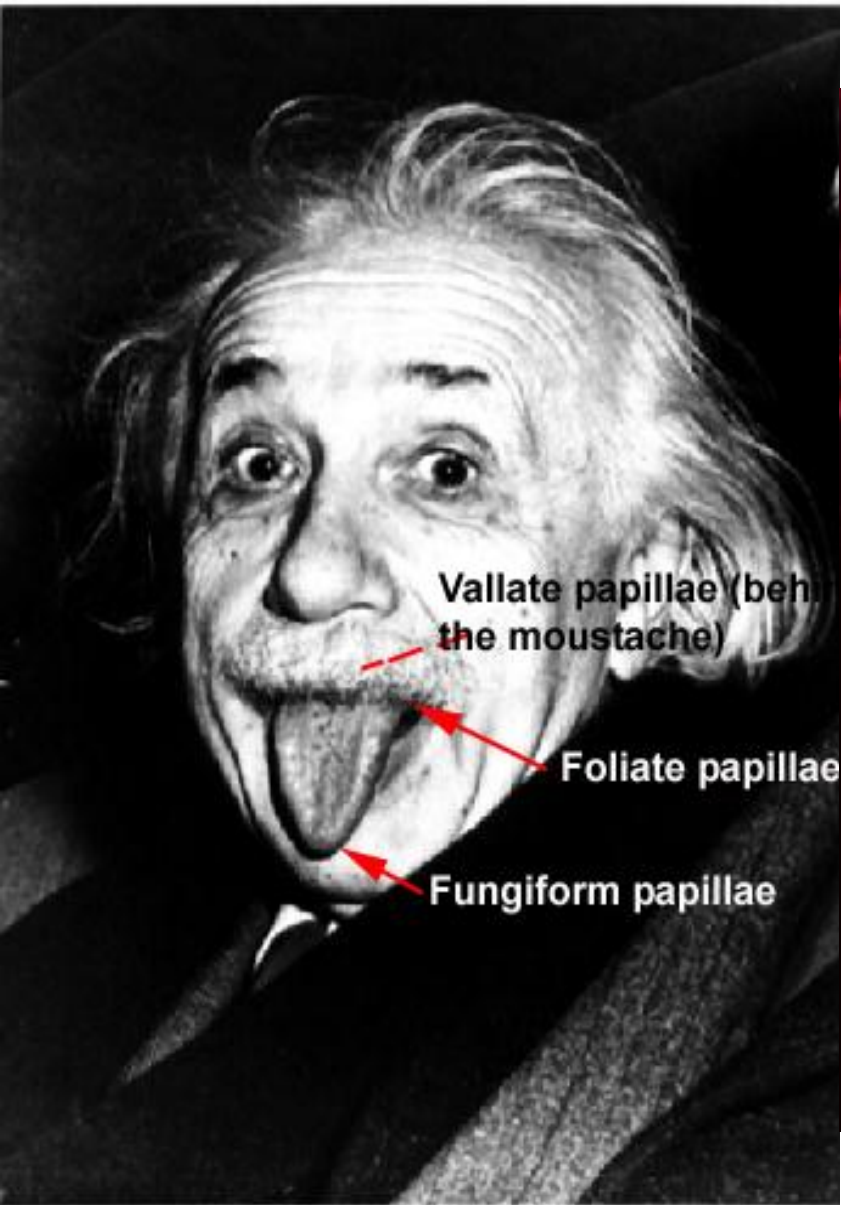


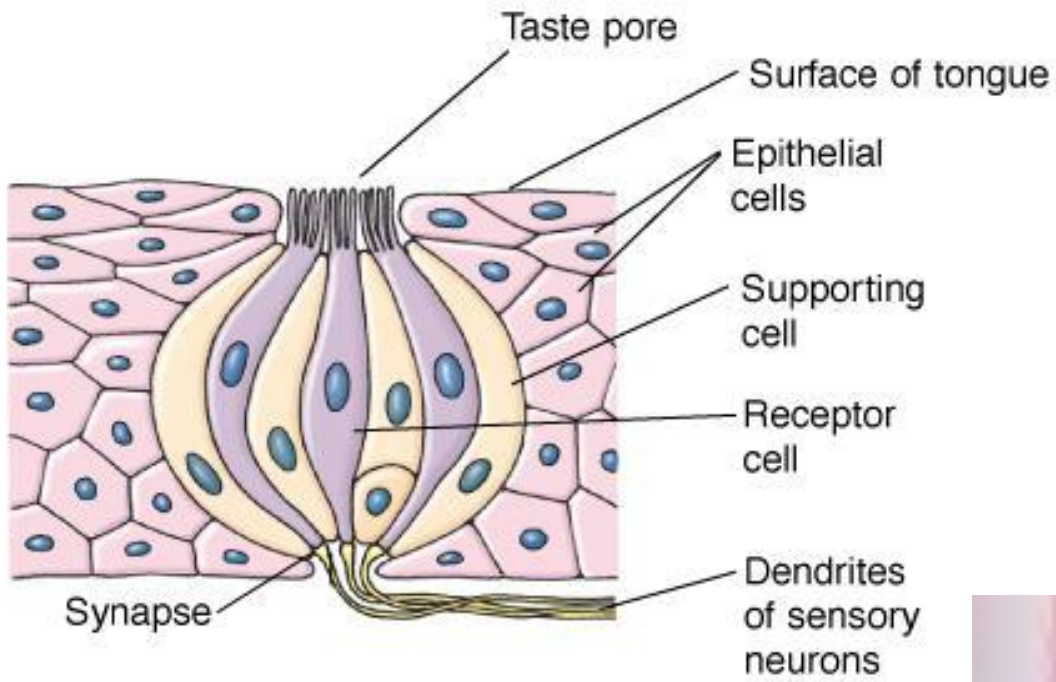
Nasal Cavity - Olfactory Region

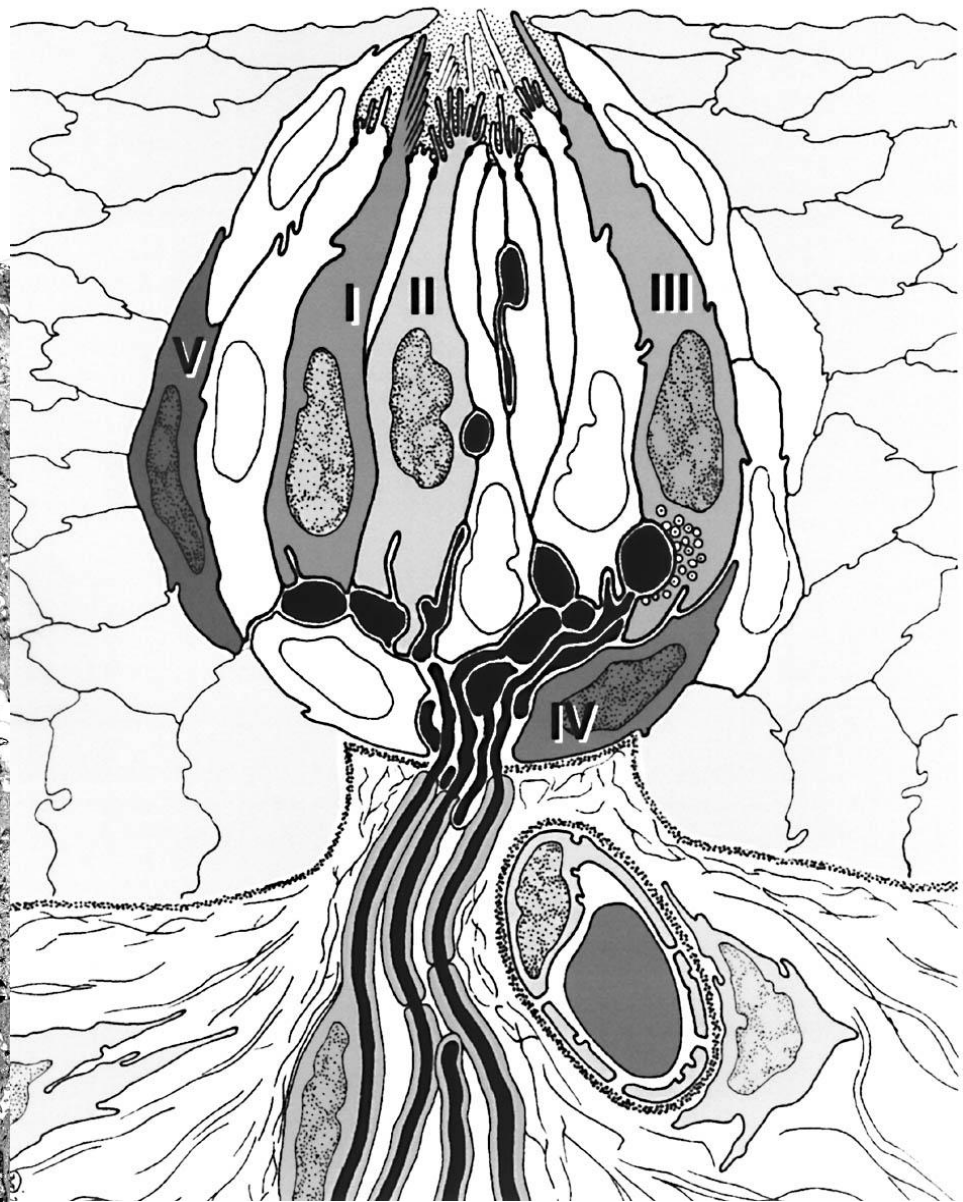
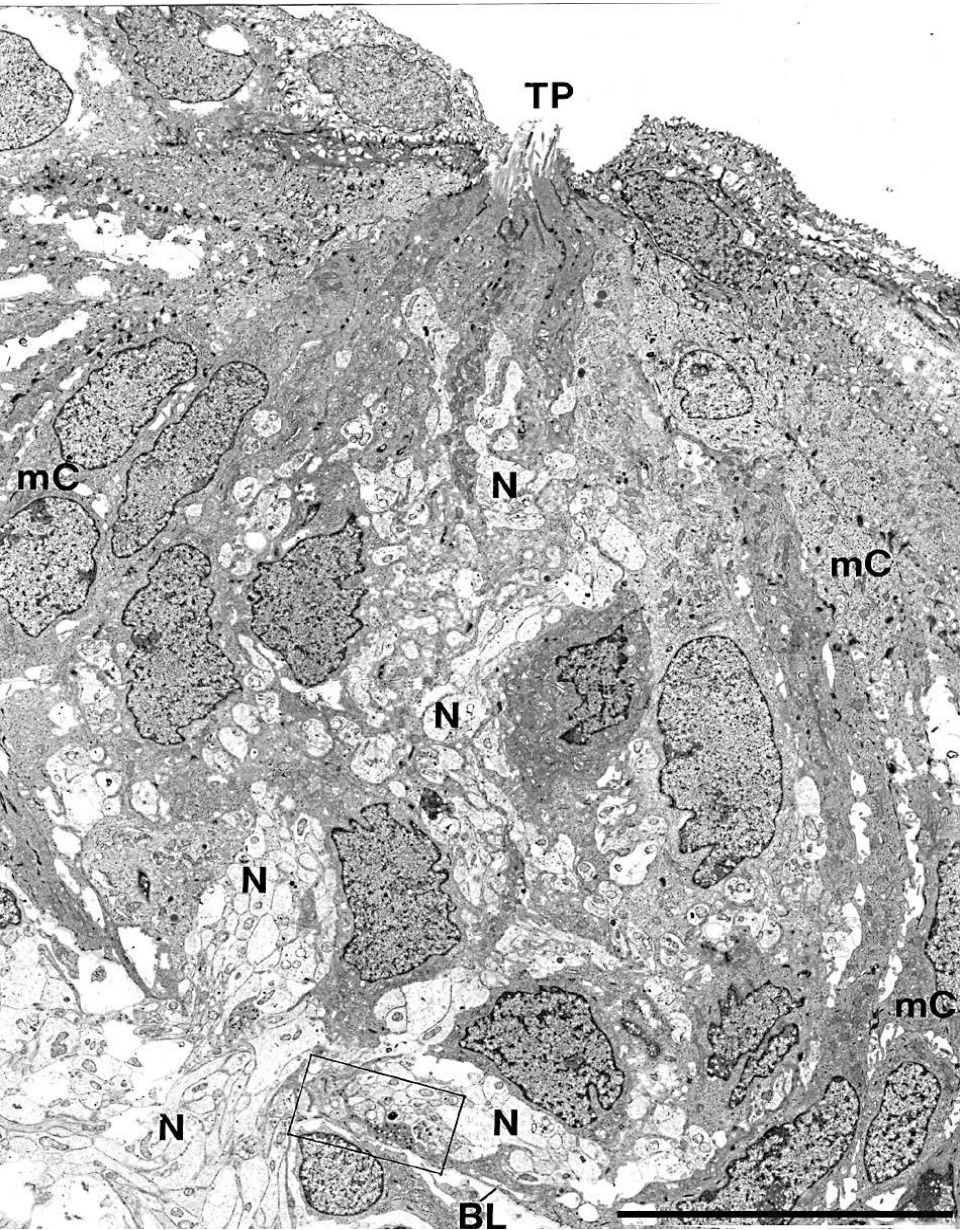
Alcian blue & van Gieson











KAYNAK LİSTESİ

1. Veteriner Özel Histoloji (Ed. Aytekin Özer, 2008)
2. Temel Histoloji (Ed. Aytekin Özer, 2011)
3. Genel Histoloji (Mahmut Sağlam, R.Nuri Aştı, Aytekin Özer 2001)
4. Özel Histoloji (Attila Tanyolaç 1999)
5. Histoloji (Ercan Artan 1988)
6. Textbook of Histology (Leeson Leeson Paparo 1981)
7. Basic Histology (L.C. Jungueira, J.Carneiro 1983)
8. Textbook of Veterinary Histology (Dellman Brown 1983)
9. Basic Histology (Douglas F. Paulsen 1989)
10. Molecular Biology of the Cell (Bruce Alberts, Denis Brg, Julian Lewis, Martin Reff, Keith Roberts, James D. Welson 1989)
11. Histology and Cell Biology (Kurt E. Johnson 1990)
12. Wheater's Interactive Histology (CD-ROM) (Wheater, P. R.1995)
13. A Brief Atlas of Histology (Thomas leeson, C. Roland Leeson 1979)
14. Oral Histology: Development, Structure and Function (Ten Kate, Arnold Richard 1980)
15. Bloom and Fawcett a Textbook of Histology (Fawcett, Don W 1986)