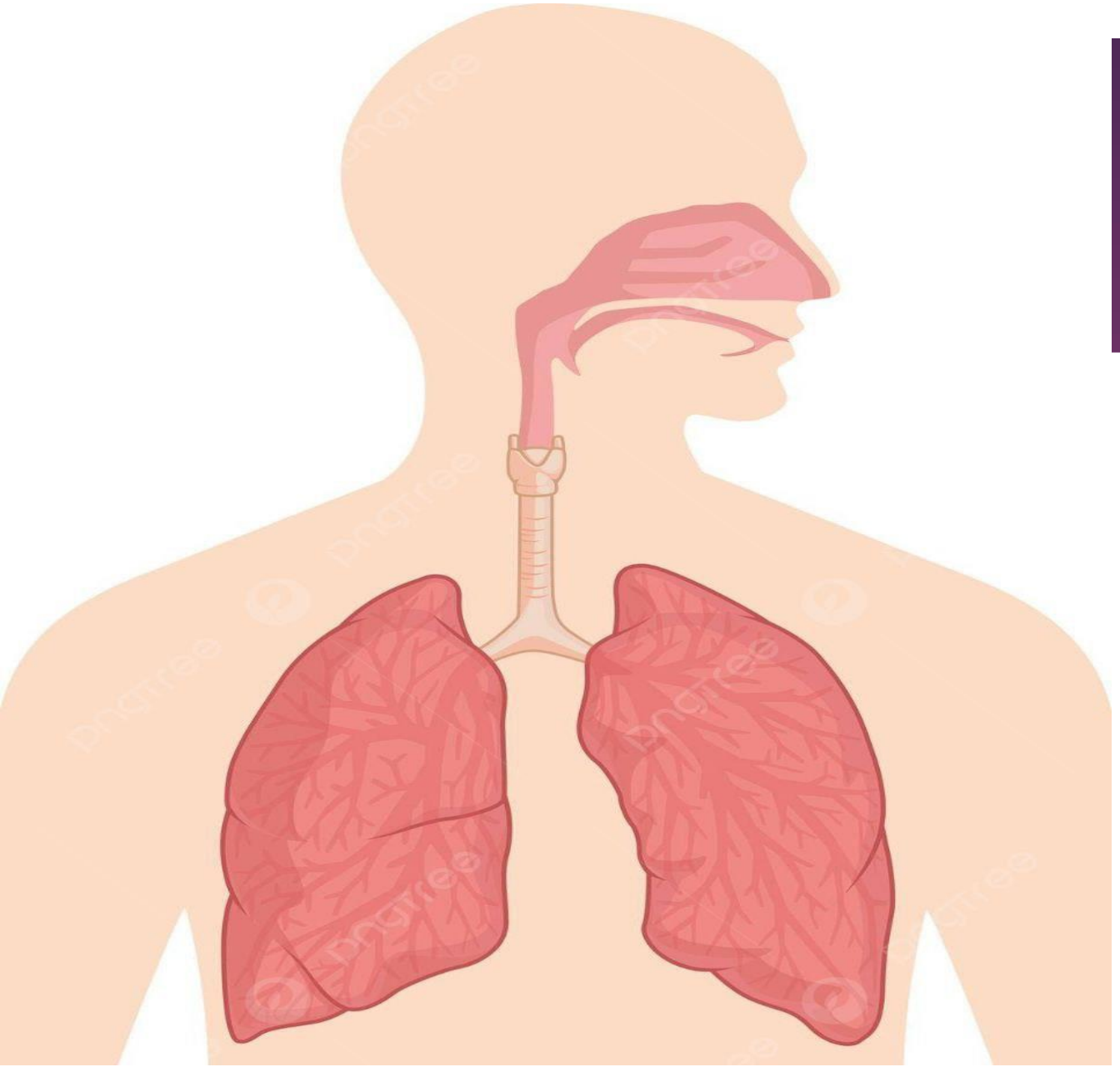


Medical Histology Laboratory

lab 2- 1st class

The Respiratory System

By

Lecturer

Reham Hassan

The Respiratory System

– The respiratory system , comprising the lungs and a sequence of airways leading to the external environment, functions in providing oxygen (O2) to and eliminating carbon dioxide (CO2) from the cells of the body.

