

Respiratory system

刘佳梅

Components

nose

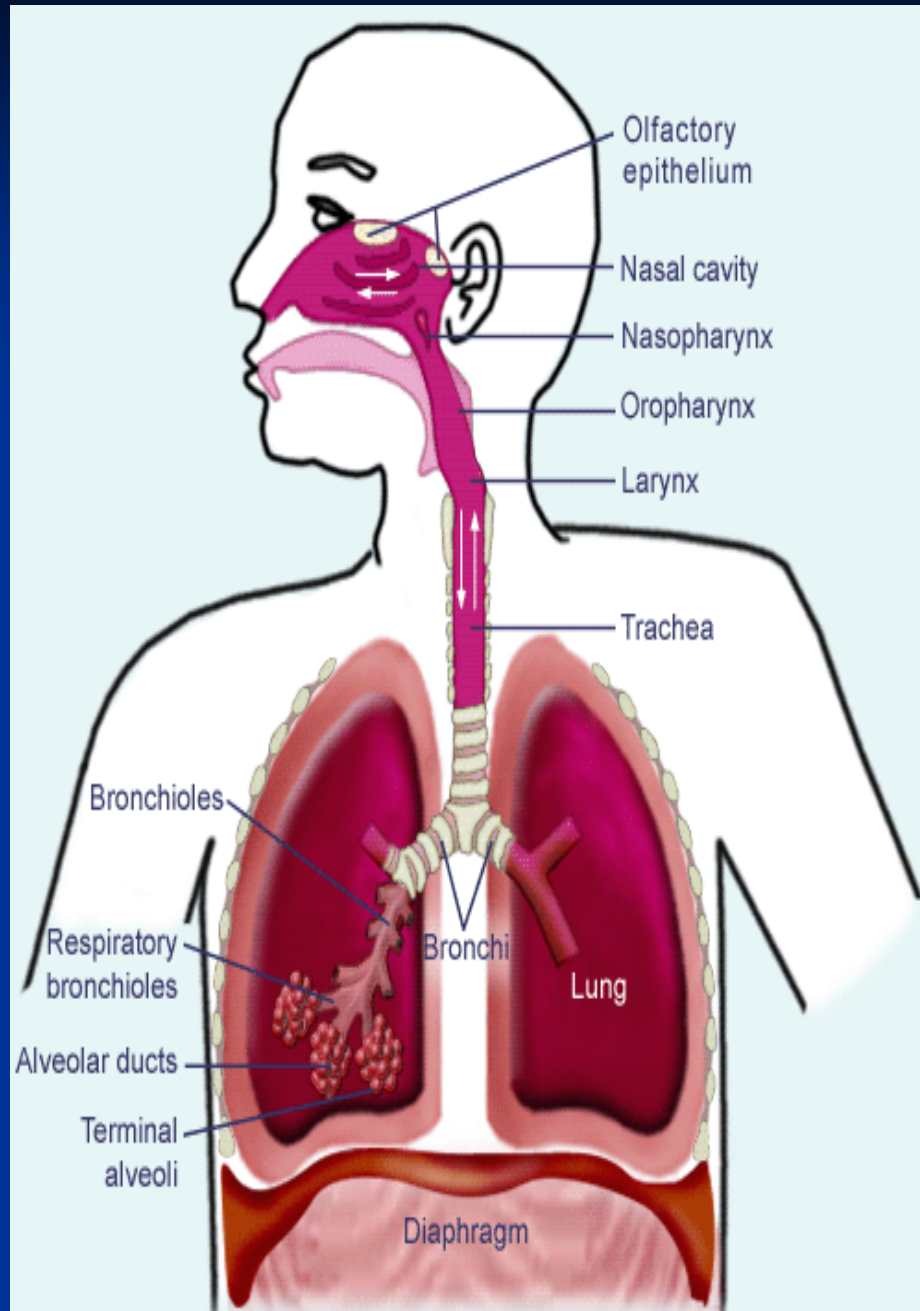
pharynx

larynx

trachea

bronchus

lung



Nasal cavity

1. Vestibular Region:

2. Respiratory Region:

3. Olfactory Region:

(1) olfactory epithelium:

pseudostratified ciliated columnar epithelium

A. supporting cells

B. olfactory cells

C. basal cells

(2) Lamina Propria:

olfactory glands (serous type)

Trachea and Bronchus

- 1. Mucosa:**
- 2. Submucosa:** tracheal glands
- 3. Adventitia** C- shaped rings of hyaline cartilage



MUCOSA

SUBMUCOSA

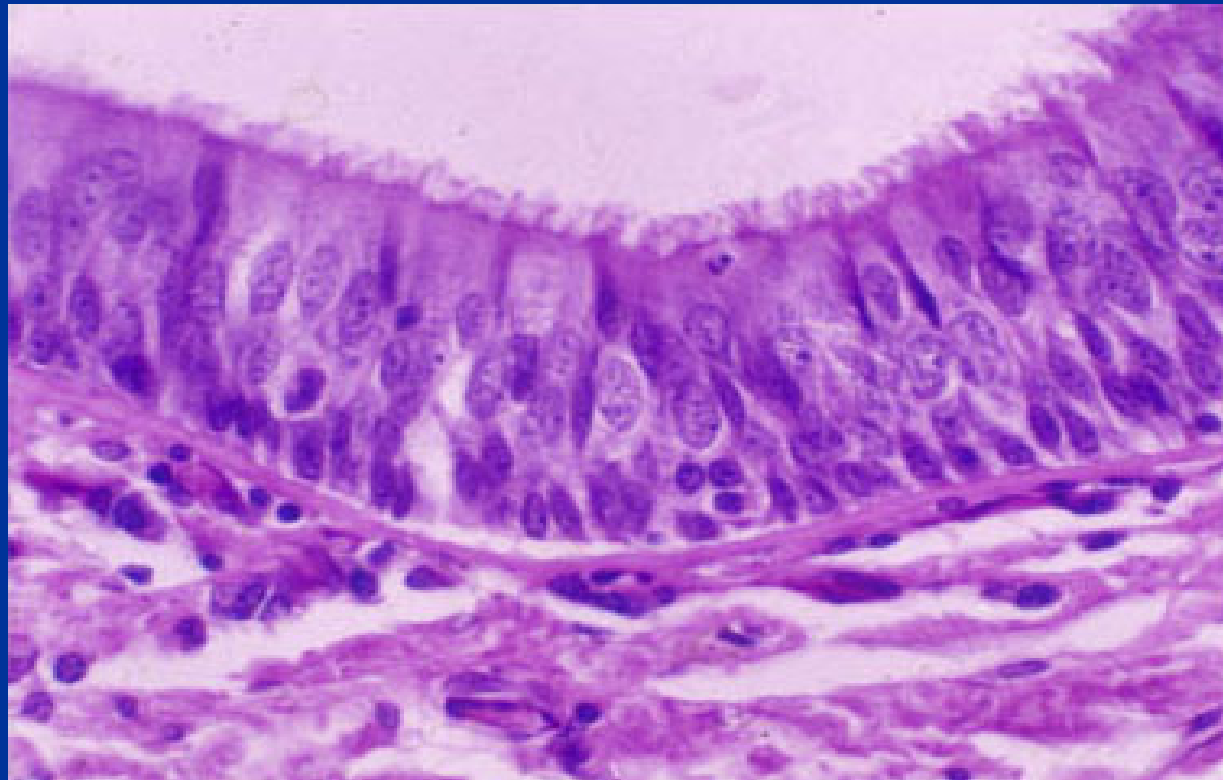
ADVENTITIA

Mucosa:

Epithelium: Pseudostratified ciliated columnar epith

- (1) ciliated cells
- (2) goblet cells
- (3) basal cells
- (4) brush cells
- (5) diffuse neuroendocrine cells

