Human Histology Lab 2

1st stage

2020-2021

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Respiratory system

Layouts

- Organs of the respiratory system
- The upper respiratory tract
- The lower respiratory tract

Organs of the respiratory system

Organs of the Respiratory system

- Nose
- Pharynx
- Larynx
- Trachea
- Bronchi
- Lungs – alveoli

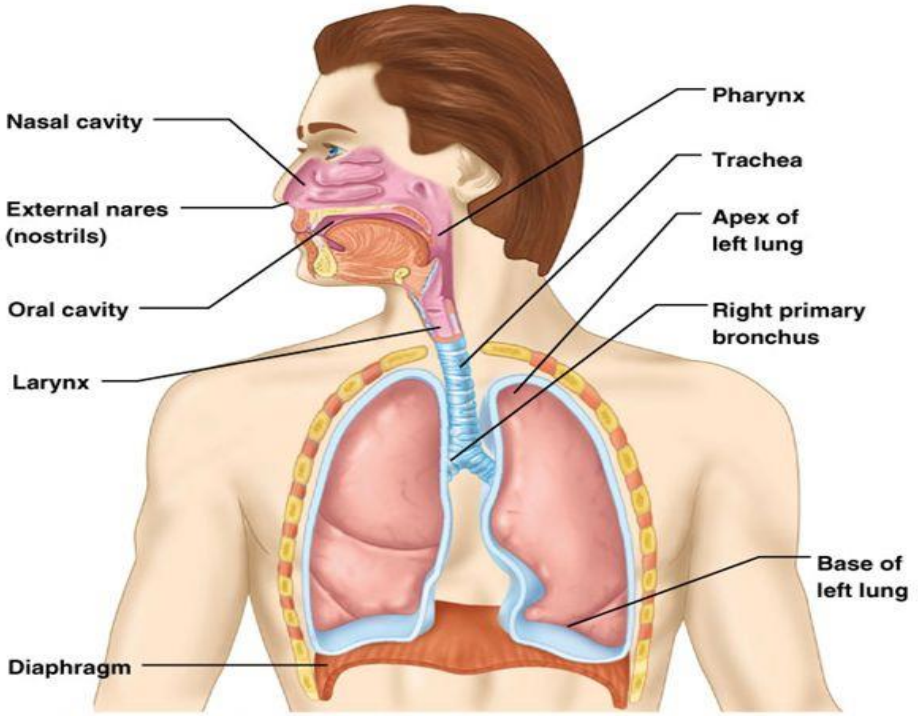
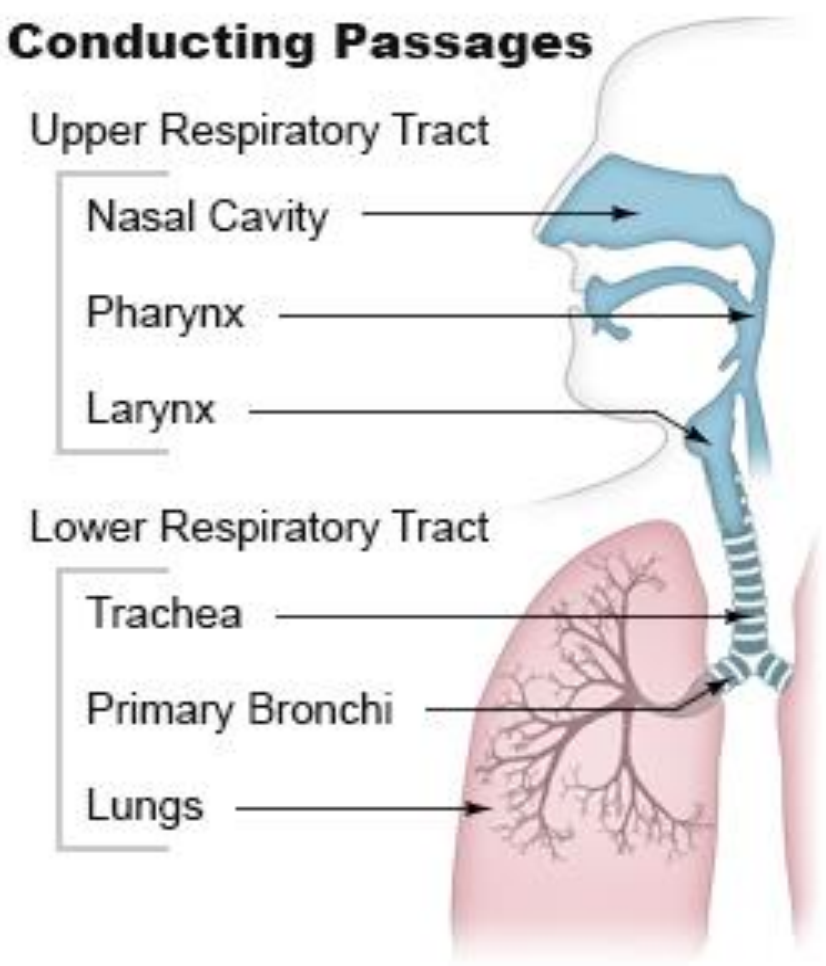
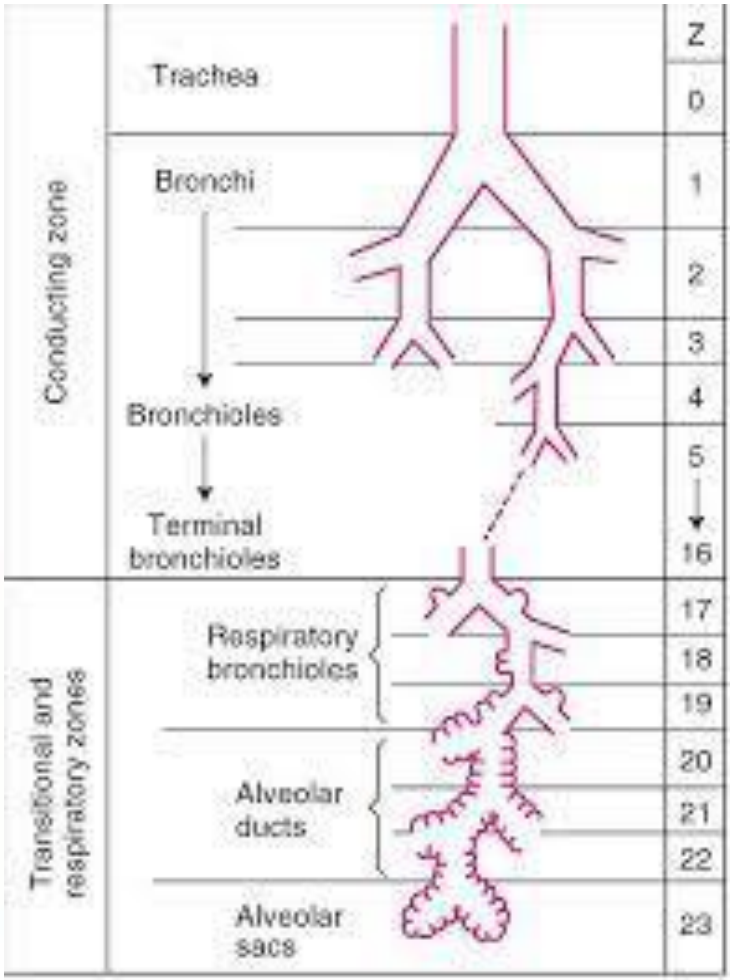


