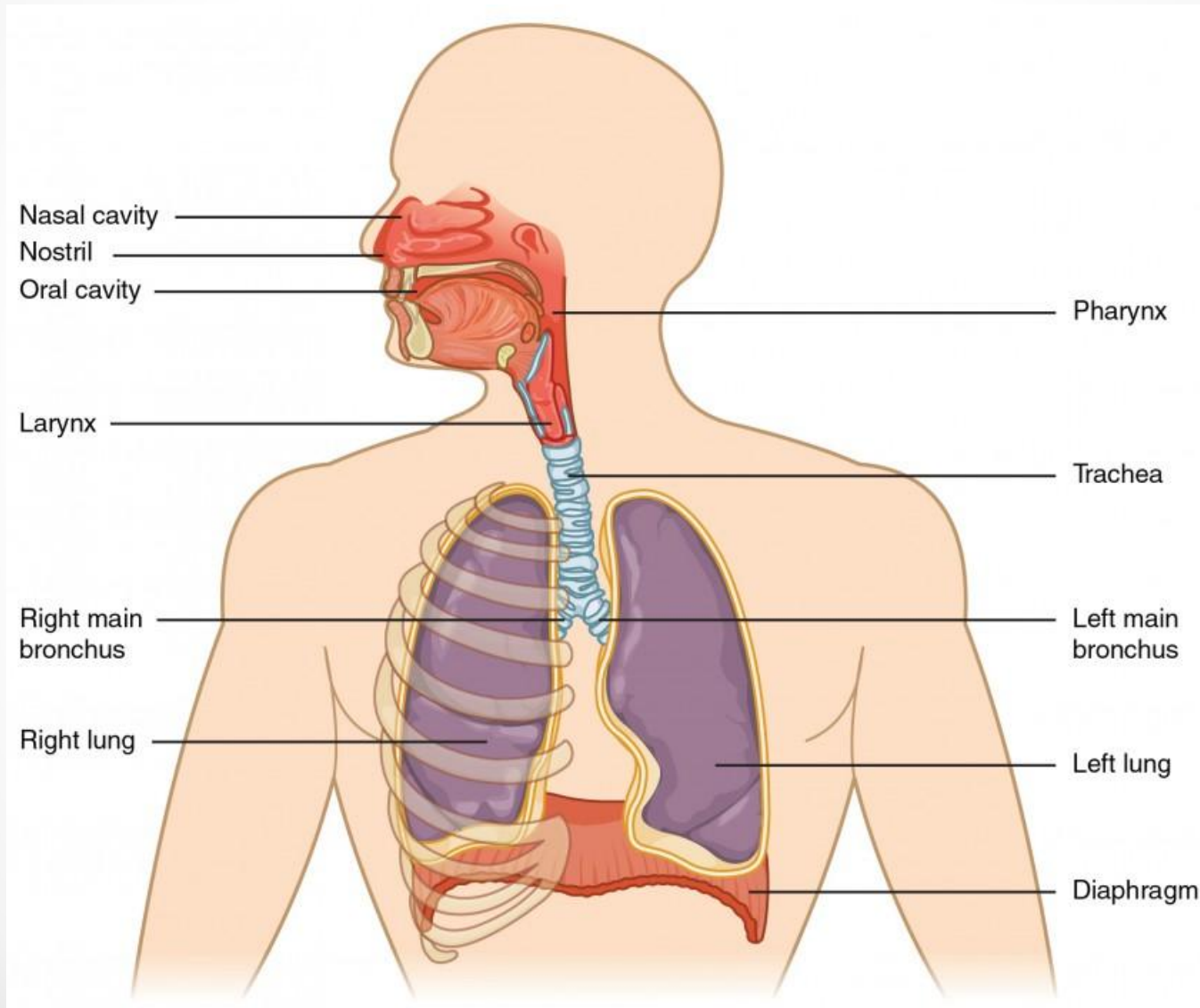


Respiratory system



Functions:

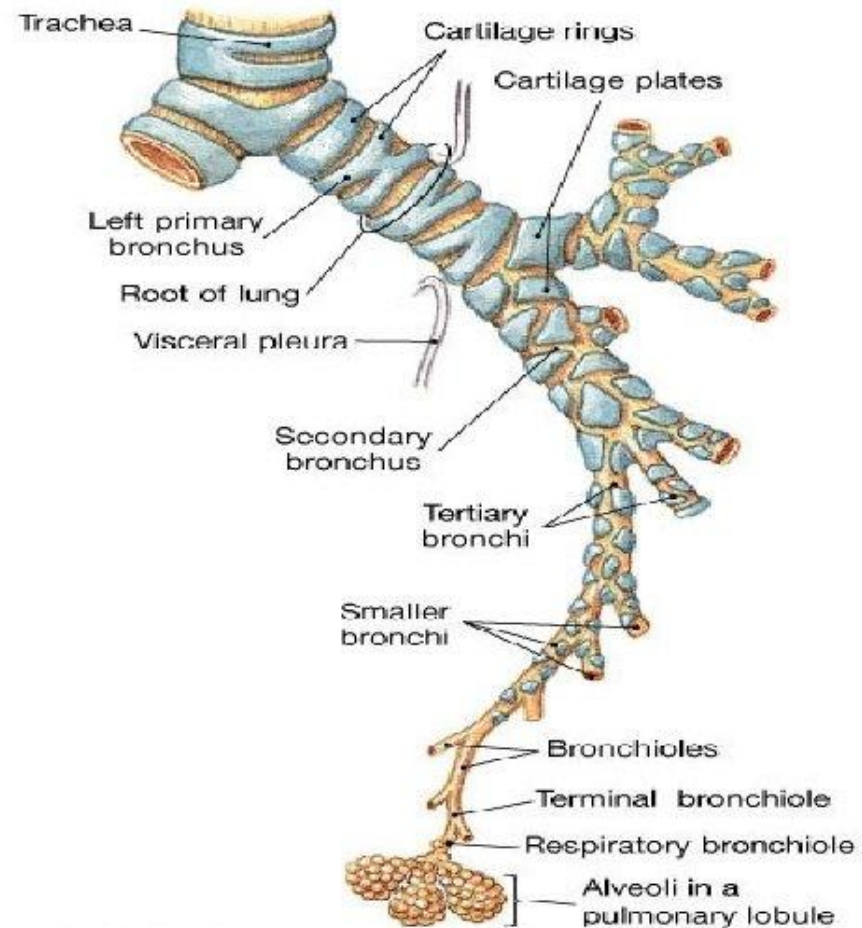
- Air conducting
- Air filtration
- Respiration (gas exchange)
- Thermoregulation
- Humidification
- Filtration from dust and microorganisms
- Deposition of blood
- Regulation of blood clotting by synthesis of thromboplastin and heparin
- Synthesis of hormones, maintenance of water-salt balance, lipid metabolism
- Smelling
- Immune defense



Respiratory system consists of

Conducting portion:

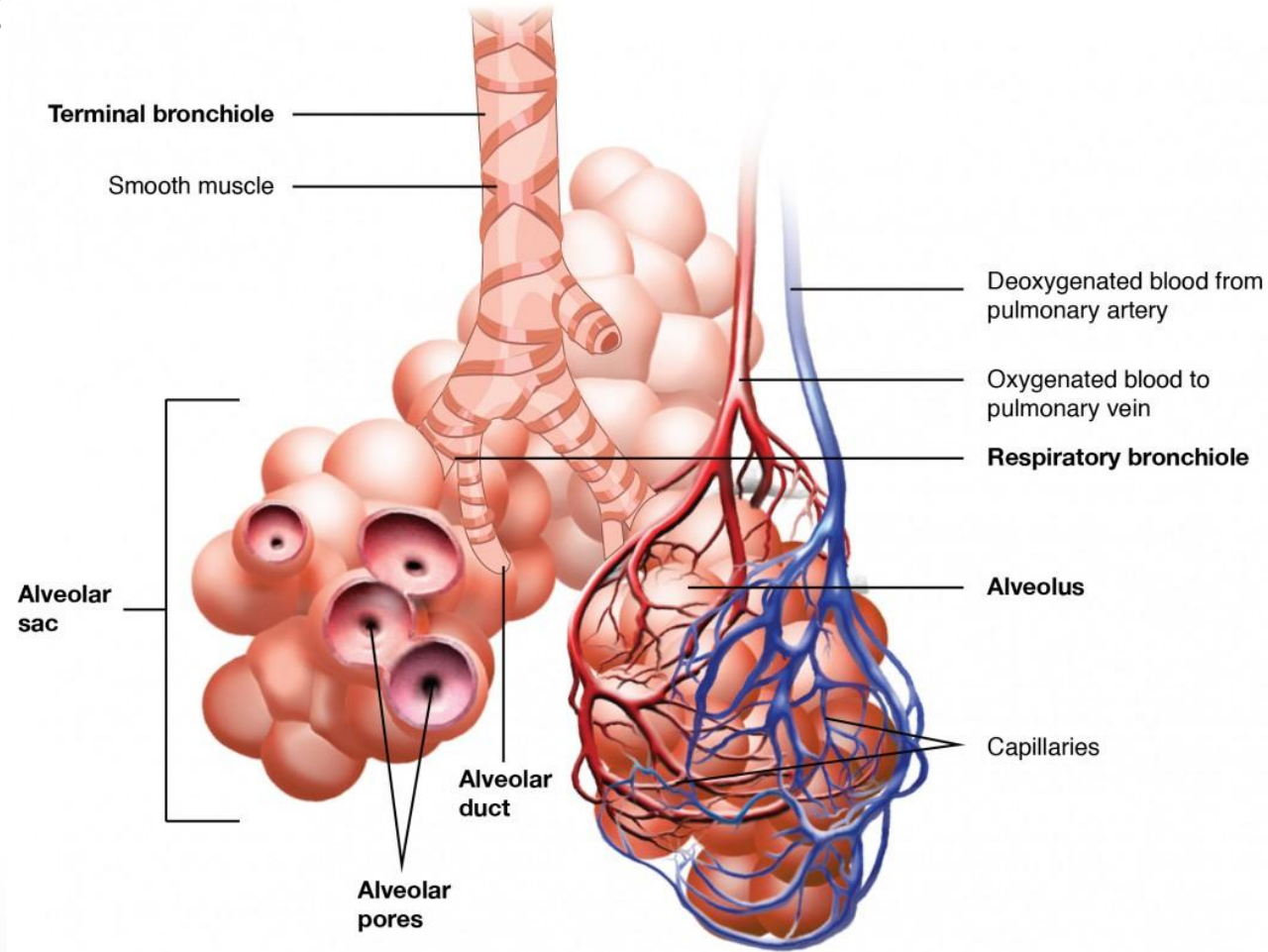
- nasal cavity,
- nasopharynx,
- larynx,
- trachea,
- bronchial tree