The Respiratory System

is subdivided into:

1- conducting portions

2- respiratory portions

Conducting portion Parts:

nasal cavity, pharynx, larynx, trachea, primary bronchi, secondary (lobar) bronchi, tertiary (segmental) bronchi, and terminal bronchioles.

functions :

clean, warm and moisten air prior to reaching respiratory portion

Helpes regulate blood PH

2- respiratory region

consisting of respiratory bronchioles , alveolar ducts and alveoli.
That lining of pseudostratified epithelial tissue resting on areolar connective tissue rich in blood vessels and serous mucous gland
(respiratory epithelium)

Most of the nasal cavities and conducting portion of the system is lined with mucosa having ciliated pseudostratified columnar epithelium is known respiratory epithelium.

This epithelium has five major cell type:

Ciliated columnar cells, Brush cells, Basal cells, Small granule cells, Goblet cells.

t

3- Olfactory region

Lining by pseudostratified columnar epithelium tissue
Olfactory epithelium comprises three types of cells:

Olfactory cells

Sustentacular(supporting) cells

Basal cells

But The larynx

is lined by pseudostratified epithelium tissue.

Trachea

is a tube that connect the pharynx and larynx to the lung, allowing the passage of air . the trachea has three layers: mucosa, sub mucosa and adventitia.

The tissue lining is psedostratified ciliated columnar epithelium tissue .