Figure 13.1 *Slide 13.1*

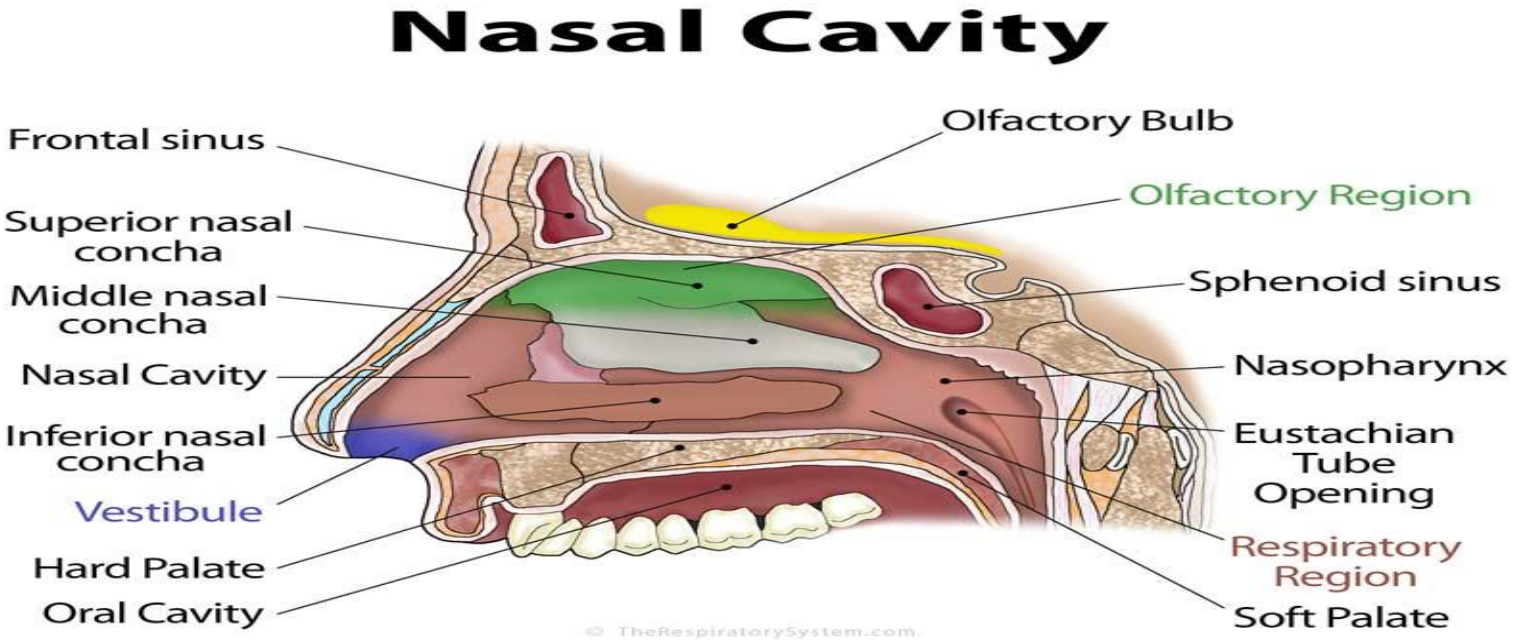
The Respiratory tract





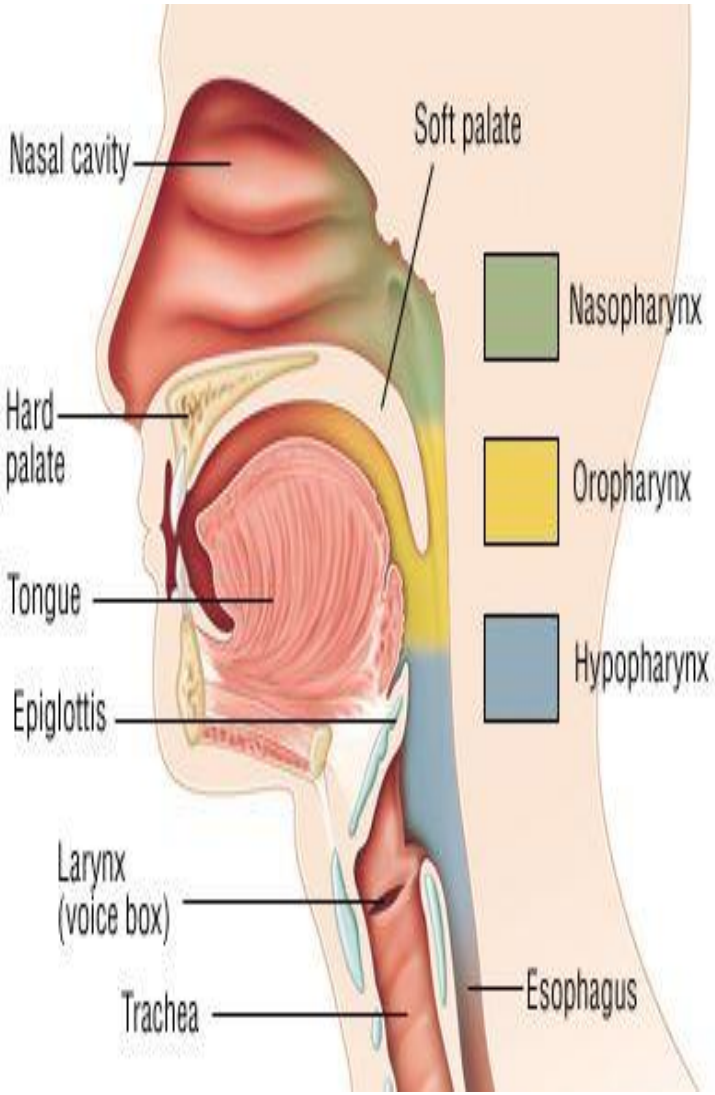
Nasal cavity /nasal fossa

- The nasal cavity consist of 2 structure :
- 1-external vestibule
- 2-internal nasal fossa

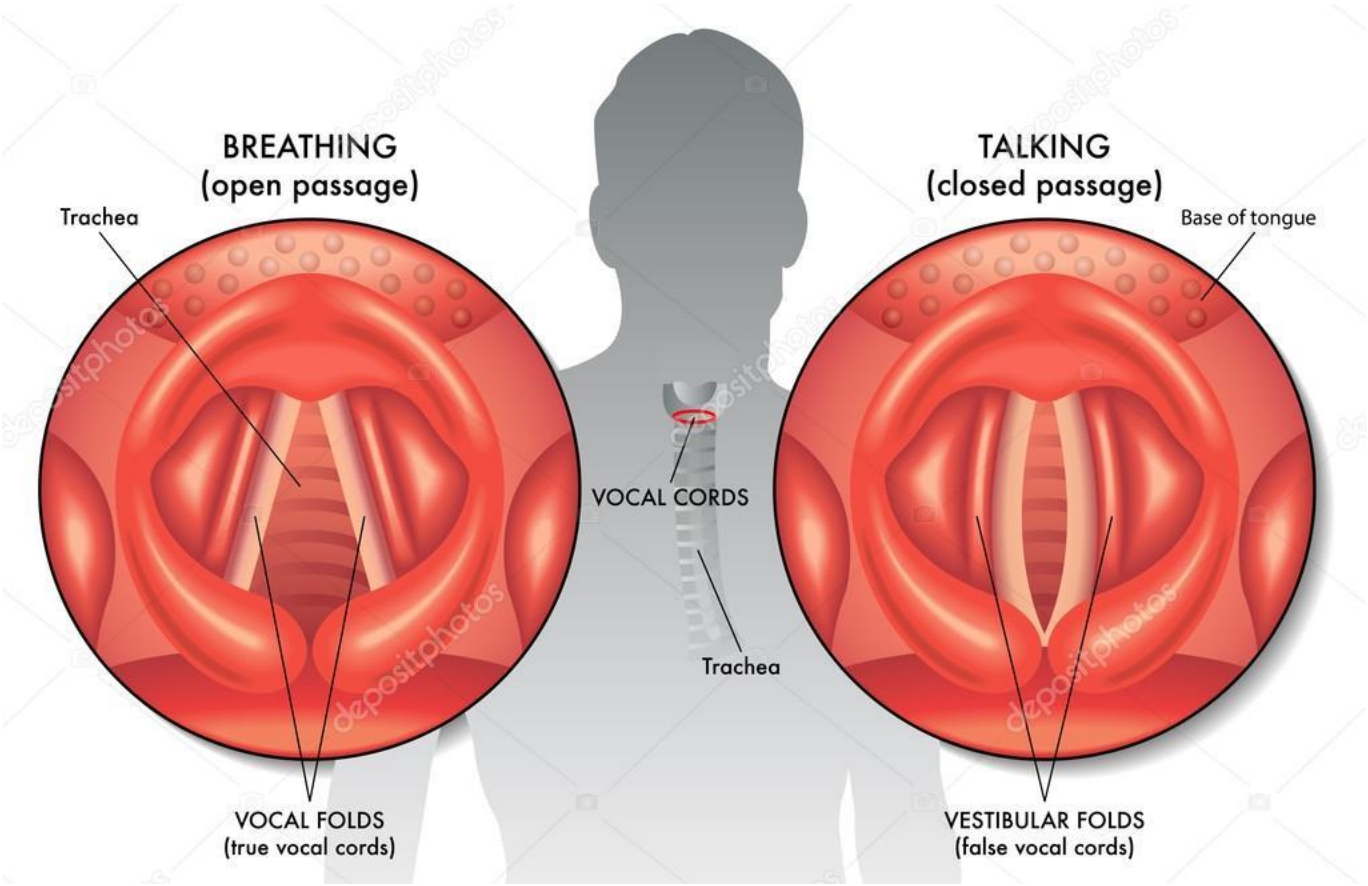


Pharynx , Larynx (voice box)

- **Pharynx** connect the nasal cavity with the larynx
- Nasopharynx
- Oropharynx
- Hypopharynx
- **Larynx** connect the pharynx and trachea
- Epiglottis
- True vocal cords
- False vocal cords



Larynx (Voice box)



Nasal cavity

- Olfactory organ

A specialized area of the mucous membrane in the superior concha ,located in the roof of the nasal cavity. Consist of 4 types of cells:-