Respiratory system consists of

Respiratory portion:

- respiratory bronchioles,
- alveolar ducts,
- alveolar sacs,
- alveoli



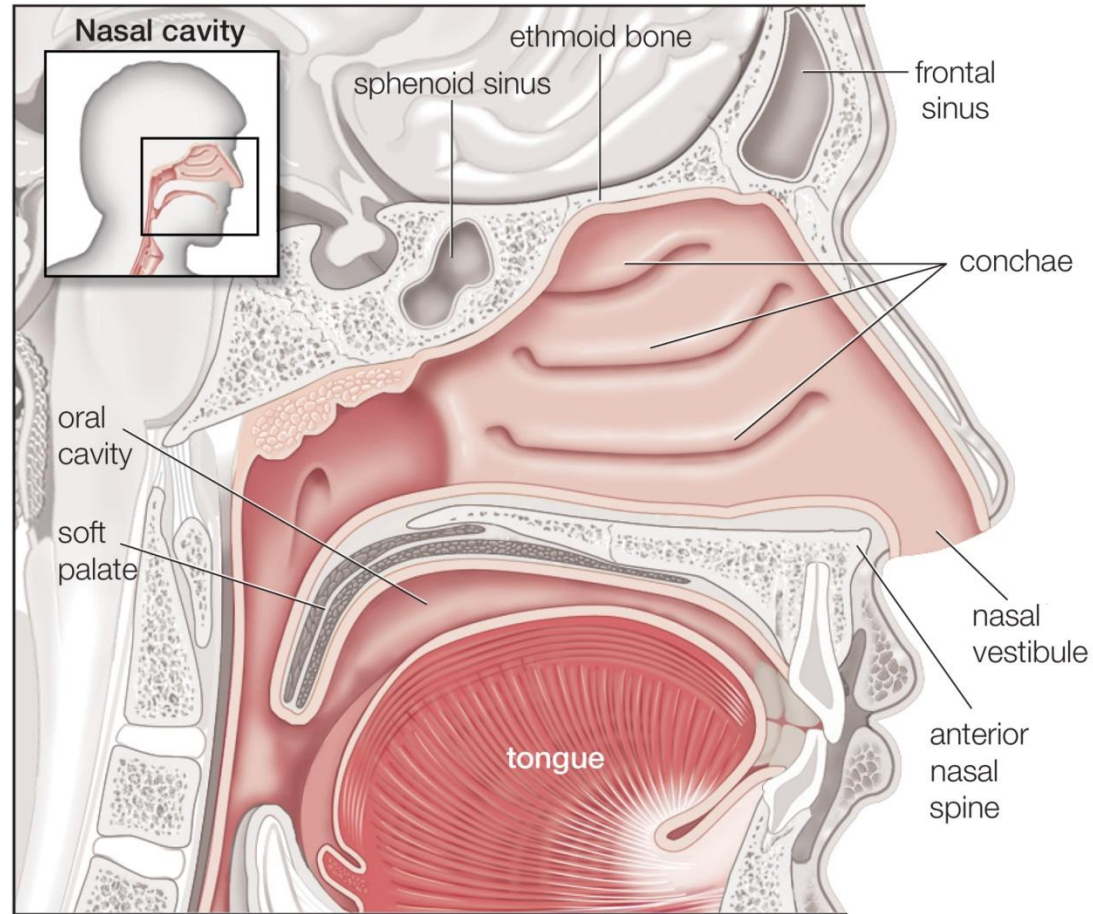
Nasal cavity

- Consists of nasal vestibule

Structure: hyaline cartilage covered by stratified squamous epithelium with underlying connective tissue (sebaceous glands, hair follicles)

- Nasal cavity proper: respiratory region, olfactory region

Structure of respiratory region: pseudostratified epithelium with underlying connective tissue (mucous-secreting cells, lymphatic nodules, rich vascularization)