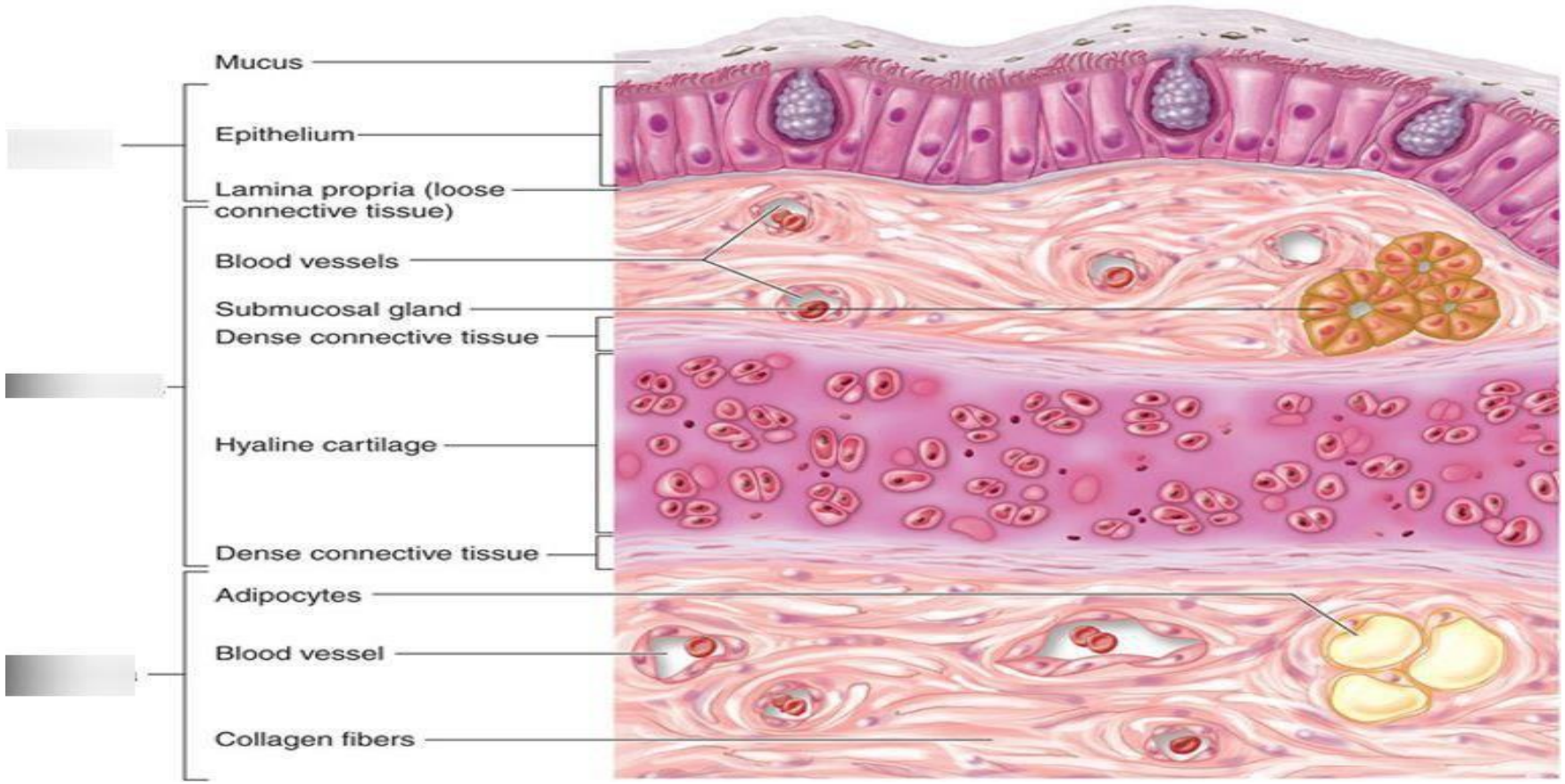
Trachea layers

1- **Mucosa**, composed of pseudostratified ciliated columnar epithelium that based on loose connective tissue and presence of goblet cells .

2- **Submucosa**, composed of dense irregular connective tissue housing numerous blood vessels, mucous and seromucous glands.

3- **Adventitia**, the thickest layer in the tracheal wall and composed of c-ring of hyaline cartilage.

trachea


Mucus
Epithelium
Lamina propria (loose connective tissue)
Blood vessels
Submucosal gland
Dense connective tissue
Hyaline cartilage
Dense connective tissue
Adipocytes
Blood vessel
Collagen fibers