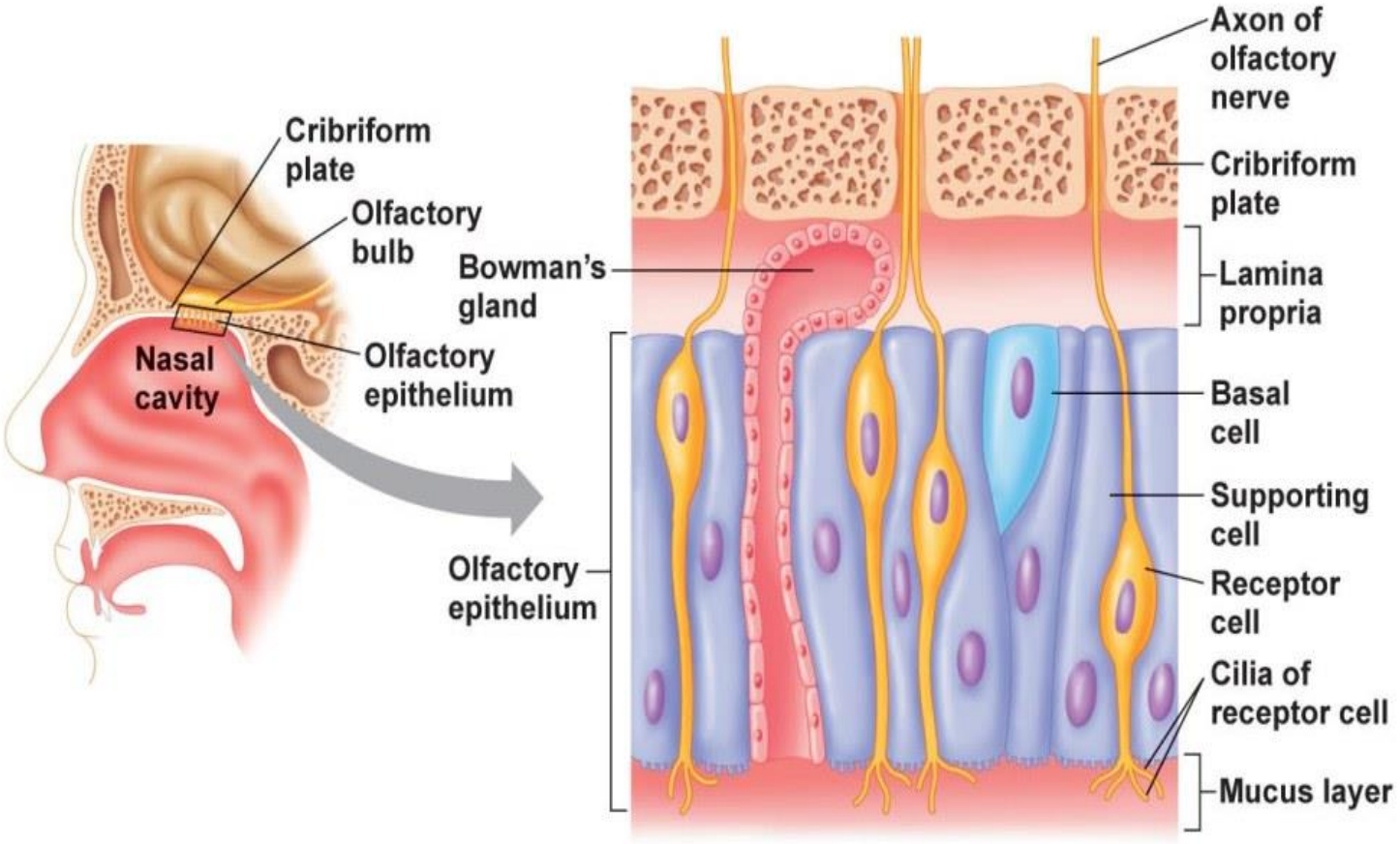
1-olfactory cells

2-supporting cells

3-basal cells

4-Bowman's gland cells

Nasal cavity

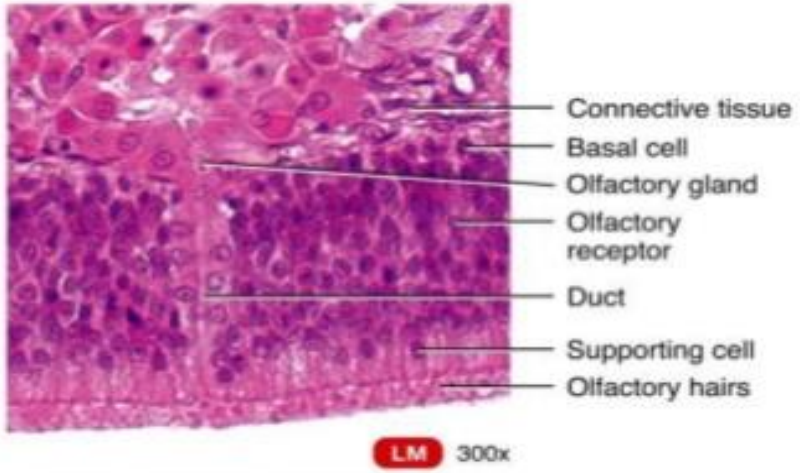


Nasal cavity

Nasal cavity

Olfaction

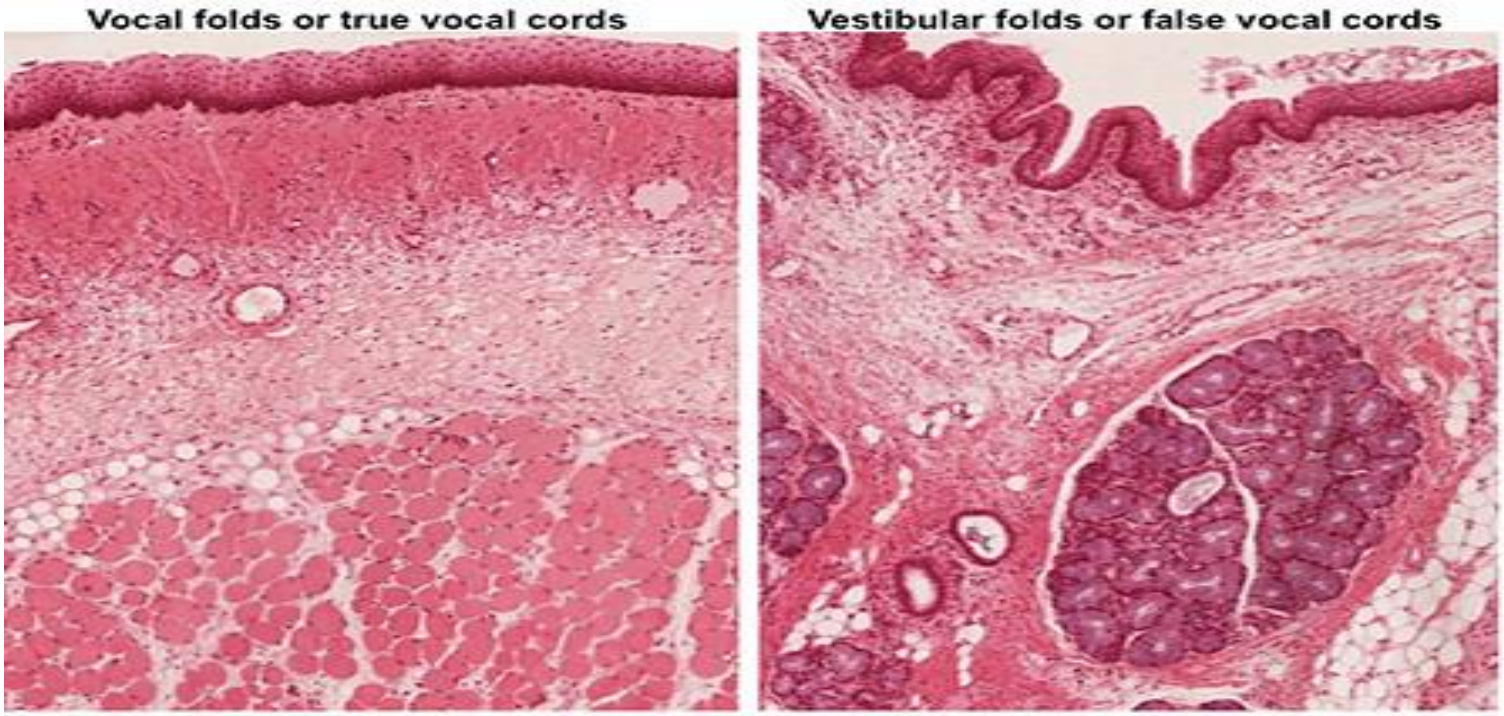
- The olfactory epithelium consists of **3 kinds of cells:**
  - The **olfactory receptor**
  - **Supporting cells**
  - **Basal cells**



(c) Histology of olfactory epithelium

Larynx(voice box)

- Vocal cords are lined by stratified squamous epithelium



Respiratory epithelium

- Most of the conducting portion is lined with ciliated pseudostratified columnar epithelium. typically it consist of mucosa (4 types of cells) and lamina propria (connective tissue)