Lamina Propria: thick basement membrane

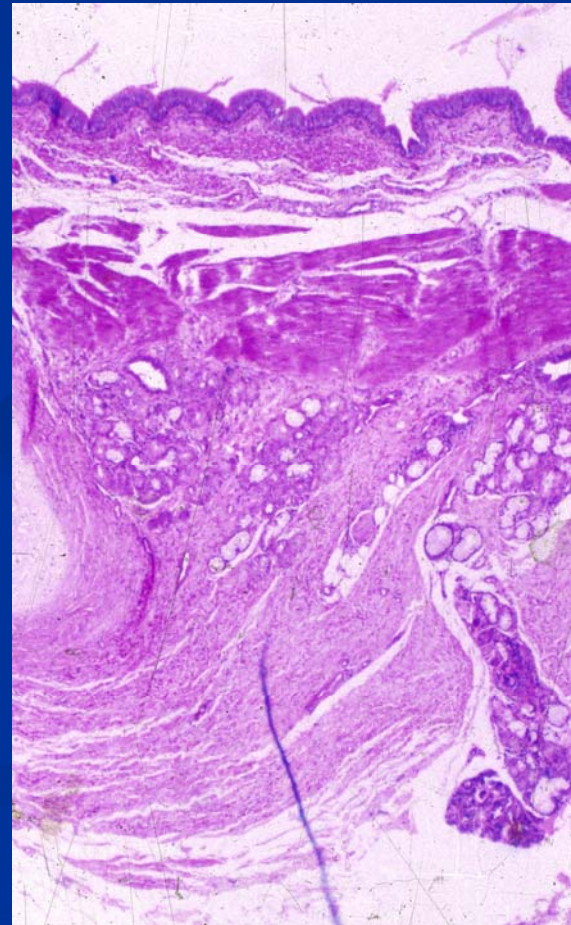
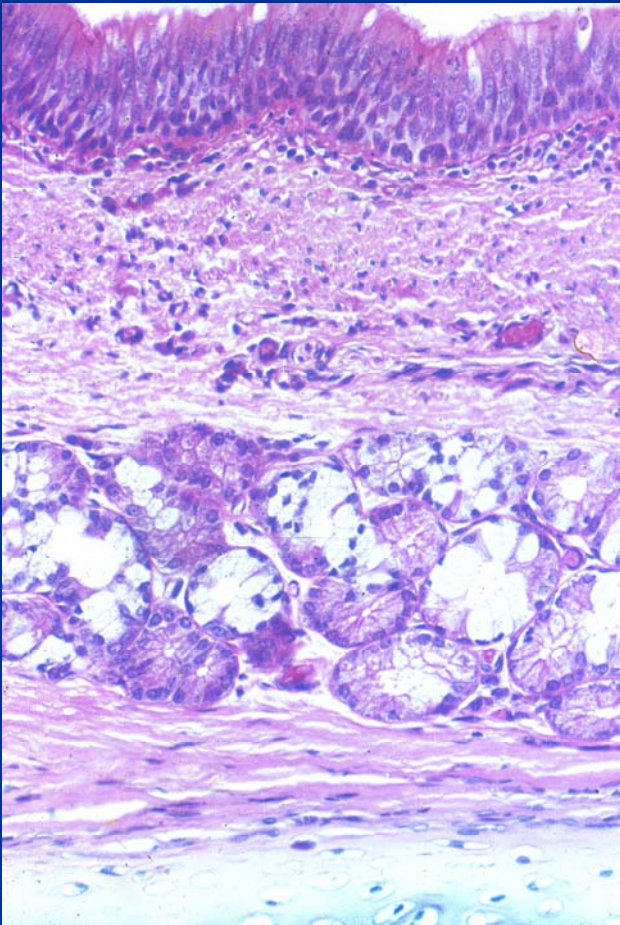


Submucosa: tracheal glands

Advantitia

hyaline cartilage portion:

membrane portion:



Lung

serosa

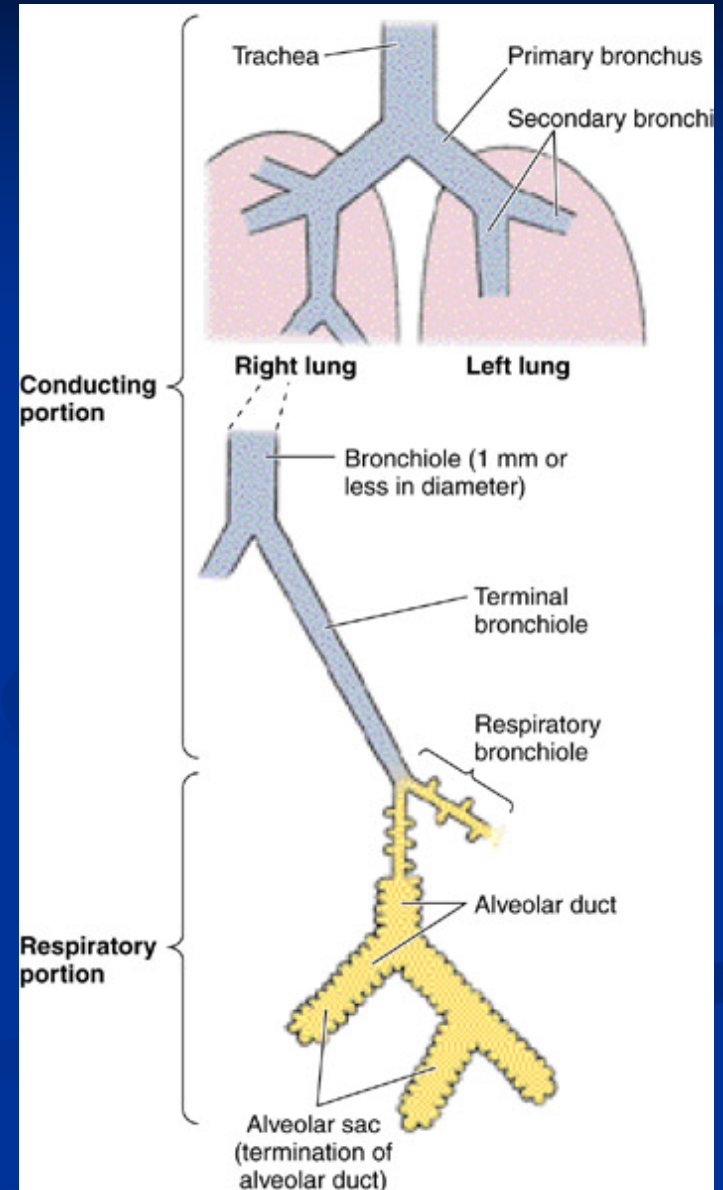
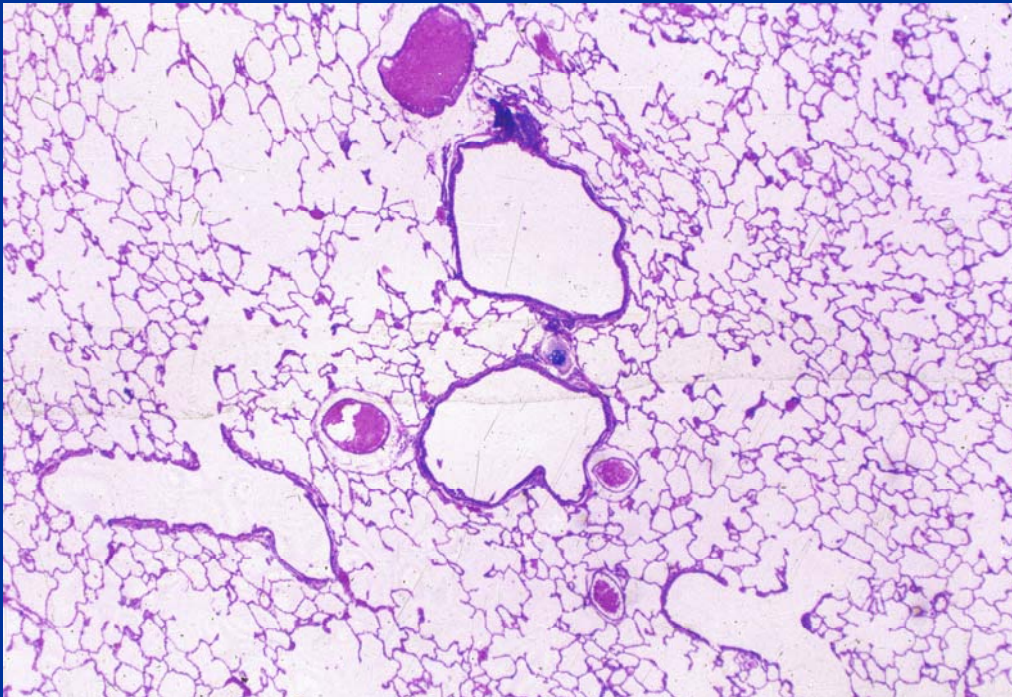
Parenchyma Interstitium