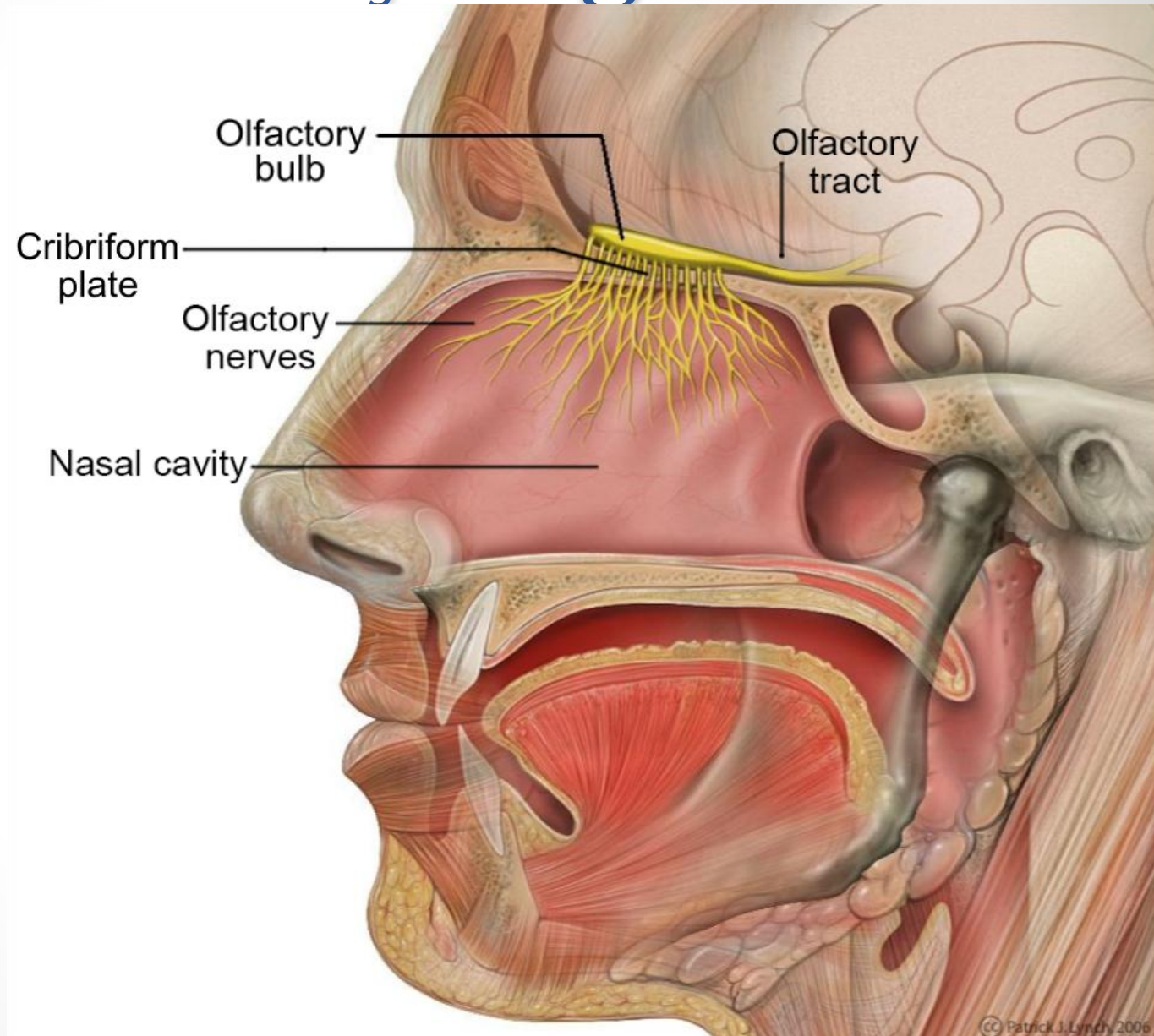


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