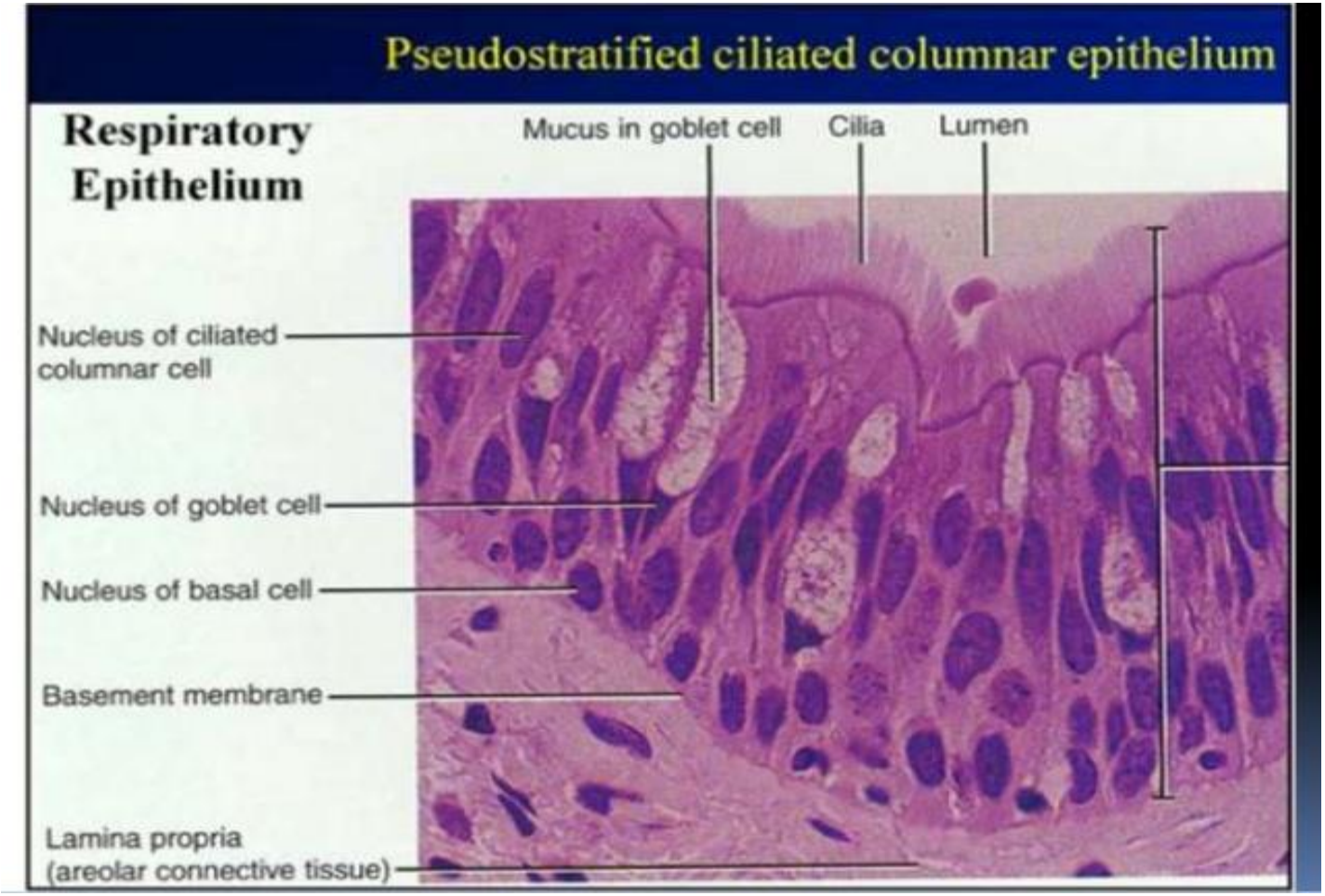
1-cilliated columnar cells

2-Mucous goblet cells

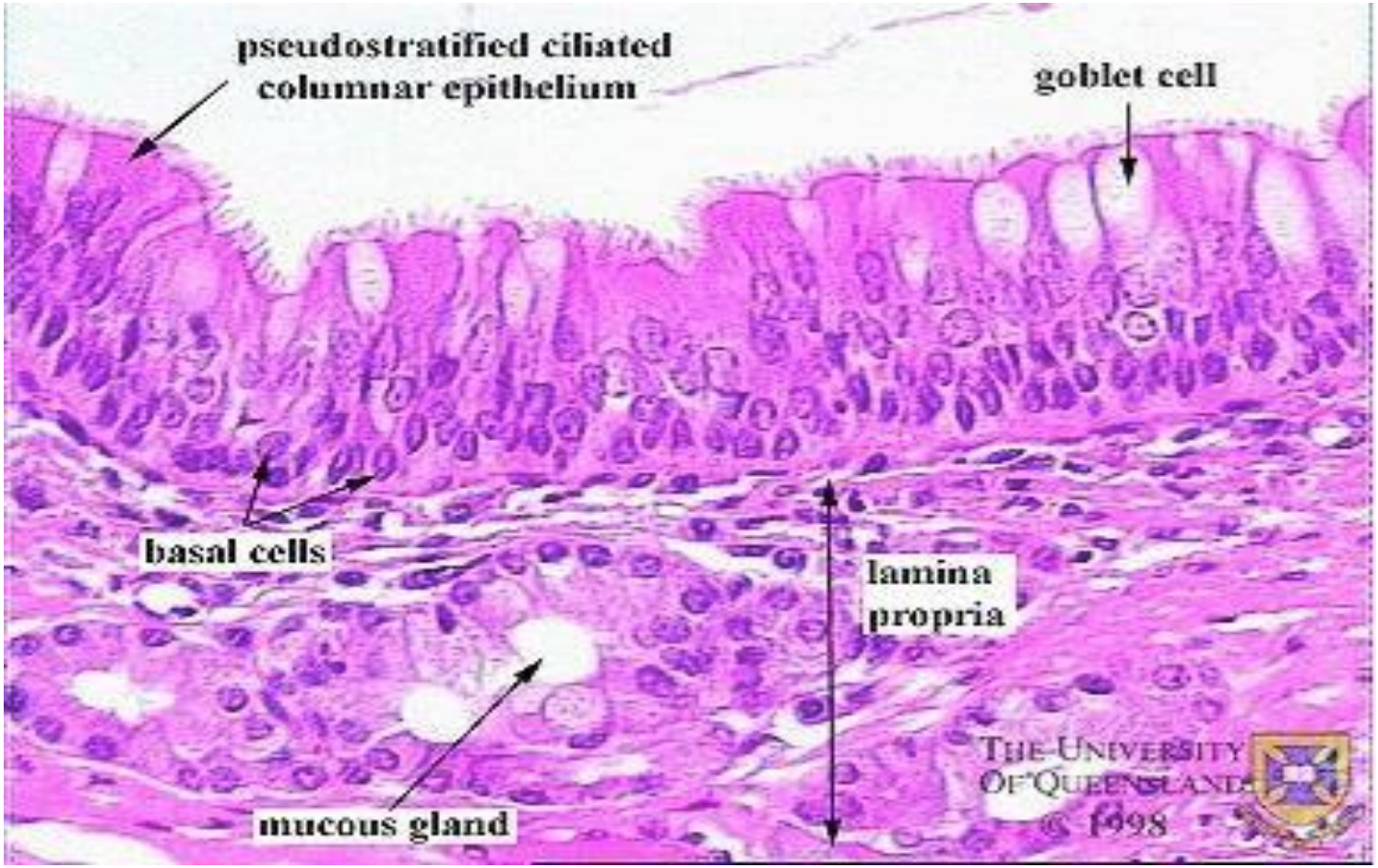
3-Basal(short) cells

4-Small granule cells(Dendritic cells)