Pulmonary Conducting Portion

Pulmonary Respiratory Portion

bronchial tree

pulmonary lobule

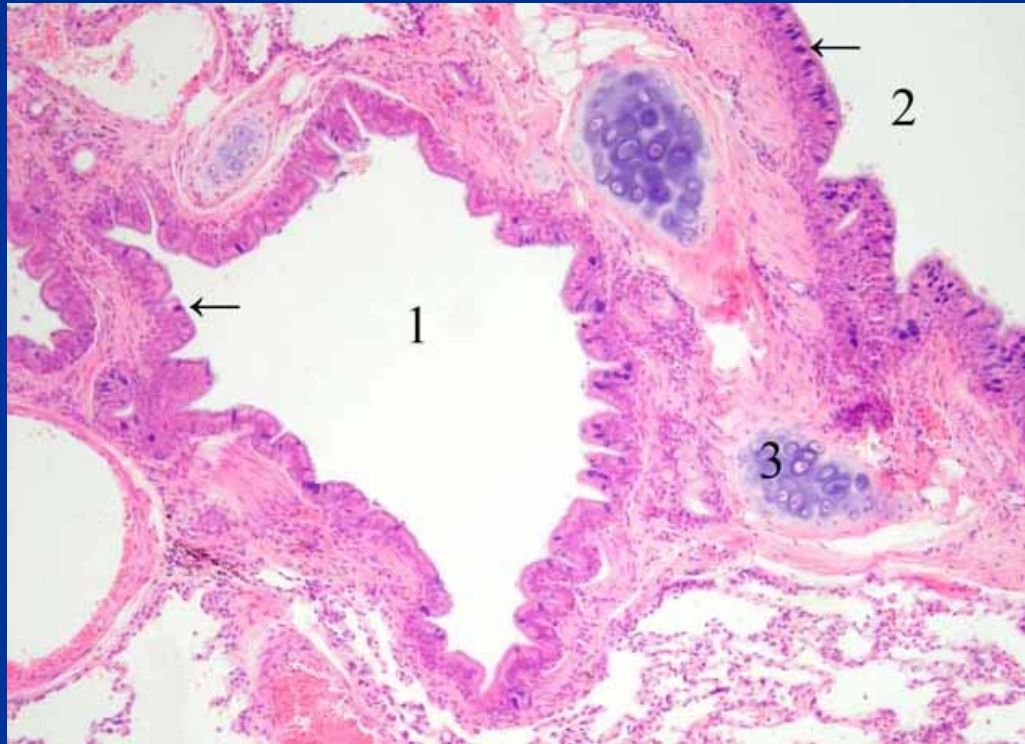


Pulmonary Conducting Portion

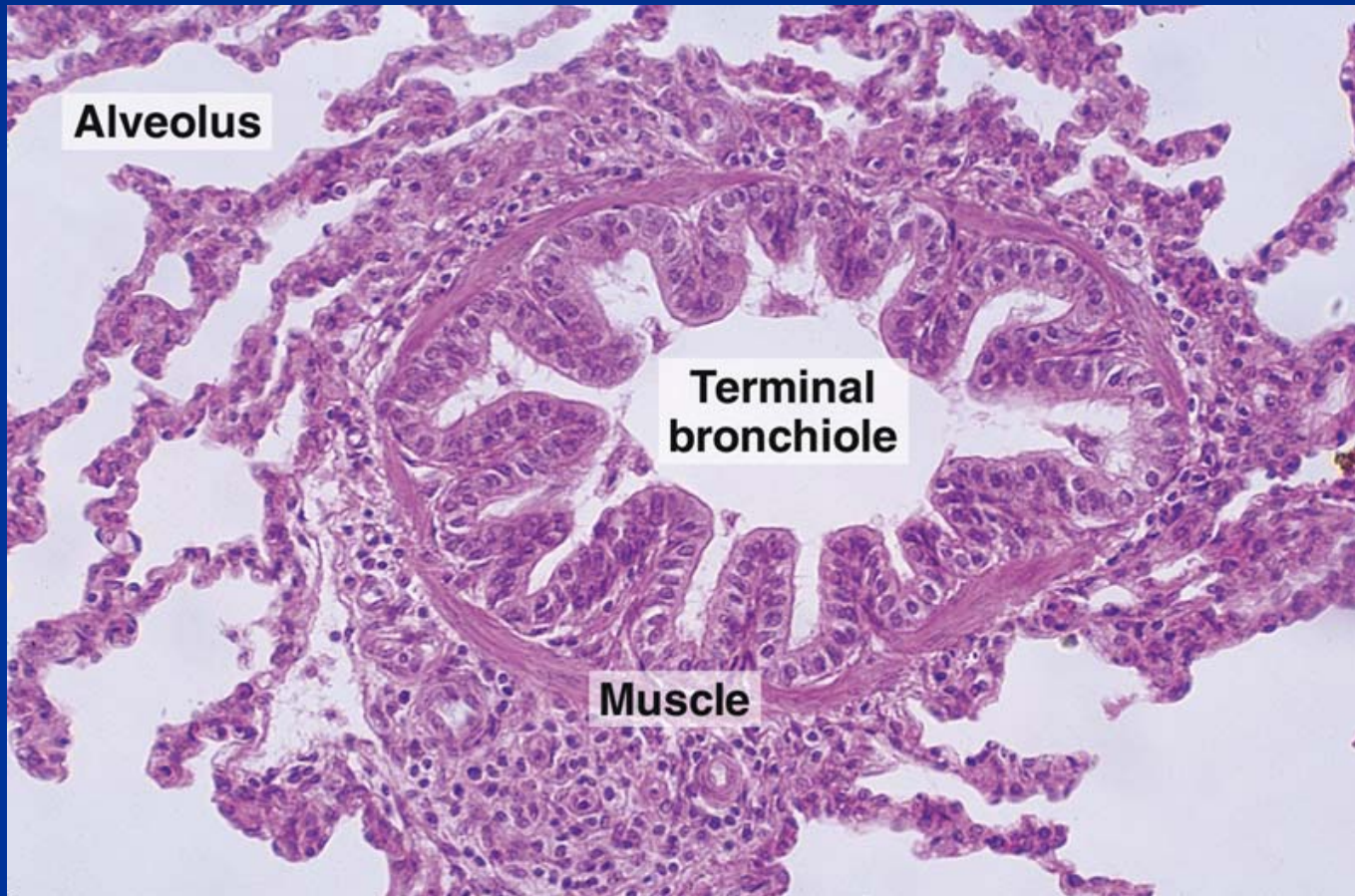
1. Lobar bronchi to small bronchi

- ① The epithelium changes from higher to lower; decrease of goblet cells
- ② Less numerous bunches of smooth muscle cells in the outer of lamina propria
- ③ Gradual decrease of tracheal glands
- ④ The cartilage changes for pieces of cartilage

2. Bronchiole:



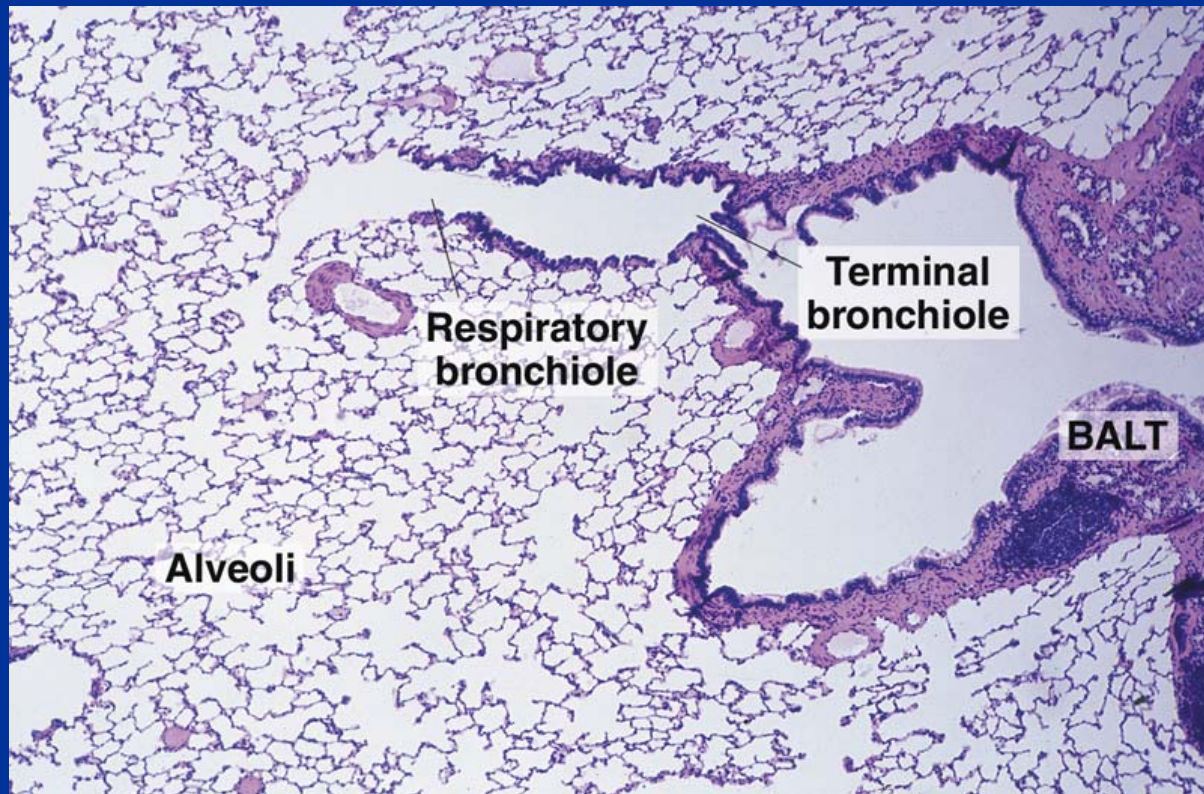
3. terminal bronchiole simple columnar ciliated epithelium