Respiratory bronchioles

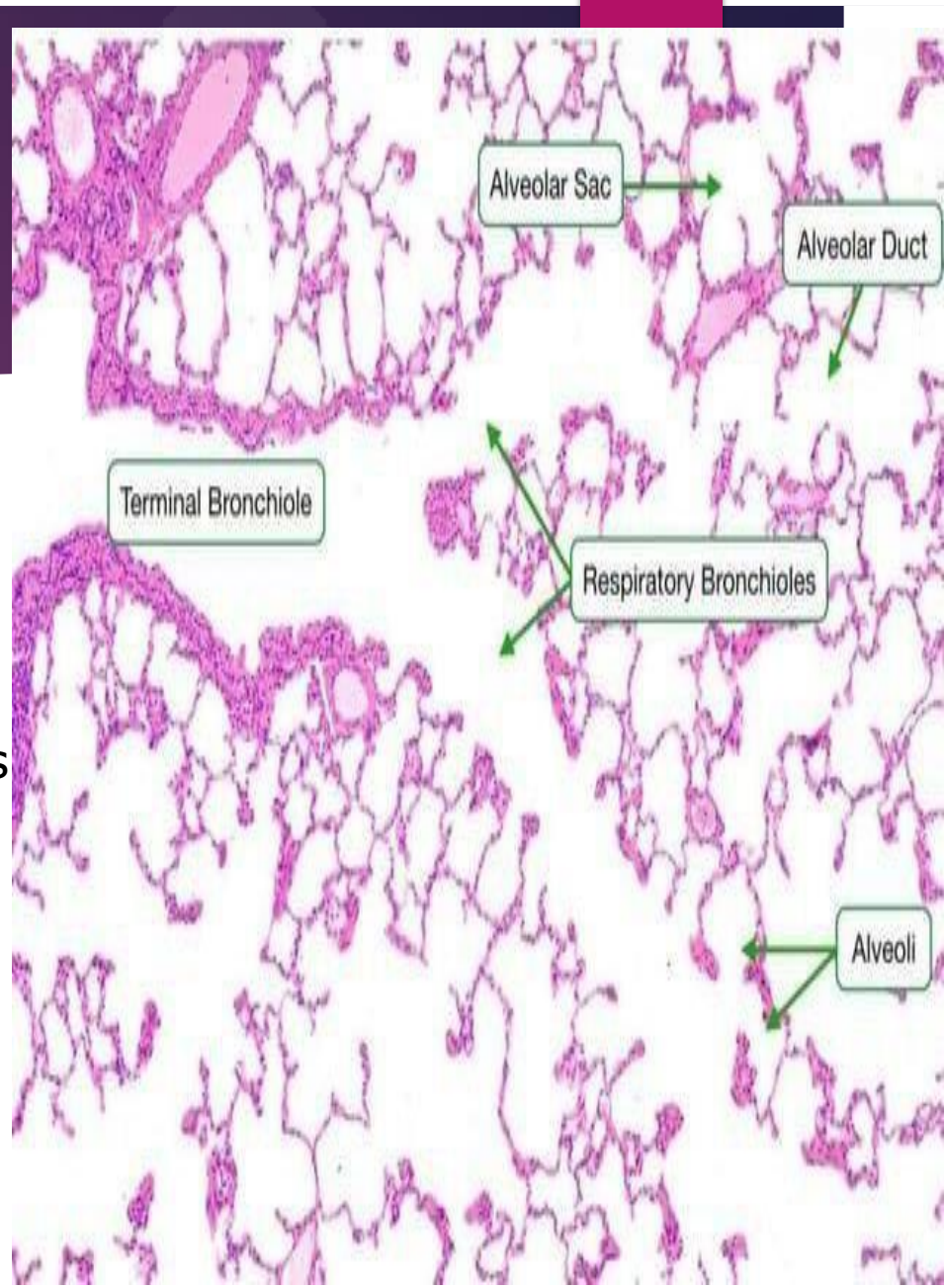
The wall of respiratory portion lined by simple cuboidal epihelim tissue that turns to simple squamous epithelium tissue and smooth muscles.