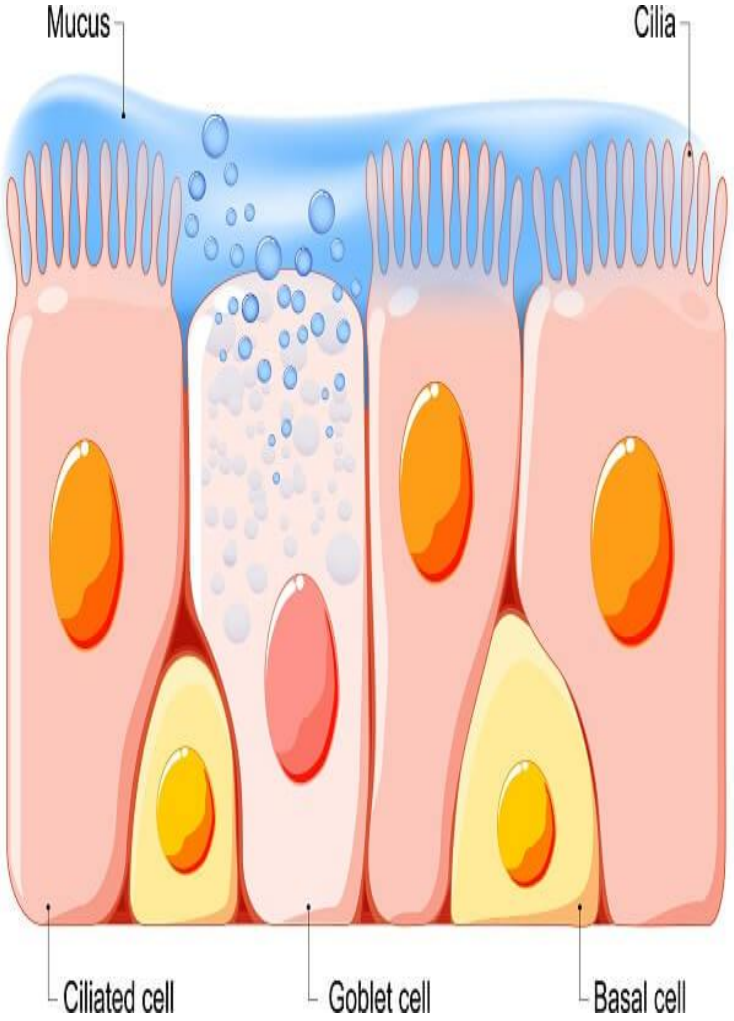
Respiratory epithelium

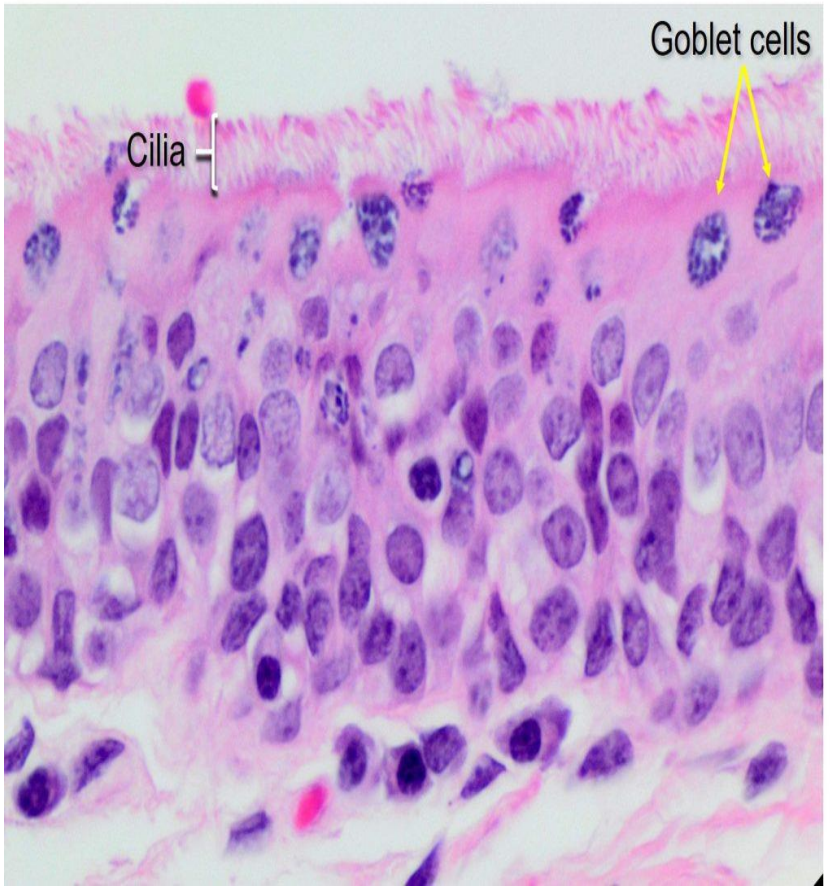


Respiratory epithelium

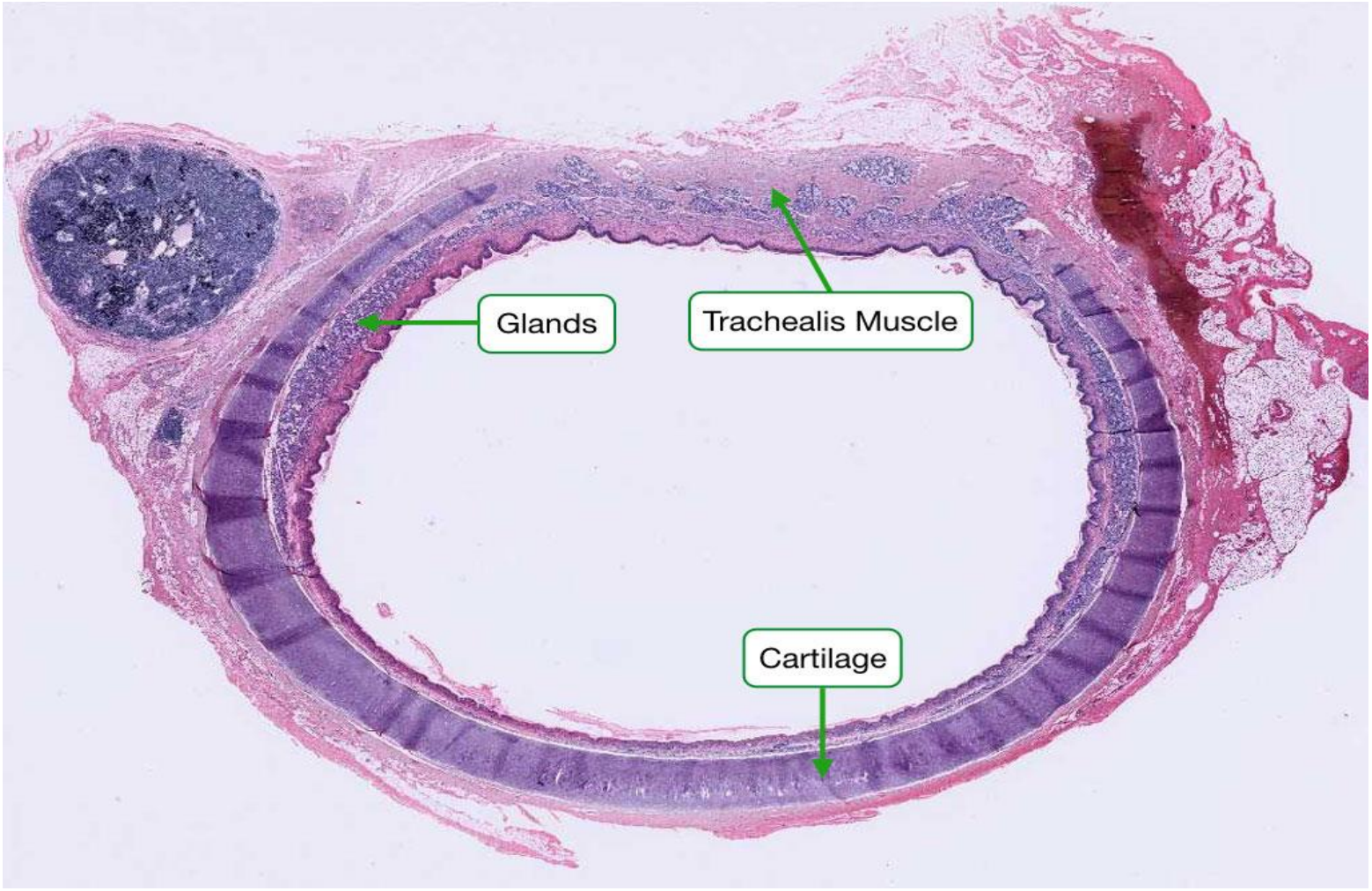


Respiratory epithelium





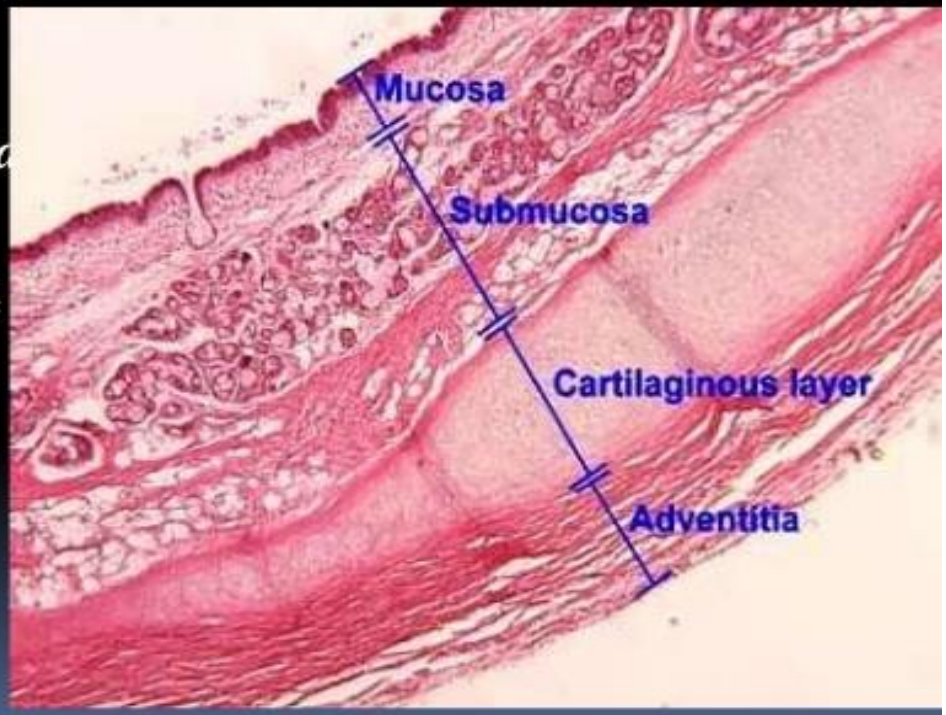
Trachea



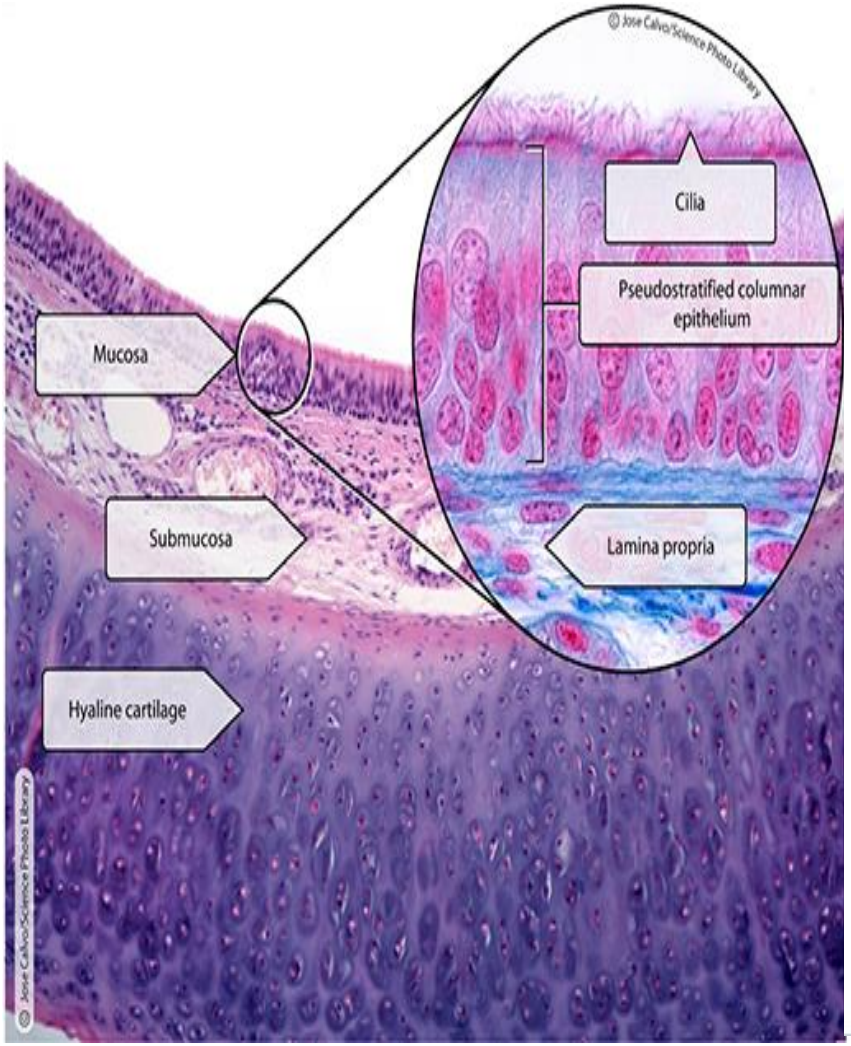
Trachea wall layers

Trachea

- Mucosa
  - *-Epithelium*
  - *-Lamina propria*
- Sub mucosa
- Cartilage &muscle layer
- Adventitia