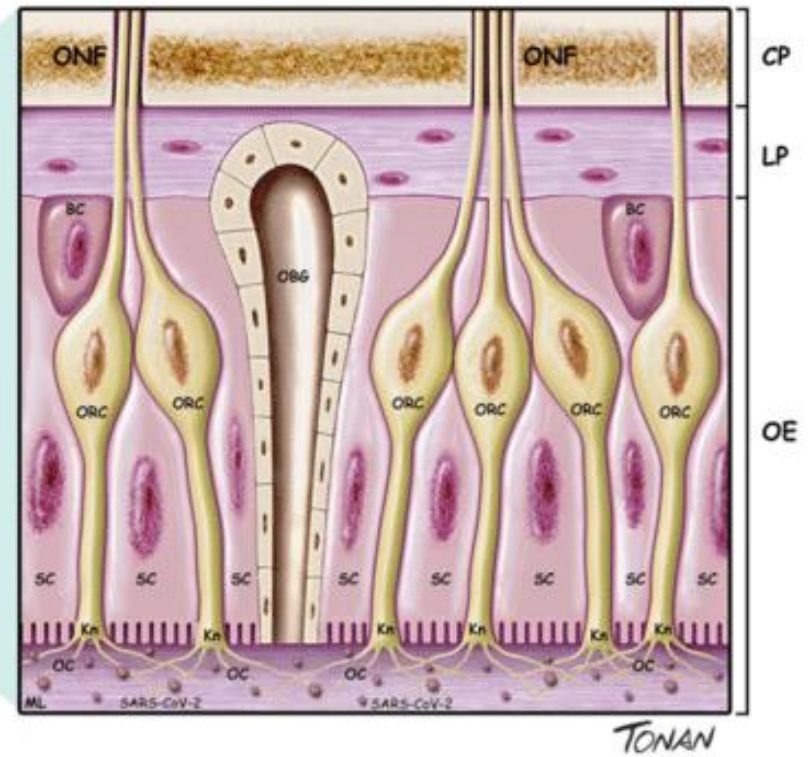
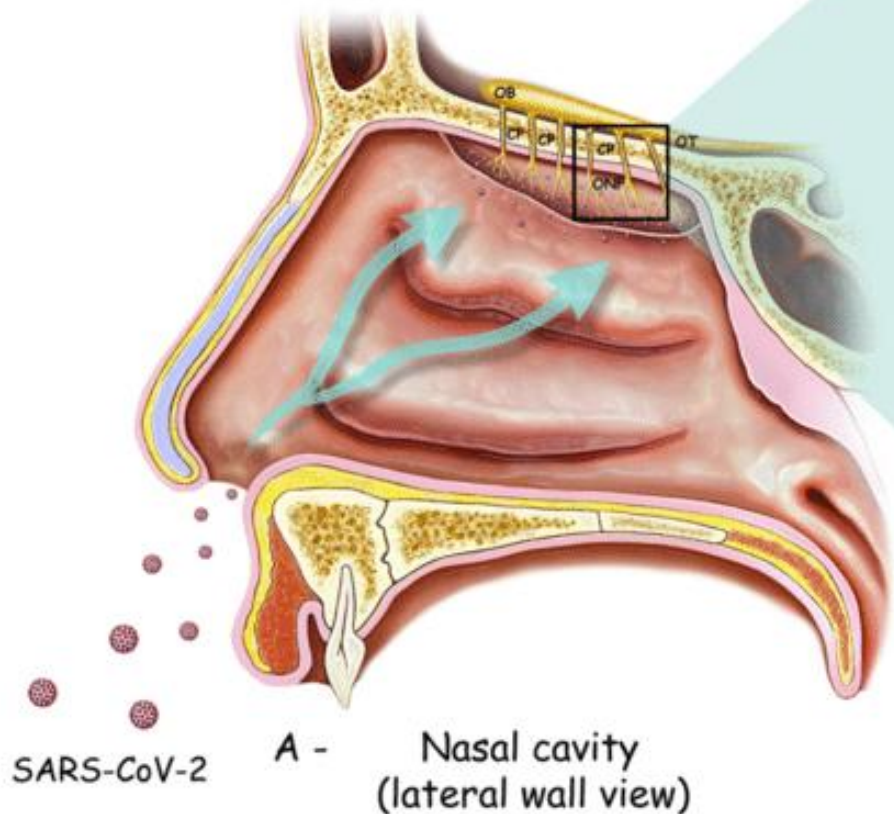
Olfactory organ