Pulmonary Respiratory Portion

1. respiratory bronchioles:

the lumen with openings of pulmonary alveoli

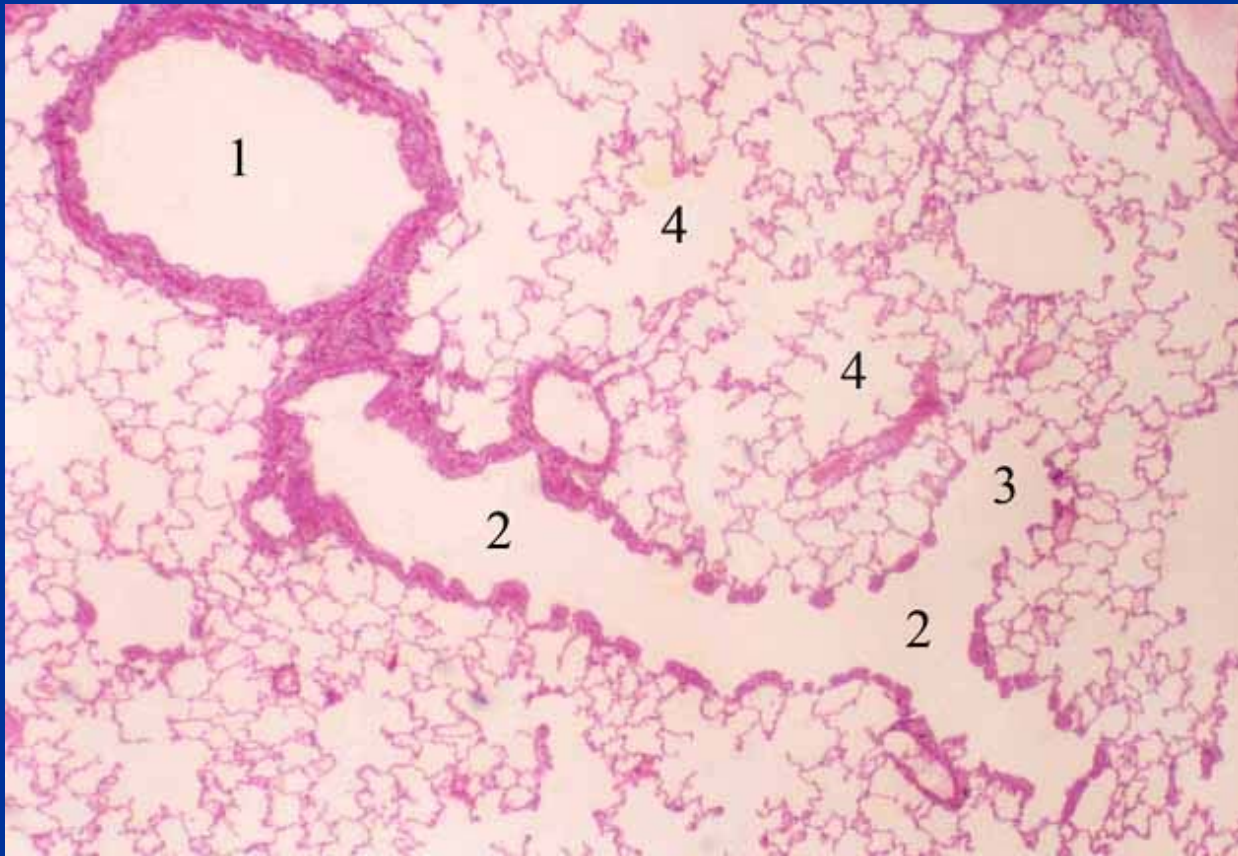


2. alveolar ducts:

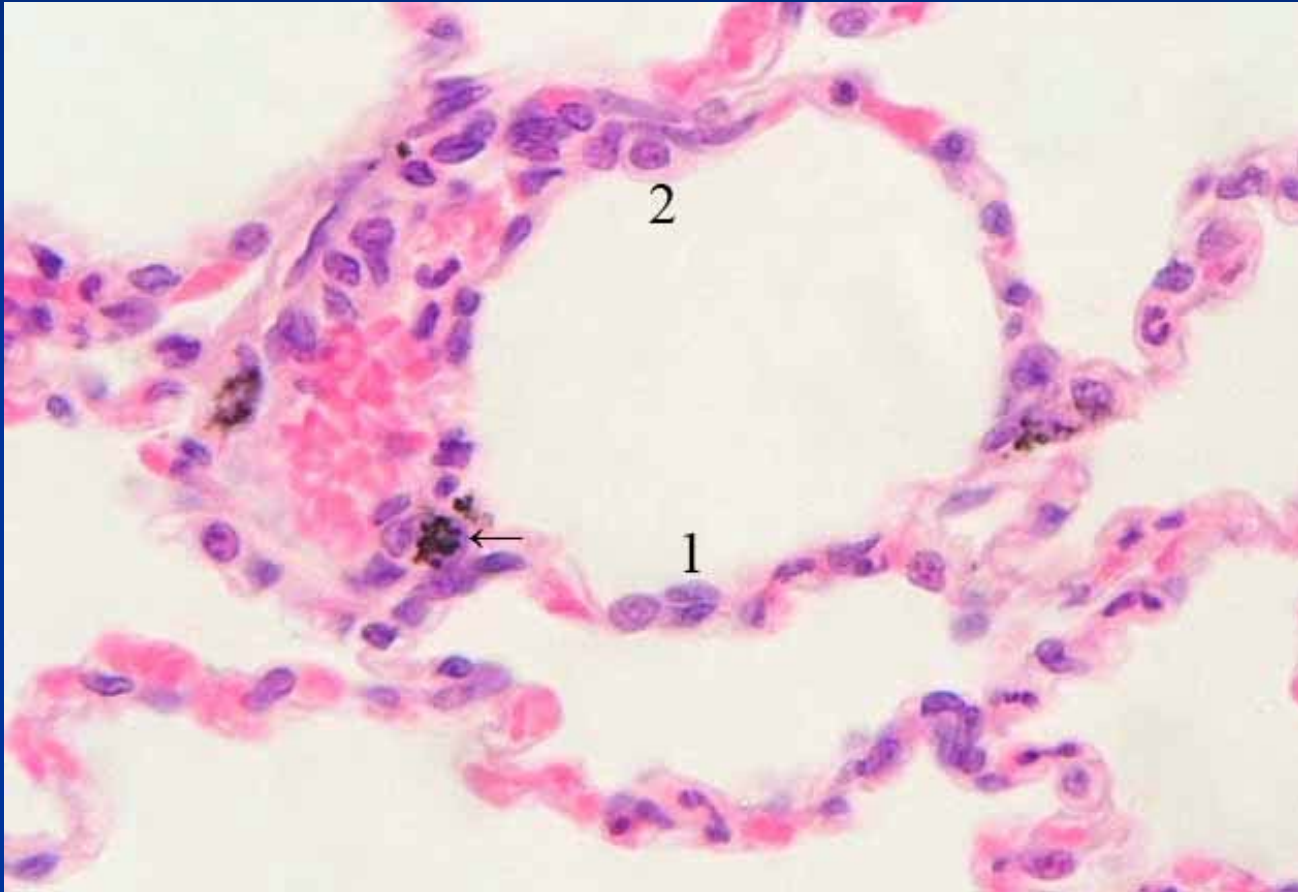
surrounded by the rim the alveoli, having knobs between adjacent alveoli

3. alveolar sacs:

the site of common openings of pulmonary alveoli



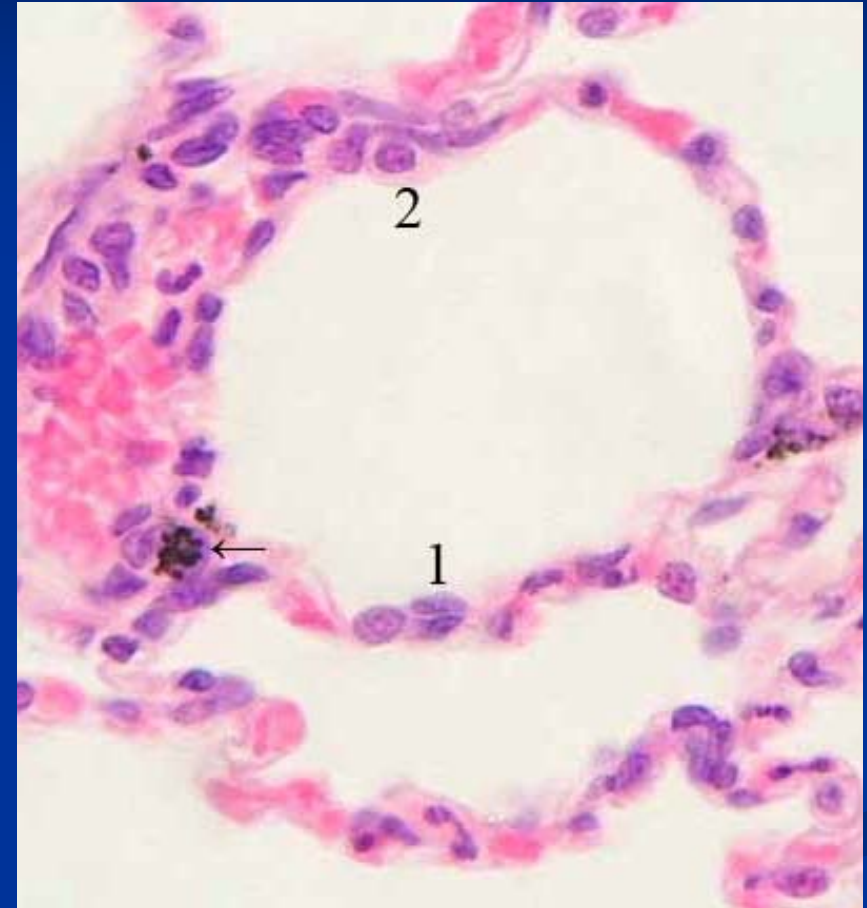
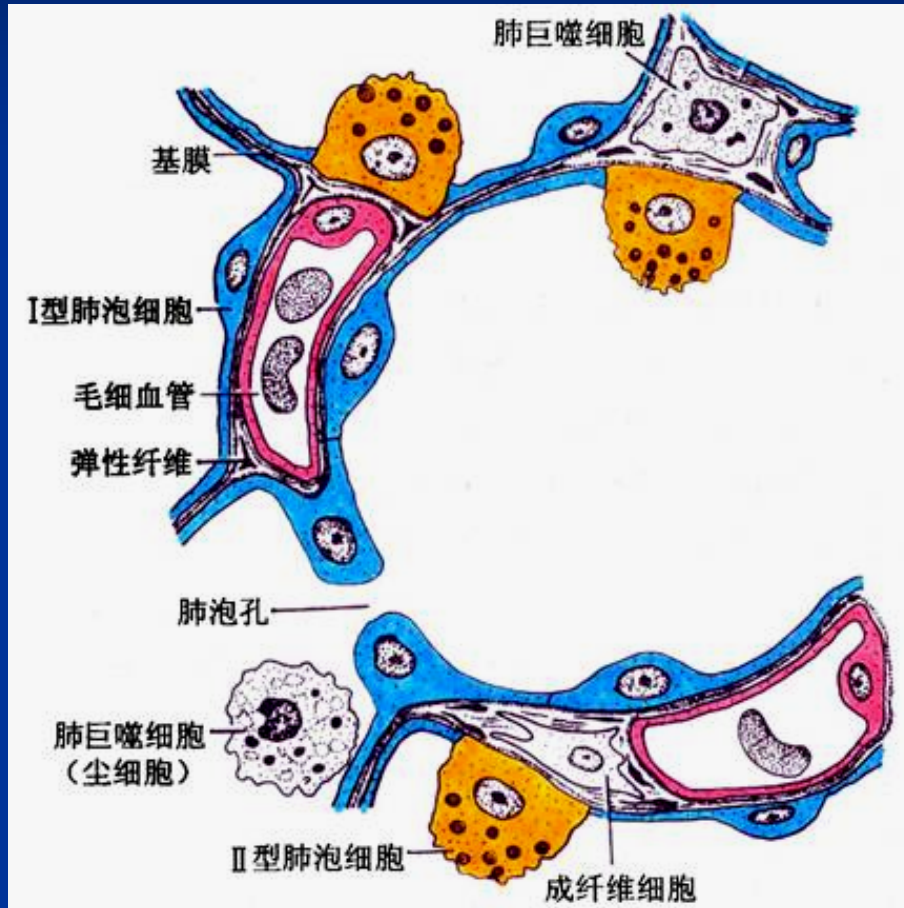
4. pulmonary alveoli



(1) Alveolar epithelium

Type I pneumocytes

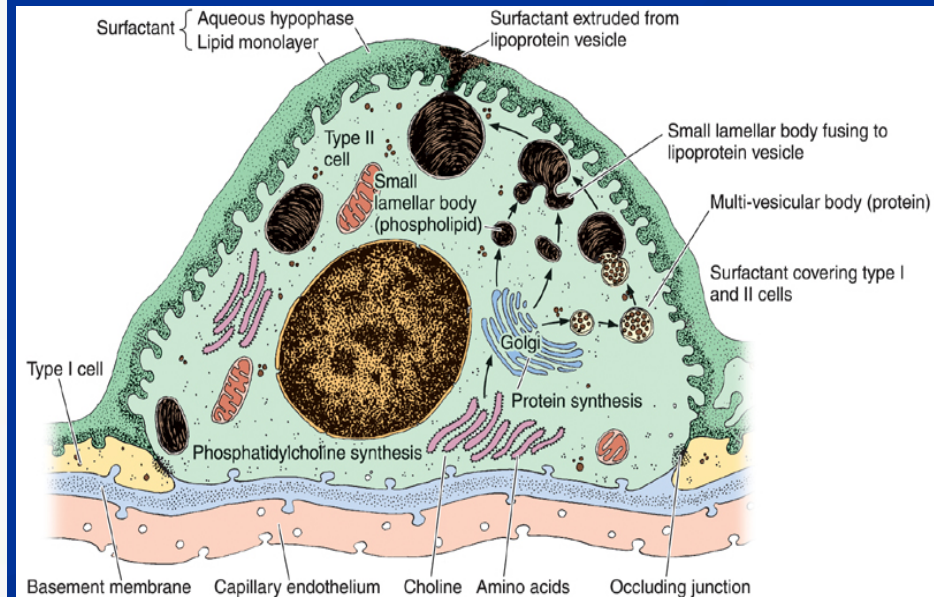
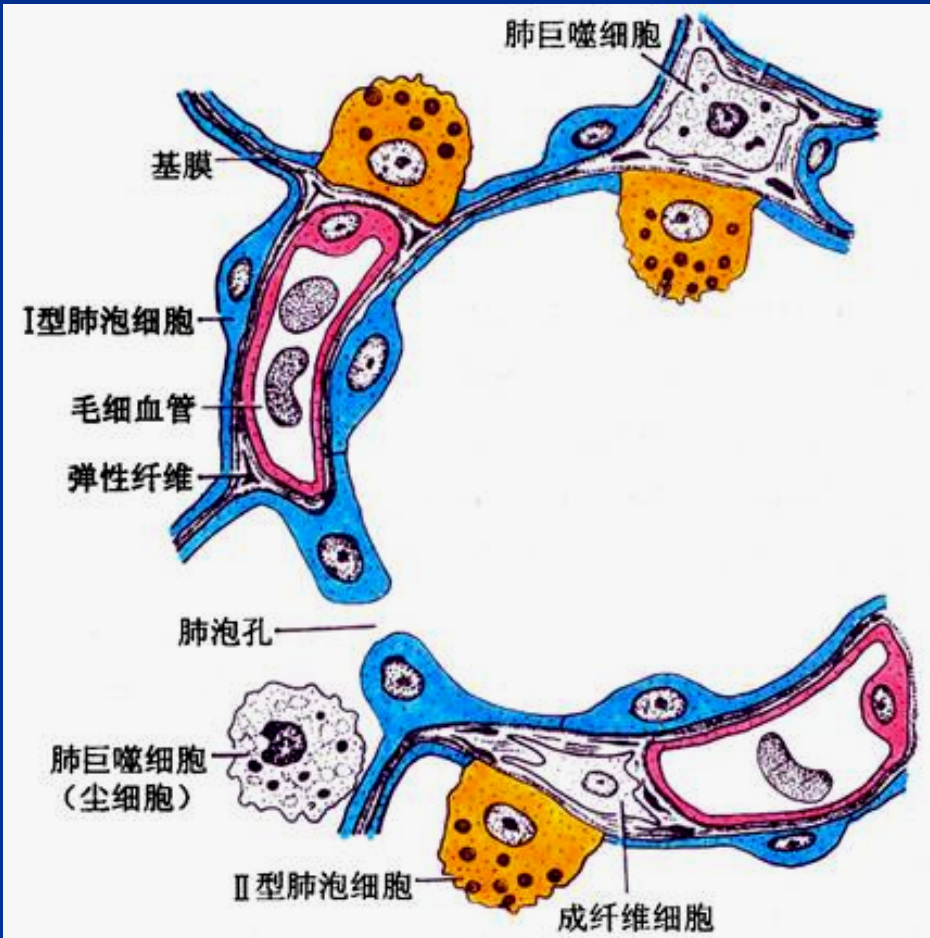
Type II pneumocytes



Type II pneumocytes

Osmophilic multilamellar bodies

(contain rich phospholipids---- surfactant)