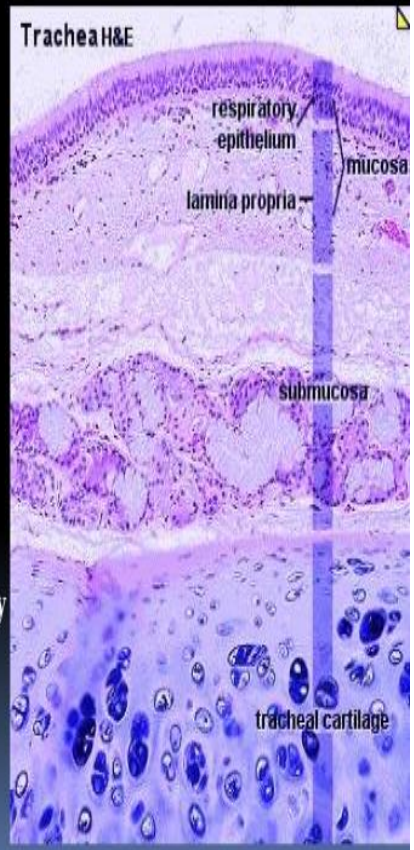


Trachea wall layers



Trachea

- Sub mucosa-
- Loose connective tissue
- Tracheal glands-Mixed (serous &mucus) glands
- Blood vessels and ducts
- Cartilage &smooth muscle layer-
- "C" Shaped hyaline cartilage having perichondrium and chondrocytes
- Ends of cartilage connected by smooth muscles
- Adventitia-fibro elastic tissue



Bronchi

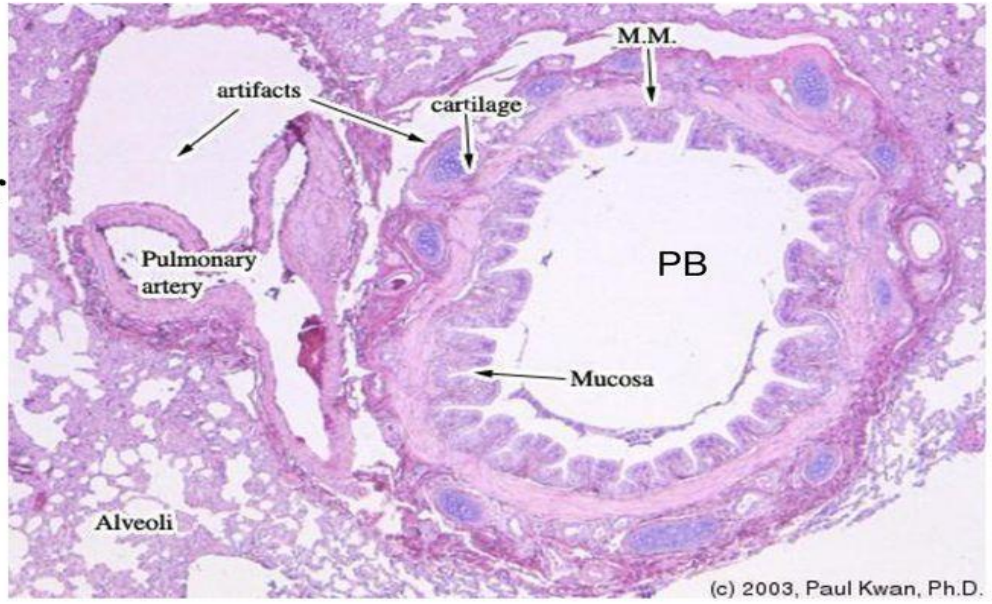
- **Extrapulmonary bronchi**: resemble to Trachea in structure (contain hyaline cartilage) include
- Primary bronchi
- Secondary bronchi except right middle lobe bronchus
- **Intrapulmonary bronchi include:**
- Secondary bronchi right middle lobe bronchus
- Tertiary bronchi
- bronchioles

Extrapulmonary bronchi

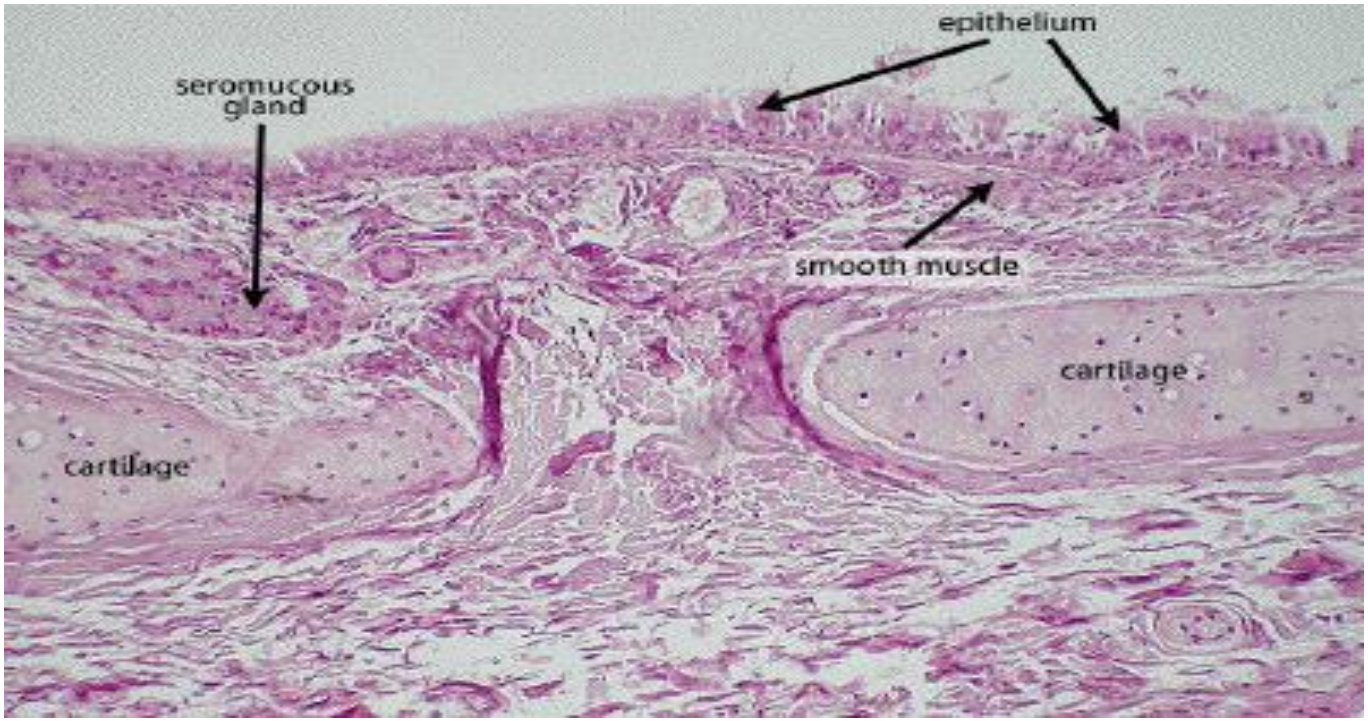
Primary Bronchi (Extrapulmonary)

- Primary bronchi is identical to trachea, but have smaller diameter and thinner wall

- Cartilage is in form of irregular plates
- Smooth muscle located between lamina propria and submucosa as 2 distinct layers



Extrapulmonary bronchi layers



Intrapulmonary bronchi

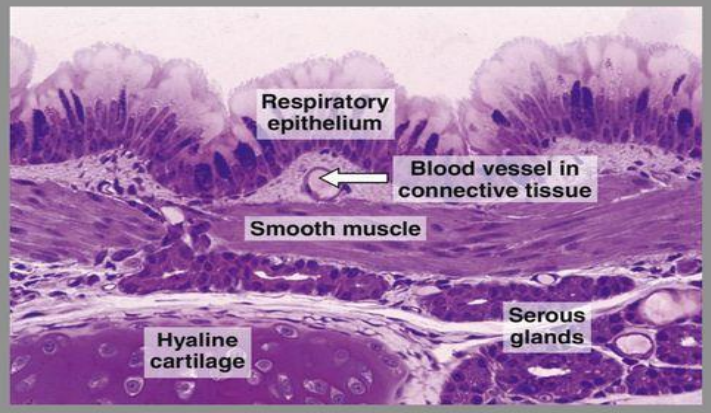
INTRAPULMONARY BRONCHUS

(1) Mucosa:

a- Epithelium: Respiratory epith.

b- Lamina propria.

N.B. No elastic lamina.



(2) Muscle coat (complete):

Two distinct layers of smooth muscle fibers spirally arranged in opposite direction.

Intrapulmonary bronchi

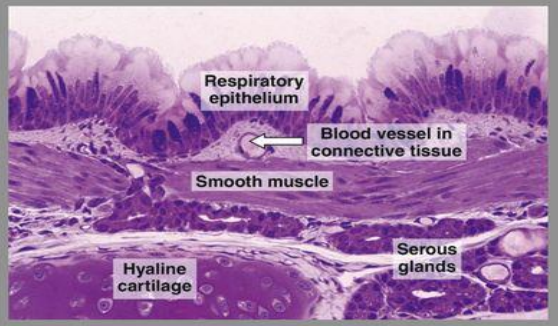
INTRAPULMONARY BRONCHUS

(3) Submucosa:

C.T. contains:

a- Seromucous glands.

b- Lymphoid elements.