Parts:

- Peripheral part: olfactory region of nasal cavity
- Conductive part: olfactory bulb
- Central part: olfactory center in cerebral cortex



Olfactory epithelium



SARS-CoV-2

A - Nasal cavity (lateral wall view)

B - Olfactory epithelium (higher magnification)

Larynx

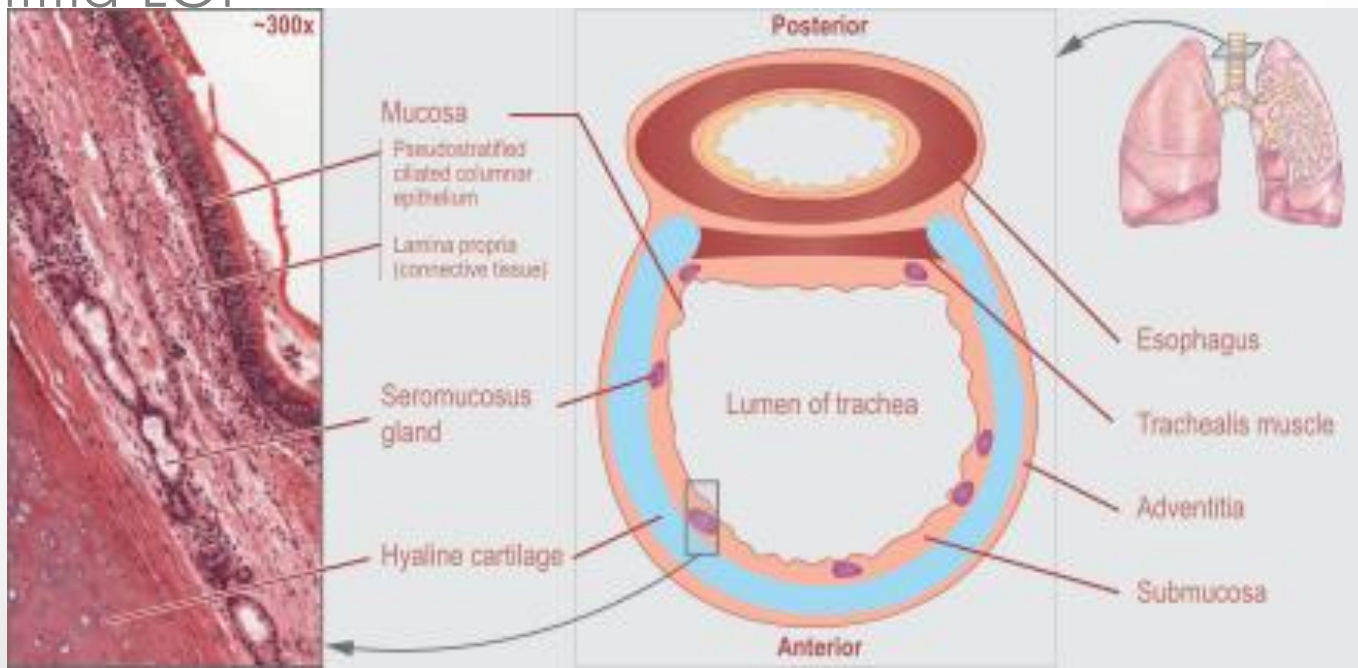
Layers:

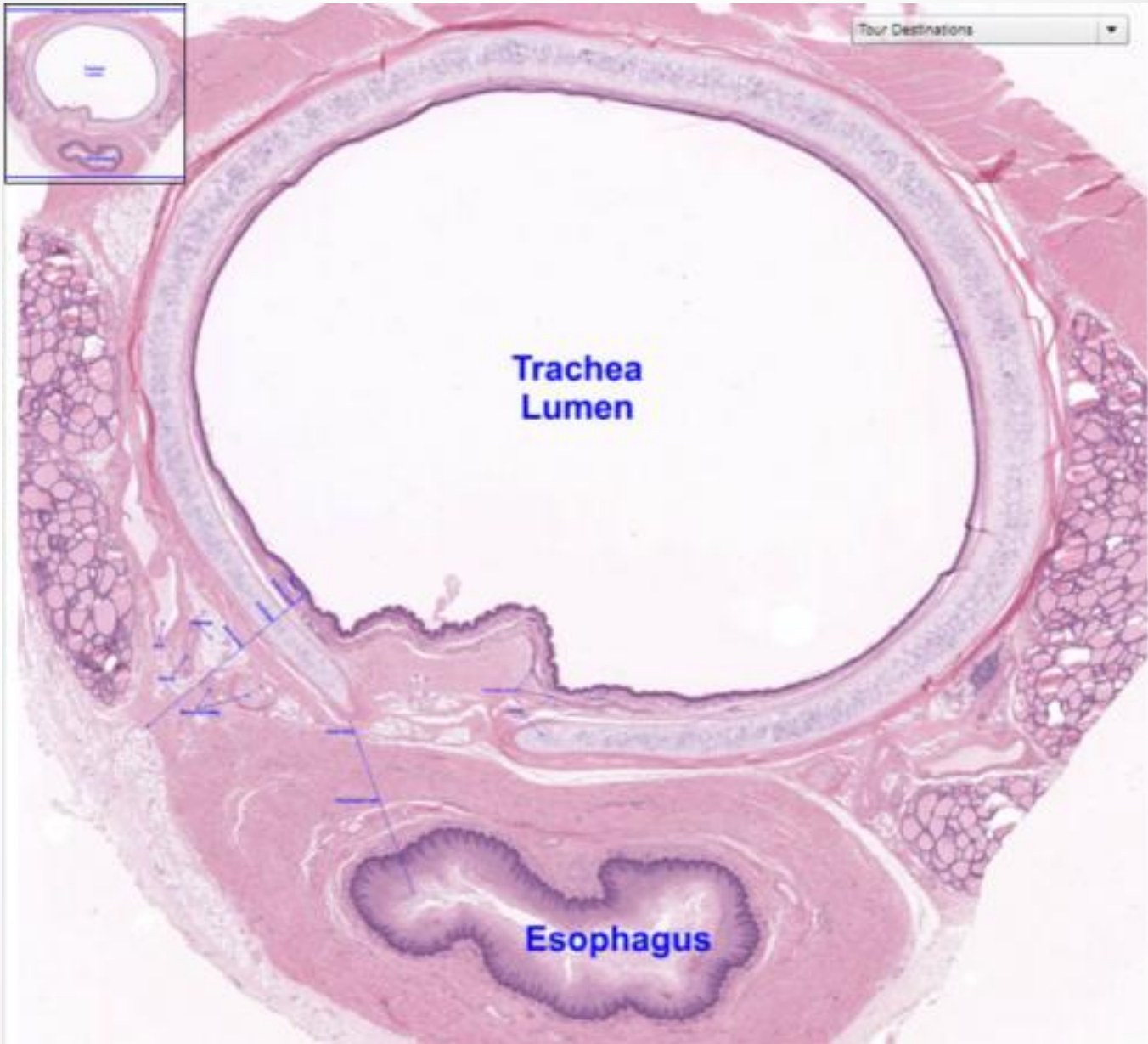
- Mucosa
 - Pseudostratified epithelium (vocal folds-stratified squamos epithelium)
 - Lamina propria-LCT
- Fibrocartilaginous layer- hyaline+elastic cartilage
- Adventitia-LCT