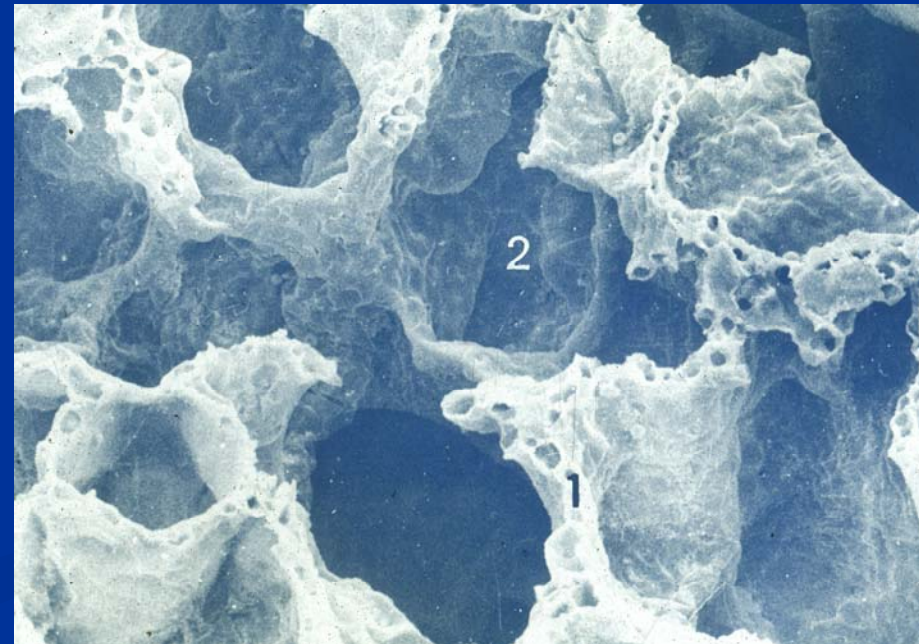
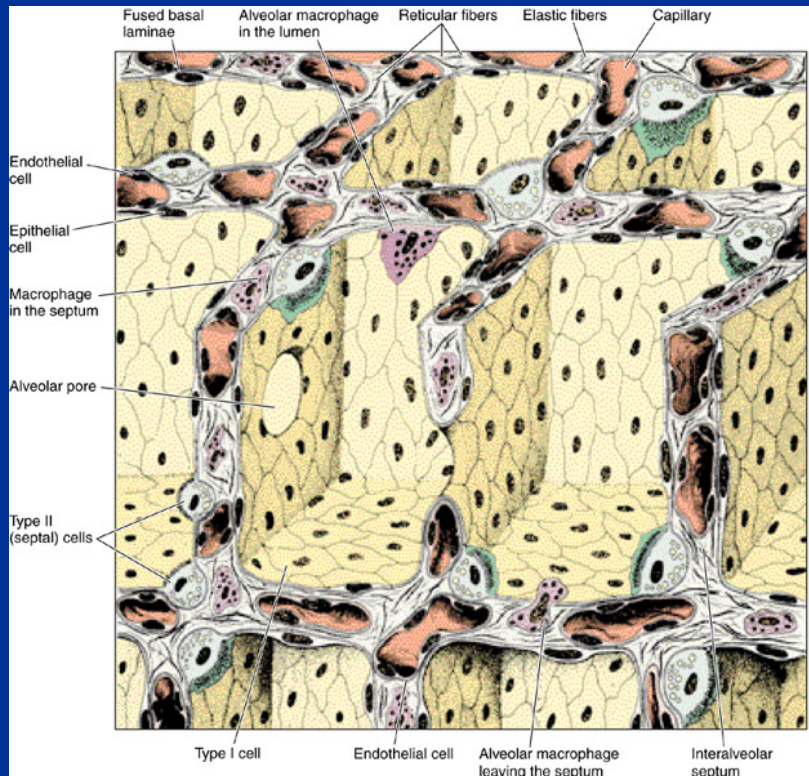
(2) alveolar septum

continuous capillaries meshwork

rich in elastic fibers

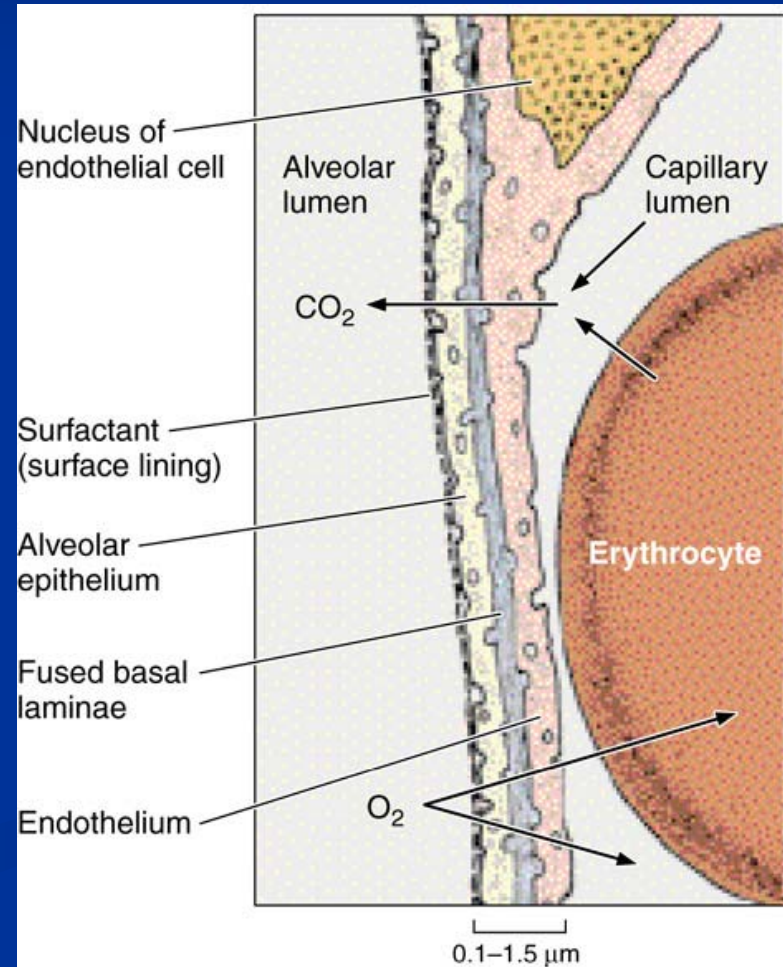
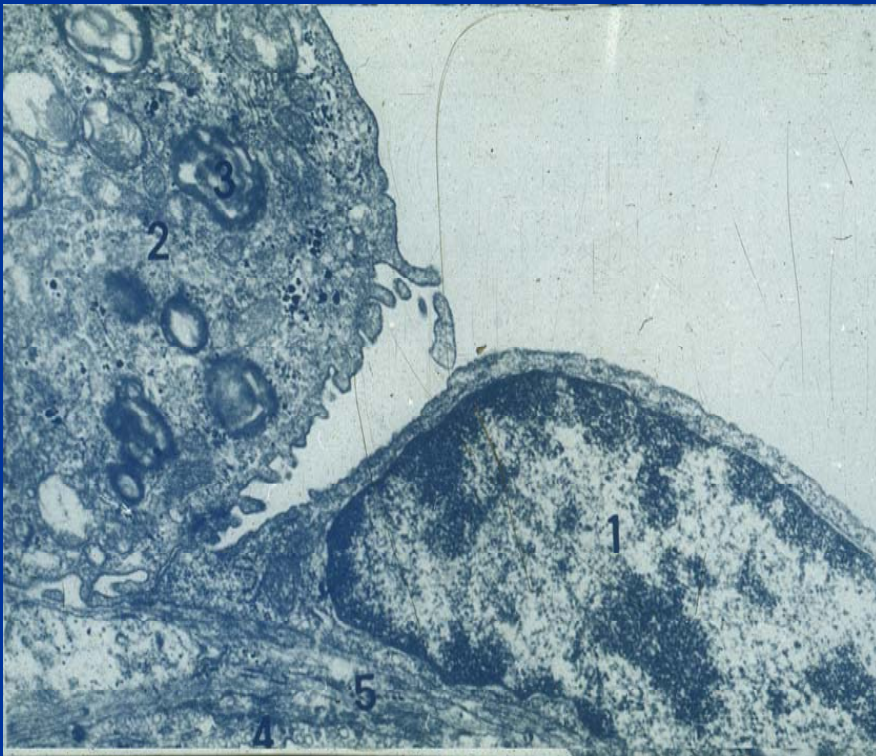
macrophages, plasma cells and mast cells