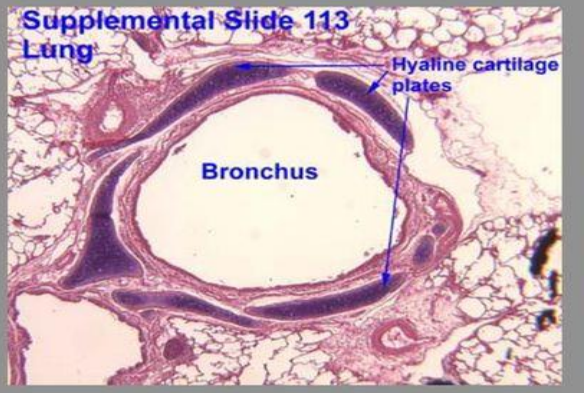


(4) Adventitia:

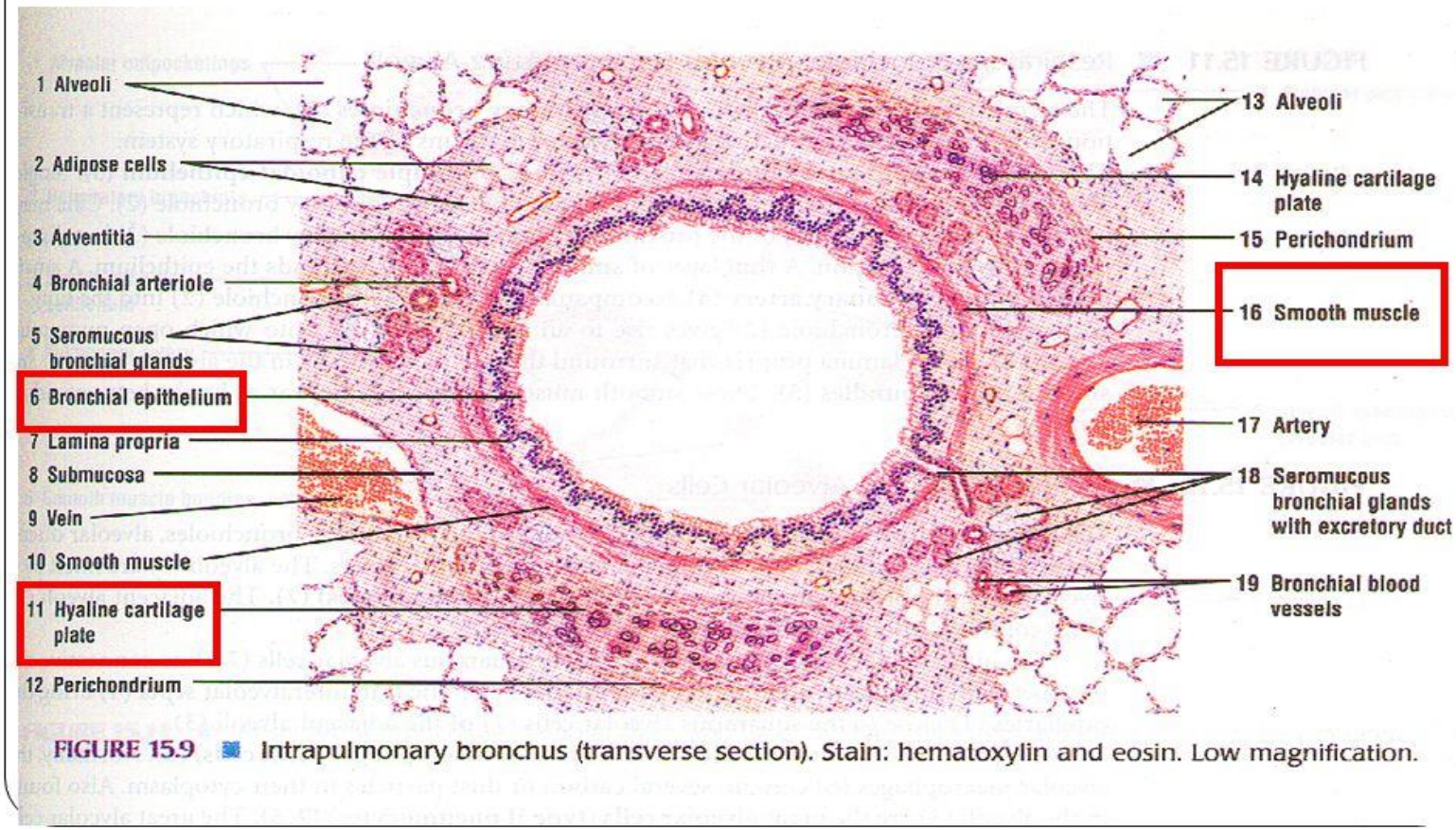
Contents: a- Loose C.T.

b- Irregular plates of hyaline cartilage (complete layer).

c- Solitary lymphoid nodules.



Intrapulmonary bronchi



Intrapulmonary bronchi

- Clara cells in bronchiole wall

CLARA CELLS

Structure:

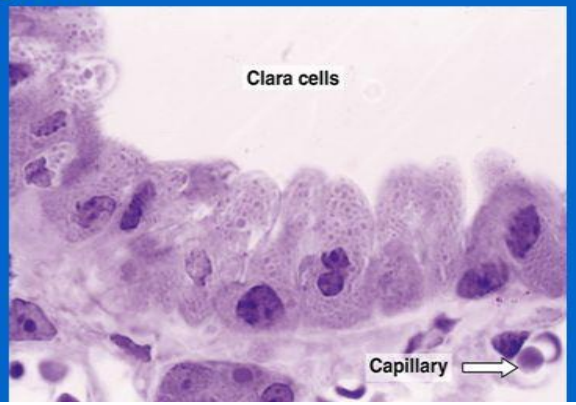
columnar cells (non ciliated).

Function:

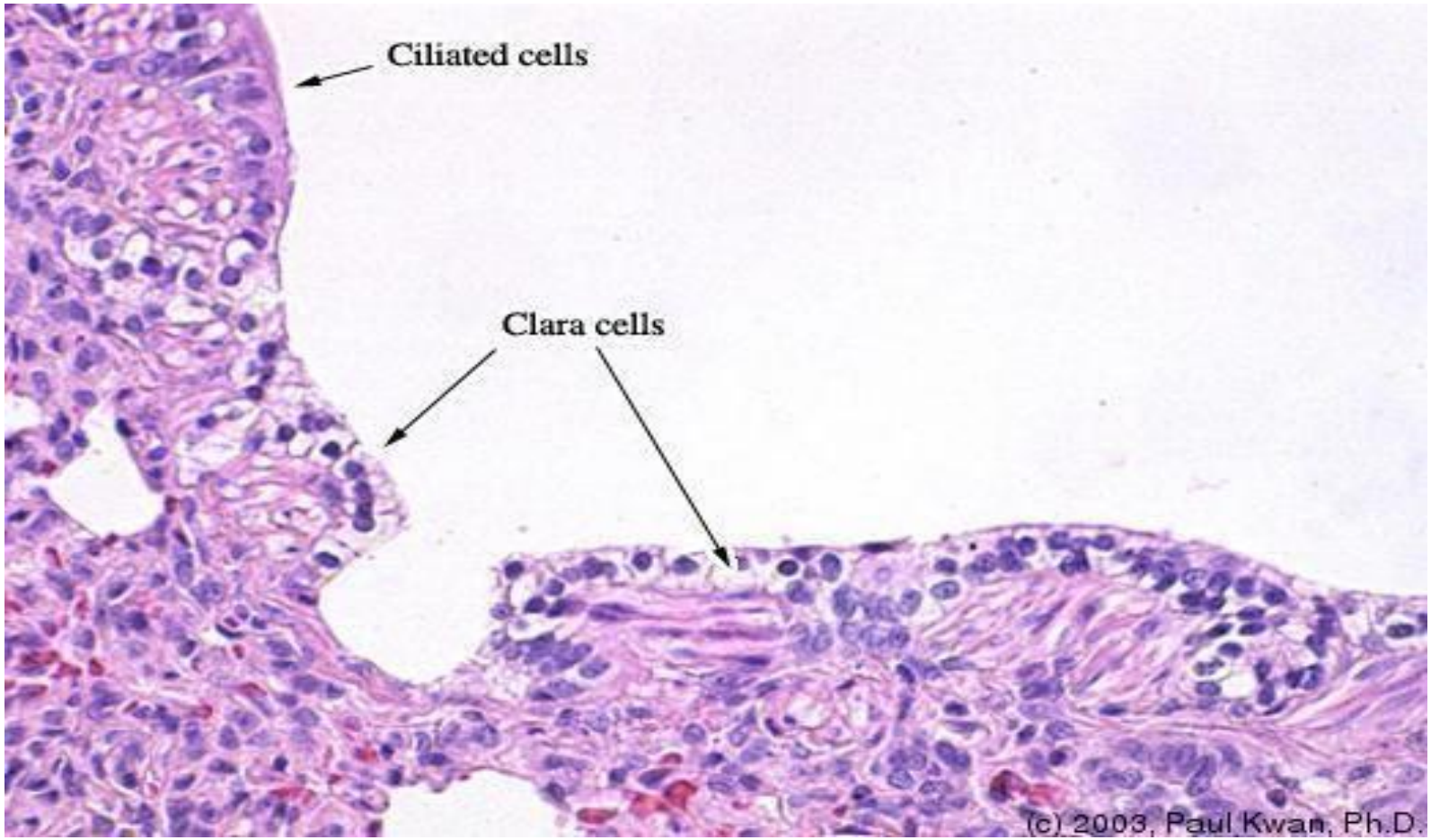
1- Degrade toxins in inhaled air.

2- Divide to regenerate the bronchiolar epith.

3- Produce surfactant-like material.