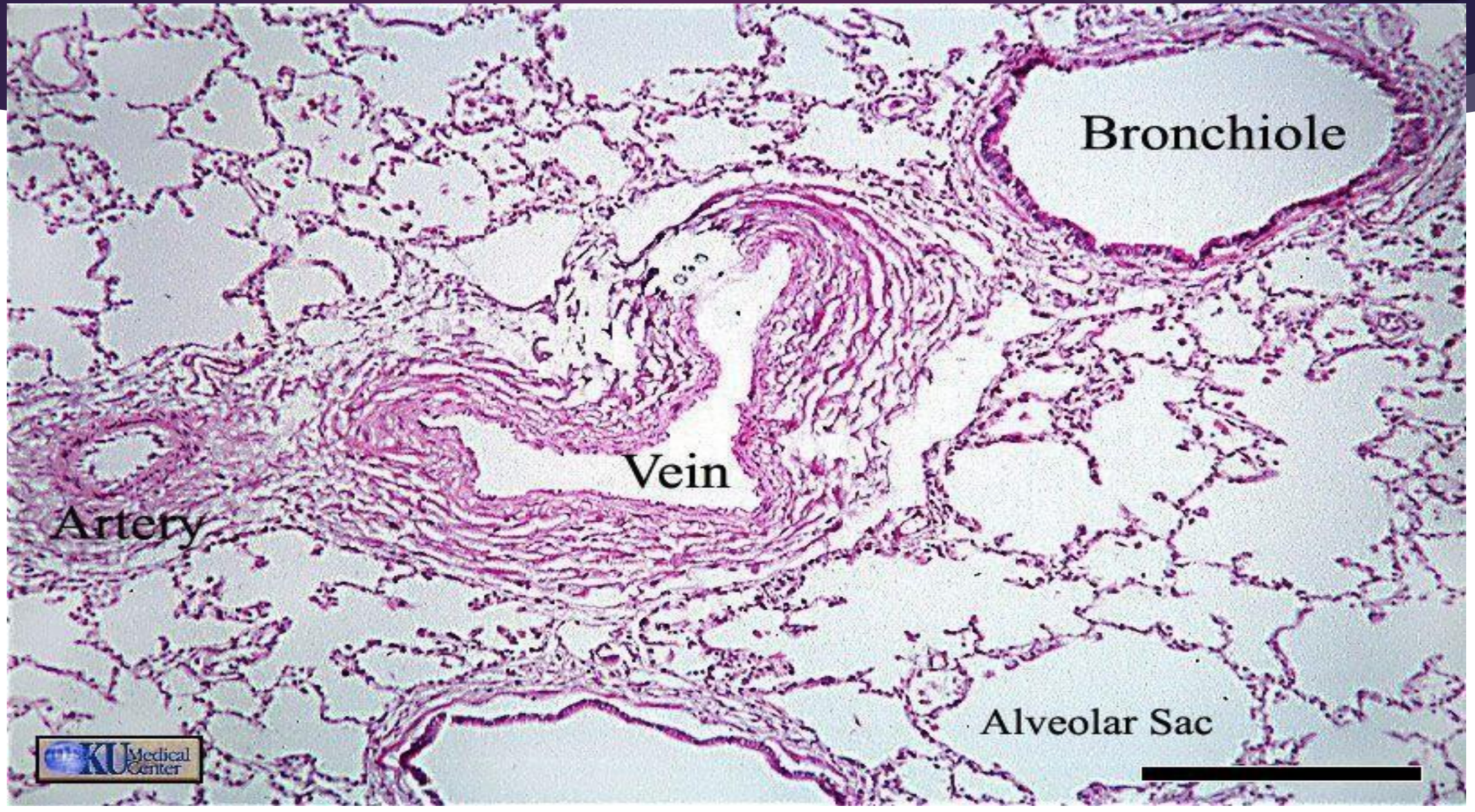
composed of alveolar ducts, alveolar sacs and alveoli.

alveolar ducts called of distal ends of respiratory branch into tubes

alveolar sacs they are cyst shaped clusters that meet around a common air space & are lined by simple squamous tissue.

Alveoli are saclike evaginations ,resulting from a gather alveolar sac and alveolar duct