(3) alveolar pore

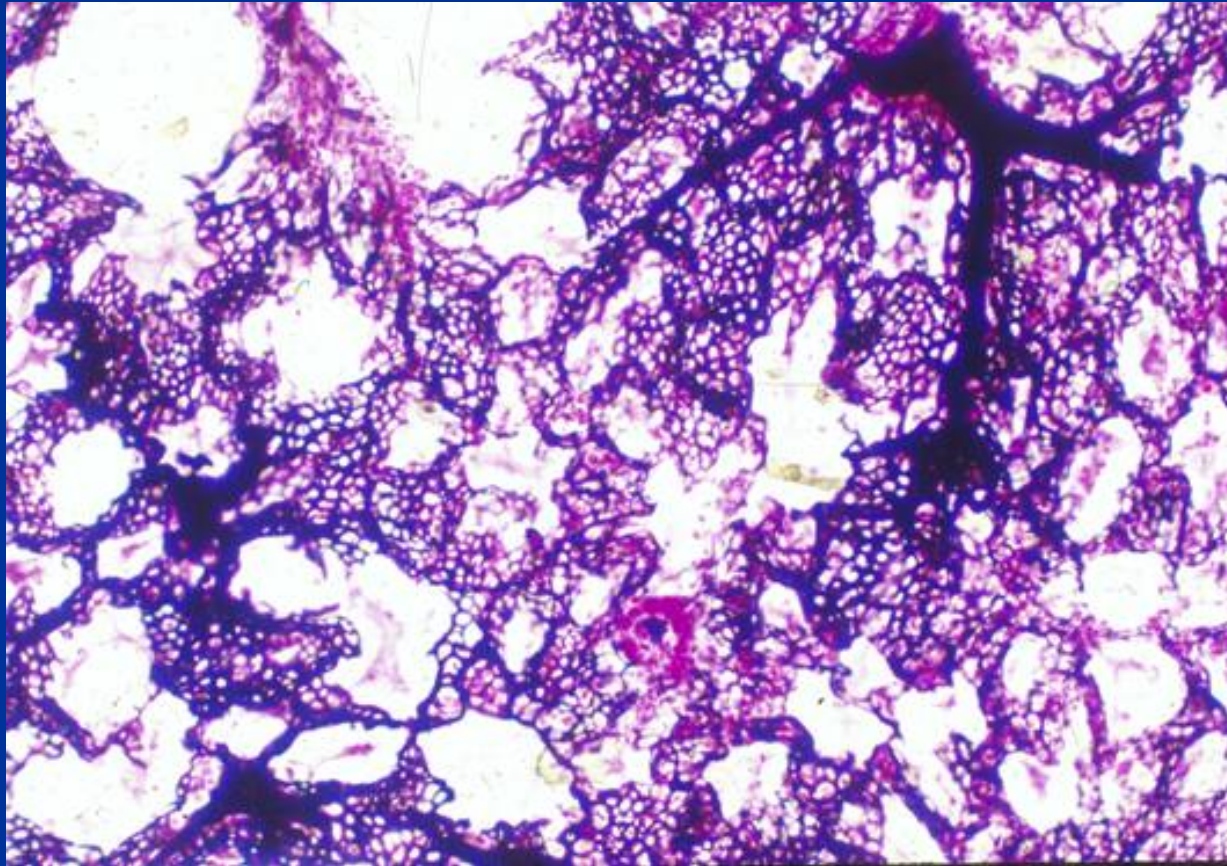


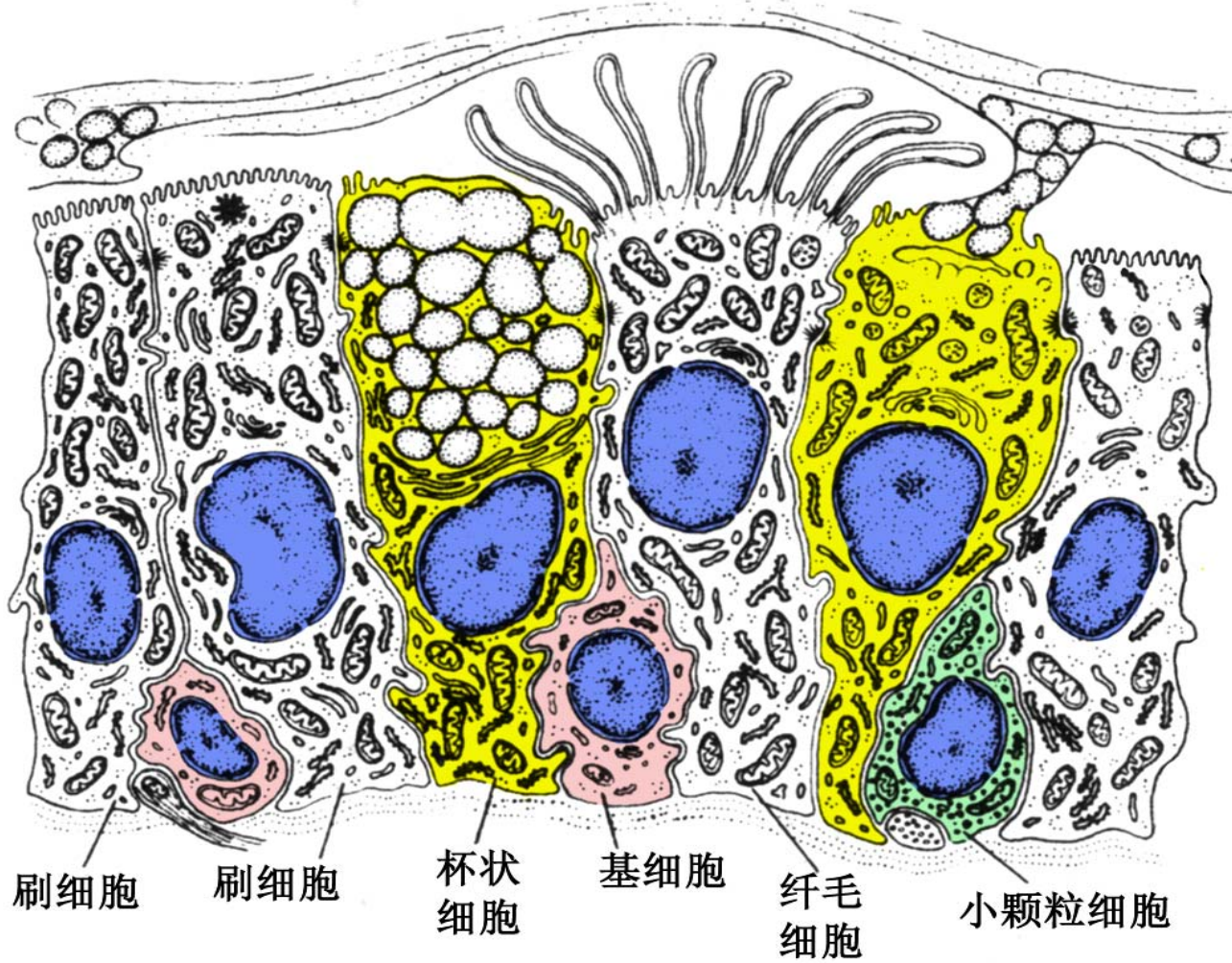
(4) blood-air barrier

surface fluid layer; cytoplasm of type I cells;
the basal laminae ; continuous capillaries ;
the cytoplasm of endothelial cells

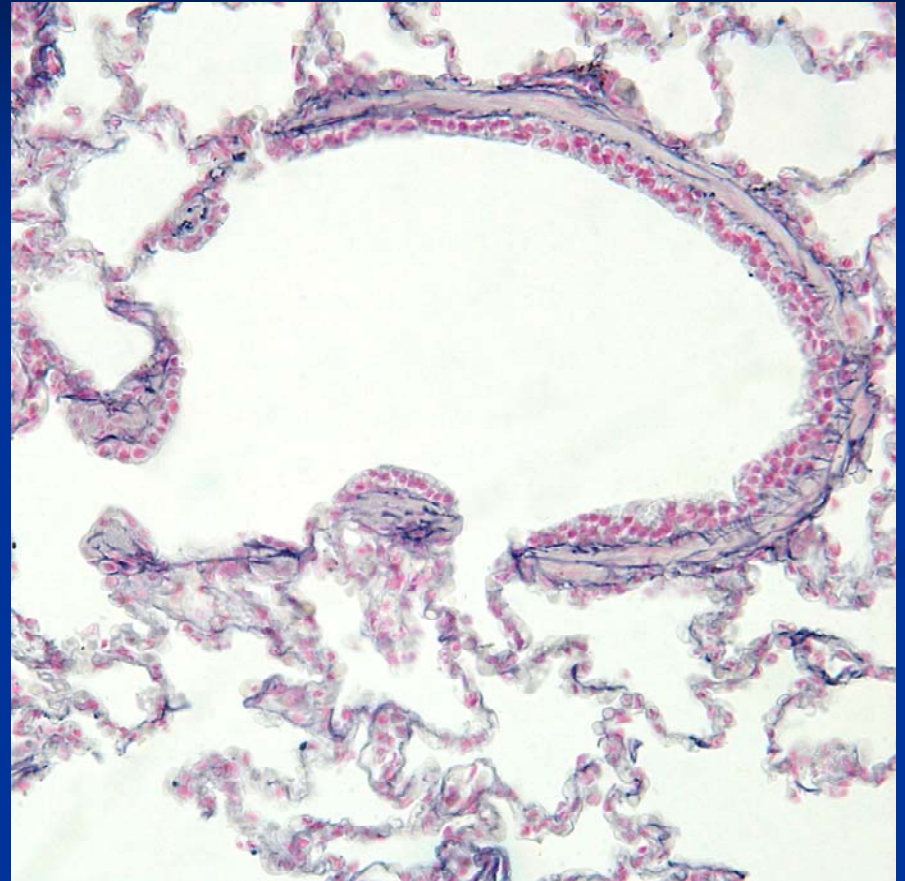
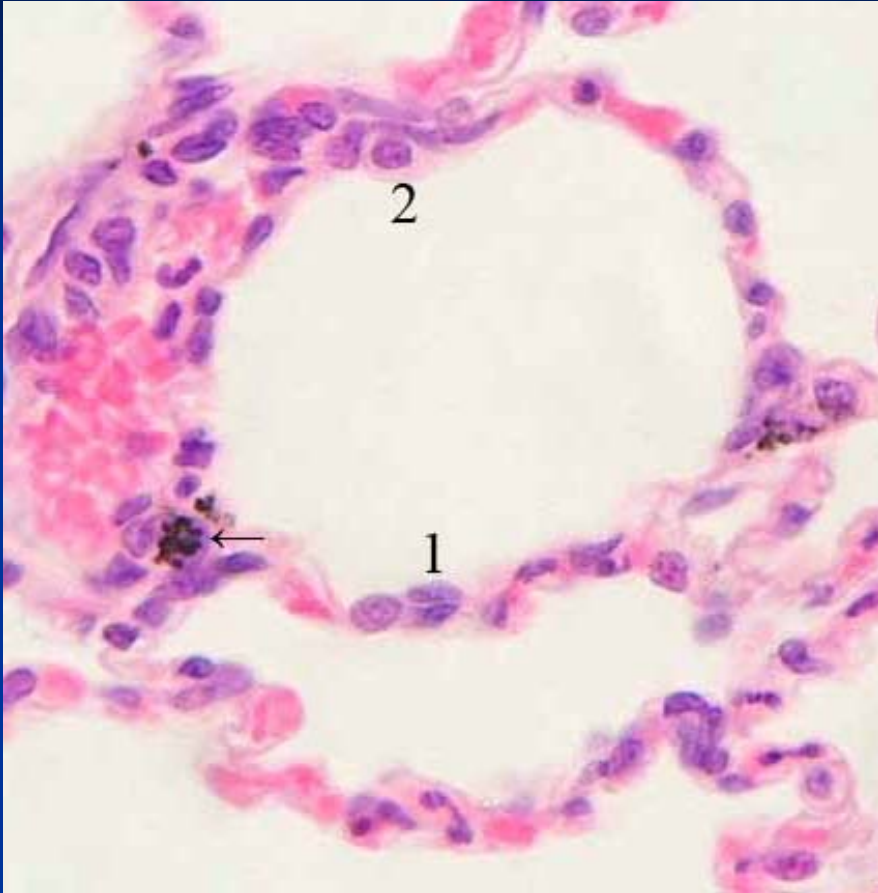