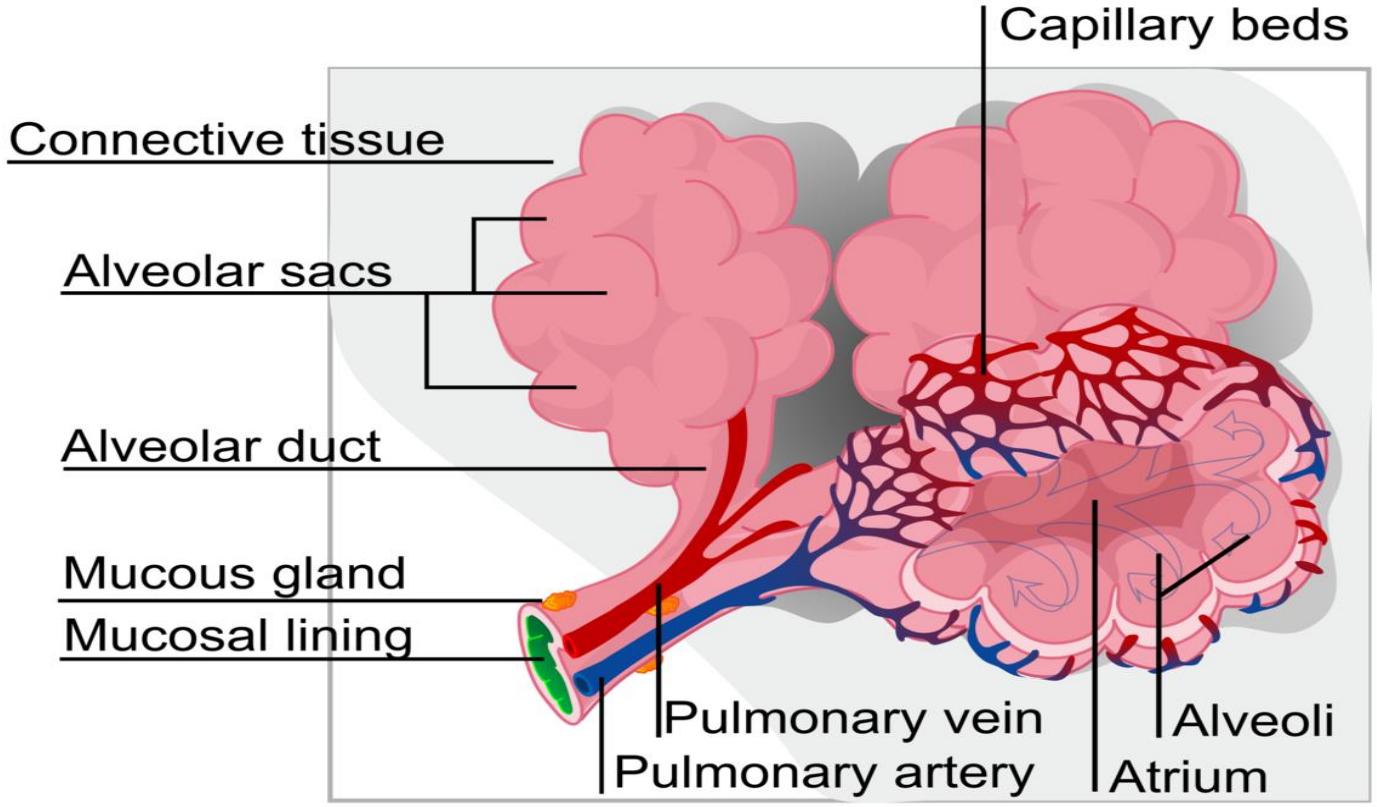


Intrapulmonary bronchi

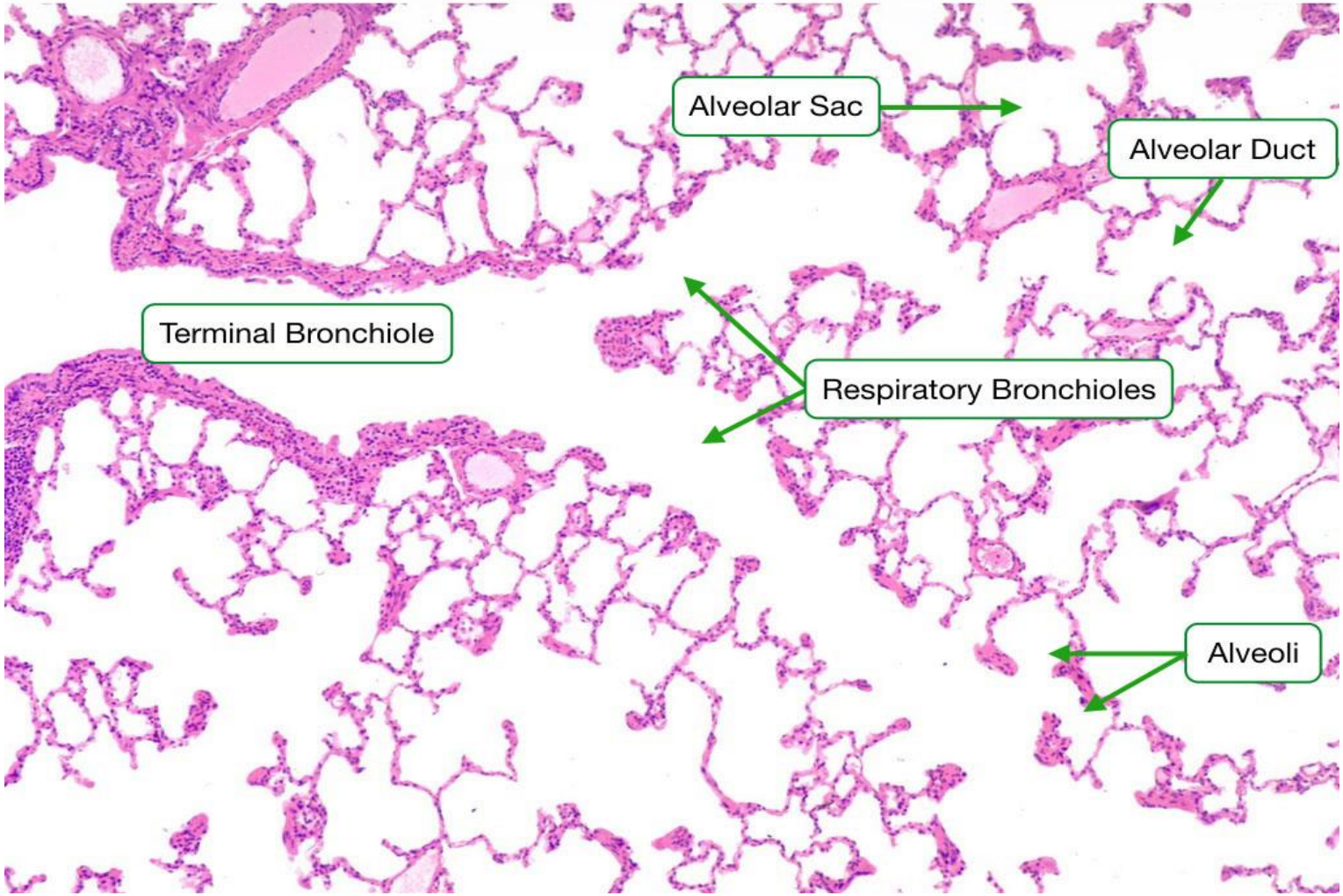


Intrapulmonary bronchi

- Alveoli



Alveoli

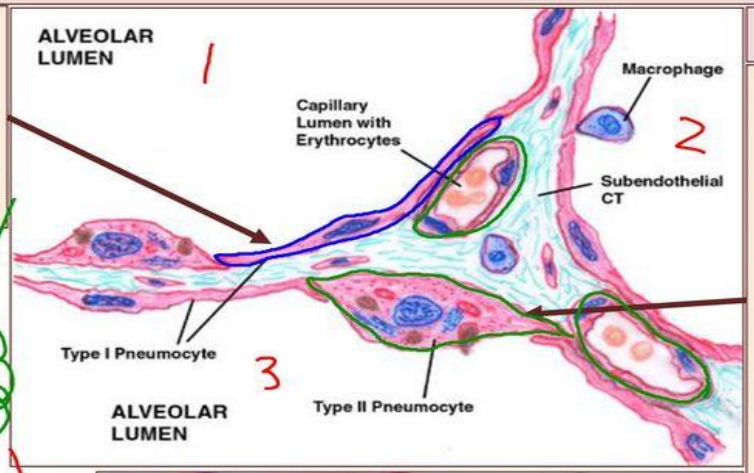

Alveolar Sac
Alveolar Duct
Terminal Bronchiole
Respiratory Bronchioles
Alveoli

Alveoli

Transport across the alveolar membrane is assisted by two different types of cells, known as pneumocytes.

Type I Pneumocytes

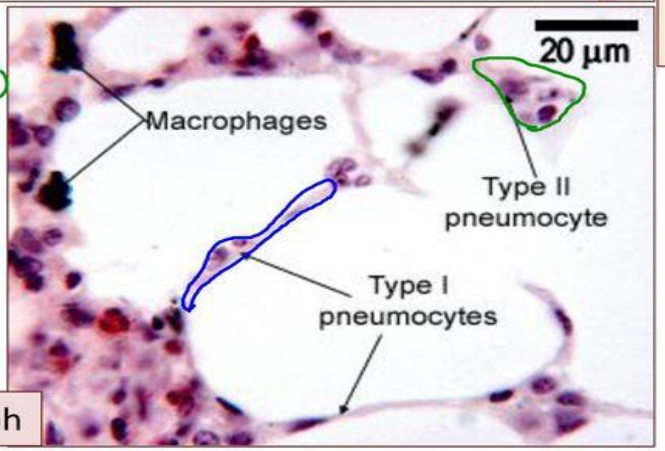
Extremely Thin, Adapted to carry out gas exchange



Diagram

Type II Pneumocytes

Secrete a solution containing surfactant that creates a moist environment to prevent the sides of the alveolus to adhere to each other by reducing surface tension.



Light Micrograph

End

- Thanks a lot for attention

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- 2020-2021