Bronchiole
Vein
Artery
Alveolar Sac
KU Medical Center

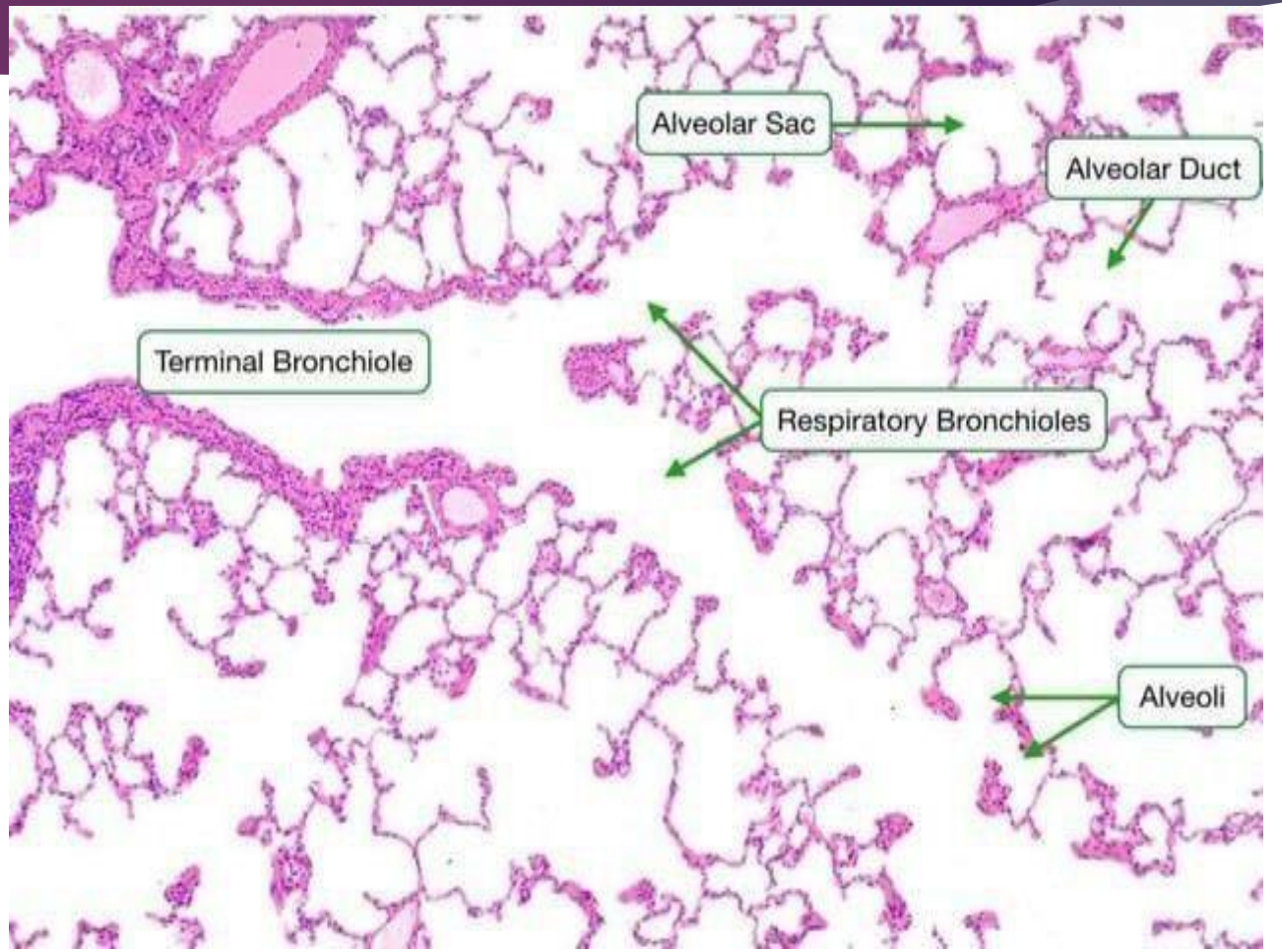
lungs

- The lung is structurally divided into two parts: the airways and the air filled sacs
- The airways are lined by psedostratified ciliated columnar epithelia tissues ,cartilage and goblet cells.


1 Adventitia
2 Submucosa
3 Smooth muscle
4 Lamina propria
5 Intrapulmonary bronchus
6 Bronchial glands with excretory duct
7 Hyaline cartilage plates
8 Terminal bronchiole
9 Pulmonary vein and artery
10 Terminal bronchiole with mucosal folds
11 Smooth muscle
12 Respiratory bronchiole with alveoli
13 Alveolar ducts
14 Serosa:
a. Connective tissue
b. Mesothelium
15 Lymphatic nodule and vein
16 Adventitia
17 Bronchiole
18 Mucosal folds
19 Smooth muscle
20 Alveolar ducts
21 Blood vessels
22 Respiratory bronchiole
23 Alveoli opening into alveolar duct
24 Alveolar sacs
25 Trabecula with blood vessels

What are the 3 cells types in the lungs

- epithelial cells
- Alveolar cells
- Bronchial cells



Why are lungs spongy?

The lungs are soft and spongy because

They are mostly air spaces surrounded by the alveolar cells and elastic connective tissue