Pulmonary Blood Vessels

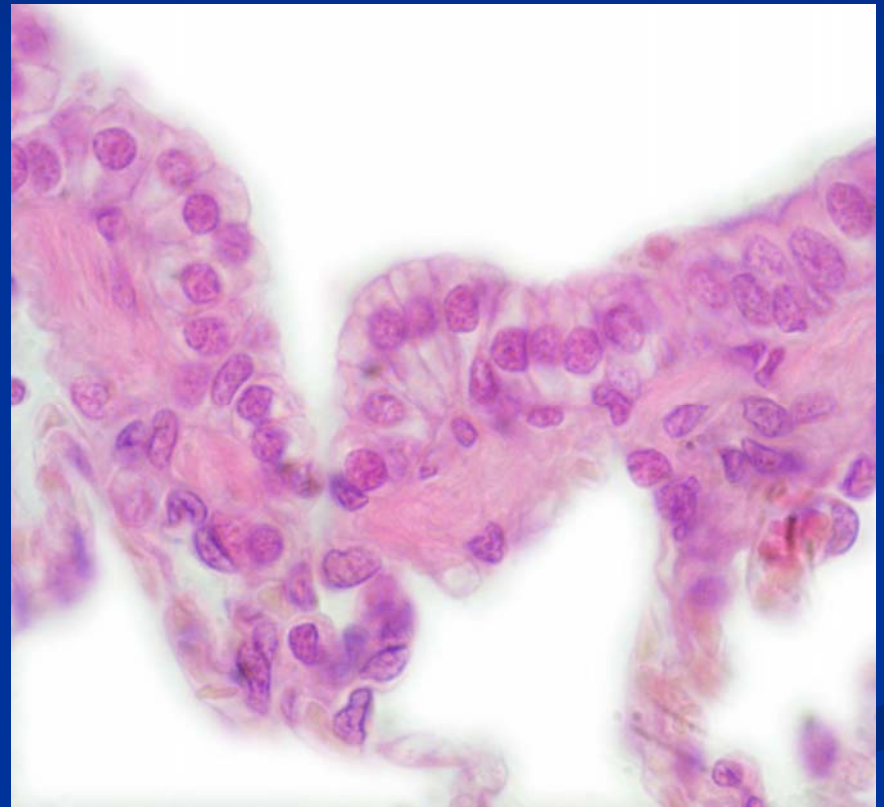
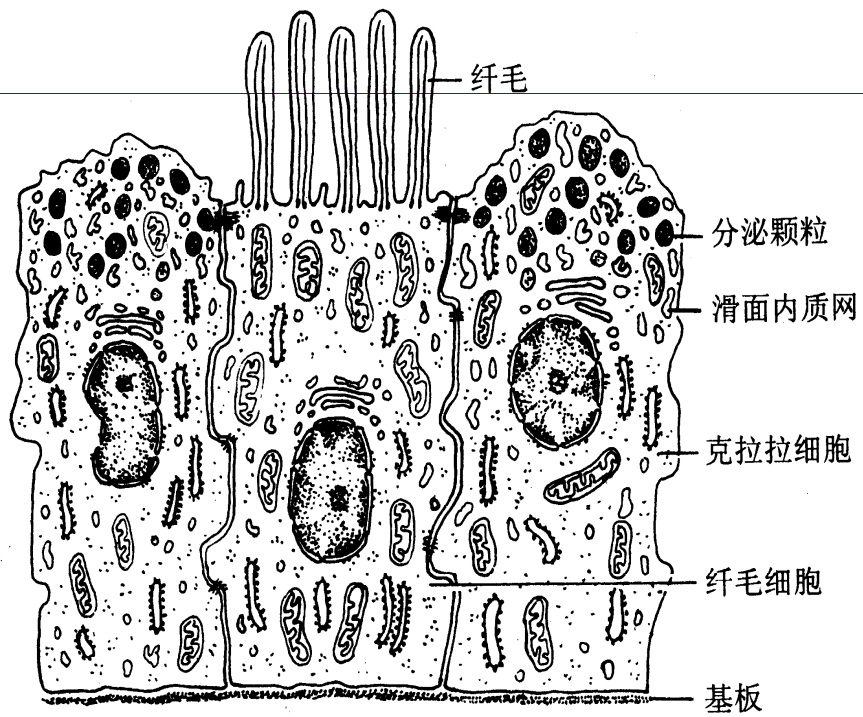


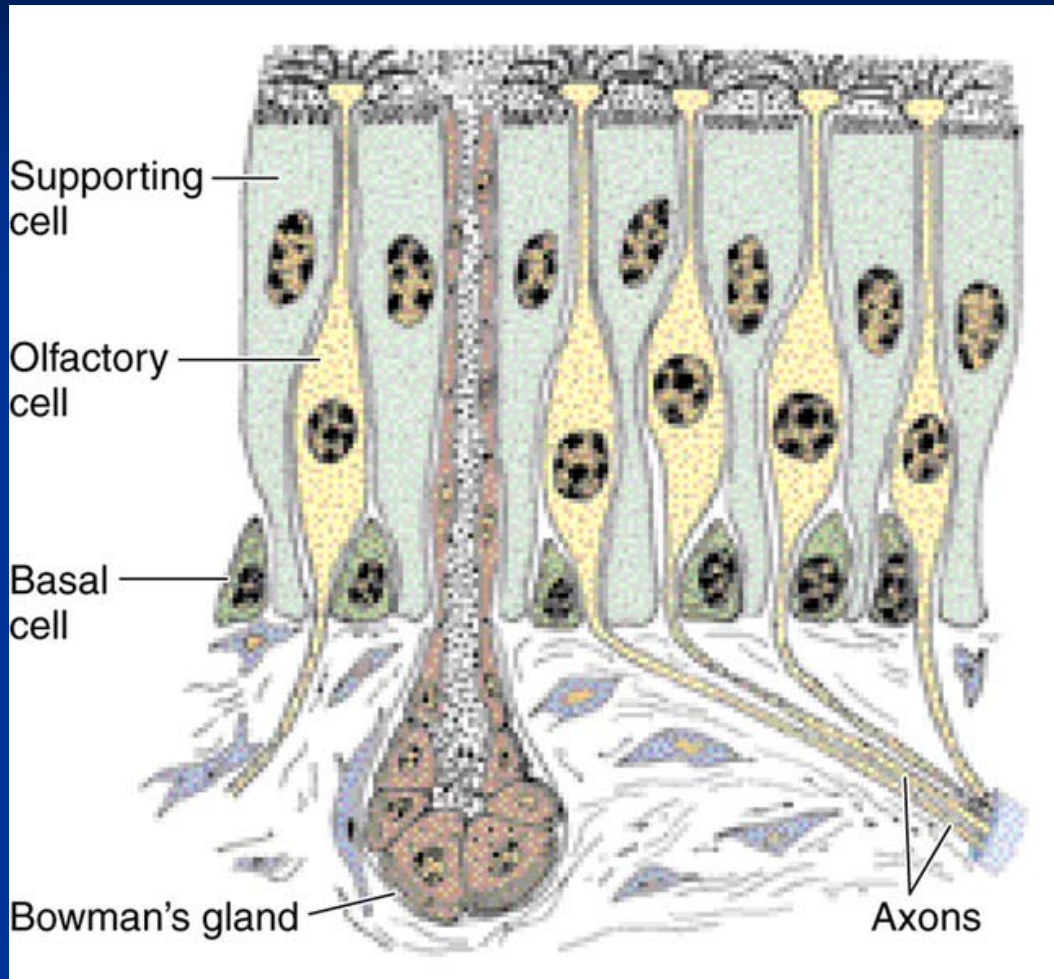






Clara cell:





supporting cells

LM: columnar-shaped cells

EM: microvilli, mitochondria,
junctional complex

function: support and protection

olfactory cells:

bipolar neuron, nucleus pale-
staining, dendrites, olfactory
vesicle, olfactory cilia, axon,
olfactory nerve

basal cells: stem cells

olfactory glands in lamina propria

