



CLARA CELLS

Structure:

columnar cells (non ciliated).
Dome-shaped apices with microvilli.
Numerous apical secretory granules (of glycoproteins).
Abundant rER.

Function:

- 1- Protect the bronchiolar epith. by their glycoproteins secretion.
- 2- Degrade toxins in inhaled air.
- 3- Divide to regenerate the bronchiolar epith.
- 4- Produce surfactant-like material.

ALVEOLAR DUCTS

The wall of alveolar ducts consist almost of pulmonary alveoli.
Alveolar ducts do NOT have walls of their own;
They are merely linear arrangement of pulmonary alveoli.

N.B. Alveolar duct → ends by: atrium → communicates with: 2-3 alveolar sacs

INTERALVEOLAR

Definition:

The region between 2 adjacent alveoli.

Components:

(A) Alveolar Epithelium:

lines both sides of interalveolar septum.

(B) Interstitium.

ALVEOLAR EPITHELIUM

(1) Type I Pneumocytes:

- line **95% of the alveolar surface**.
 - **Count:** less numerous than type II pneumocytes.
 - **L/M:** simple squamous epith. ,highly attenuated cells.
 - **E/M:** Abundant pinocytotic vesicles, Are connected together and with type II cells by occluding junctions.
- Function:**
Exchange of gases.

(2) Type II Pneumocytes:

- Line **5% of the alveolar surfaces**.
- Are **more numerous** than type I pneumocytes.
- **L/M:**
Are **cuboidal cells** (other textbooks: rounded cells).
Usually found in groups of 2-3 cells.
Usually found at sites of union of septa.
- **Foamy or vesicular cytoplasm.**
Nucleus: central, rounded, vesicular.
- **E/M:**
connected with type I cells by occluding junctions
Dome-shaped apical surface.
Short apical microvilli.
Abundant mitochondria, RER , Well-developed Golgi.
Membrane-bound **Lamellar bodies** (contain concentric or parallel lamellae limited by a unit membrane) (contain pulmonary surfactant).

Function:

- 1- Synthesis & secretion of **pulmonary surfactant:**
 - a- It reduces effort to inflate pulm. Alveoli.
 - b- It has bactericidal effect.
- 2- Phagocytosis of pulmonary surfactant.
- 3-Renewal of alveolar epithelial cells:
Type II cells can divide to regenerate both type I & type II pneumocytes.

Alveolar Macrophages (Dust Cells)

Sites:

- (1) In lumen of pulmonary alveoli.
- (2) In pulmonary interstitium.

Function:

- 1- Phagocytose particulate matter (e.g. dust & bacteria) in the lumen of pulm. alveoli & in the interalveolar septa.
- 2- Phagocytose part of the surfactant

Interstitium of interalveolar

(1) Continuous Pulmonary Capillaries:

- The richest capillary network in the body
- Continuous blood capillaries
- Endothelium shows numerous pinocytotic vesicles.

(2) Interstitial C.T.:

- a- C.T. Fibers: elastic fibers & type III collagen (reticular fibers).
- b- C.T. Cells: Fibroblasts, Macrophages, Mast cells, Lymphocytes.

PULMONARY ALVEOLI

Definition:

They are small outpouchings of respiratory bronchioles, alveolar ducts & alveolar sacs.

Topics:

- * Interalveolar septa.
- * Blood-air barrier (Blood-gas barrier)
- * Alveolar epithelium.
- * Lung macrophages (alveolar macrophages).