Trachea

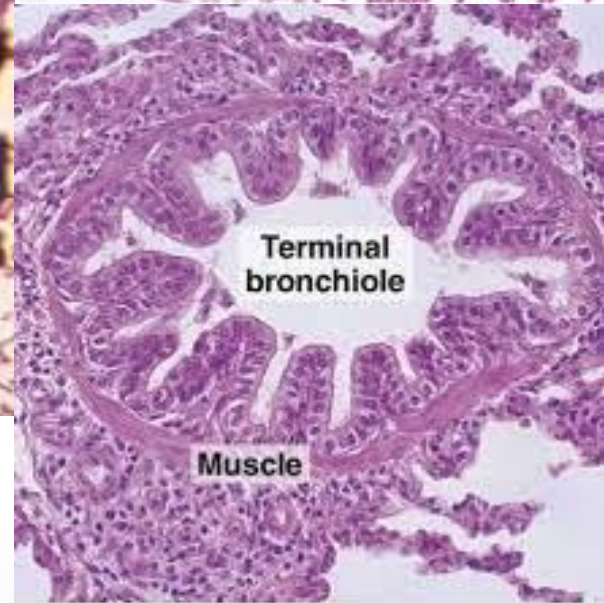
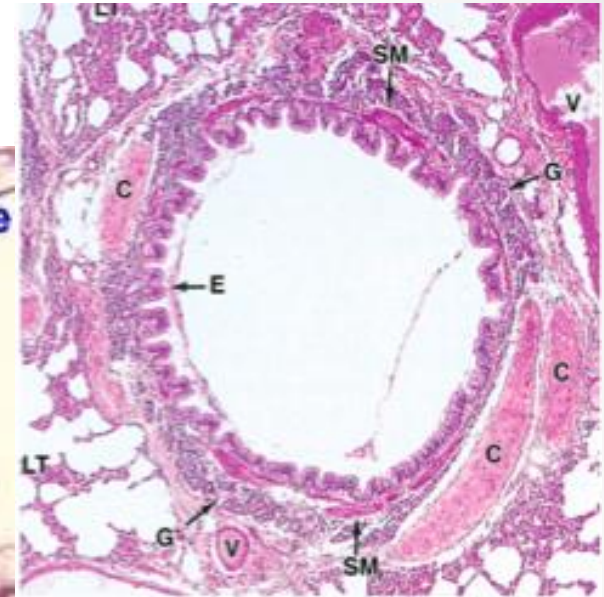
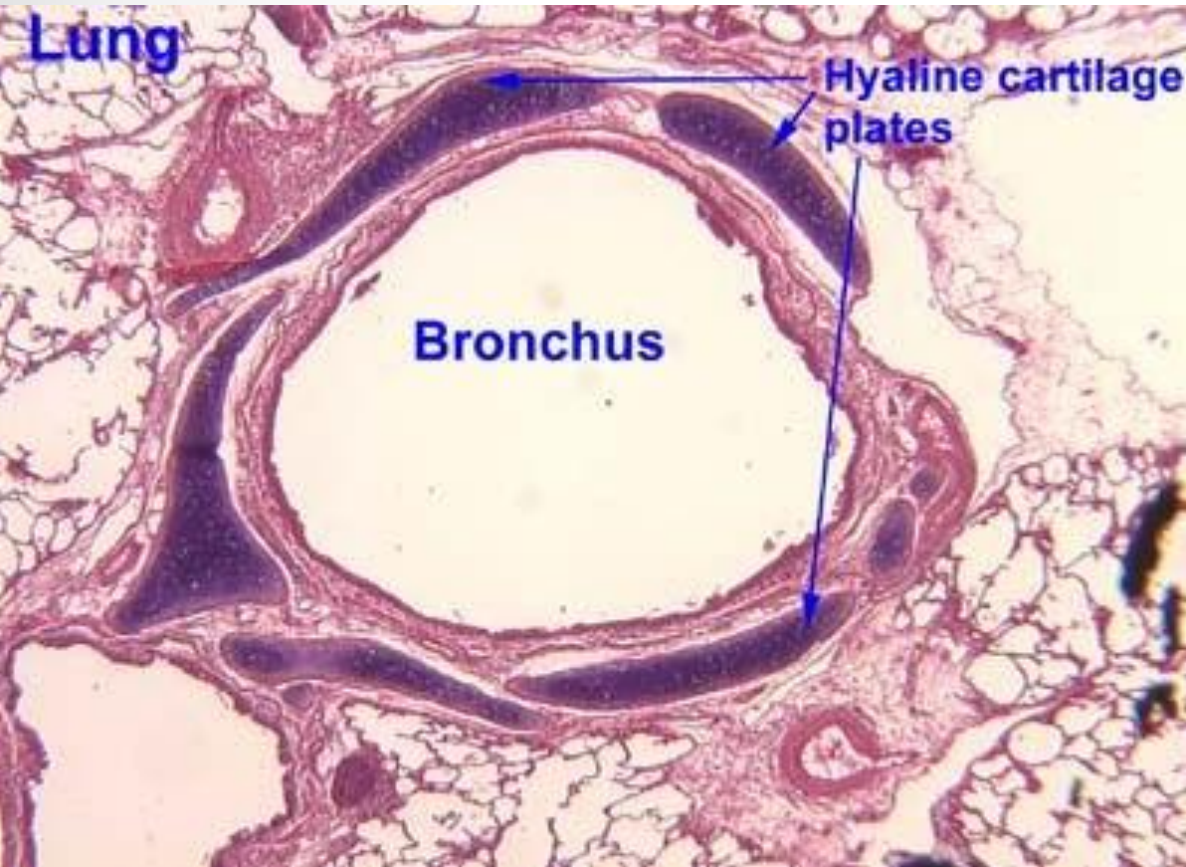
Layers:

- Mucosa
 - Epithelium - pseudostratified
 - Lamina propria-LCT
- Submucosa -LCT + mixed sero-mucous glands
- Fibrocartilaginous layer-C-shaped hyaline cartilage + smooth muscle tissue
- Adventitia-LCT





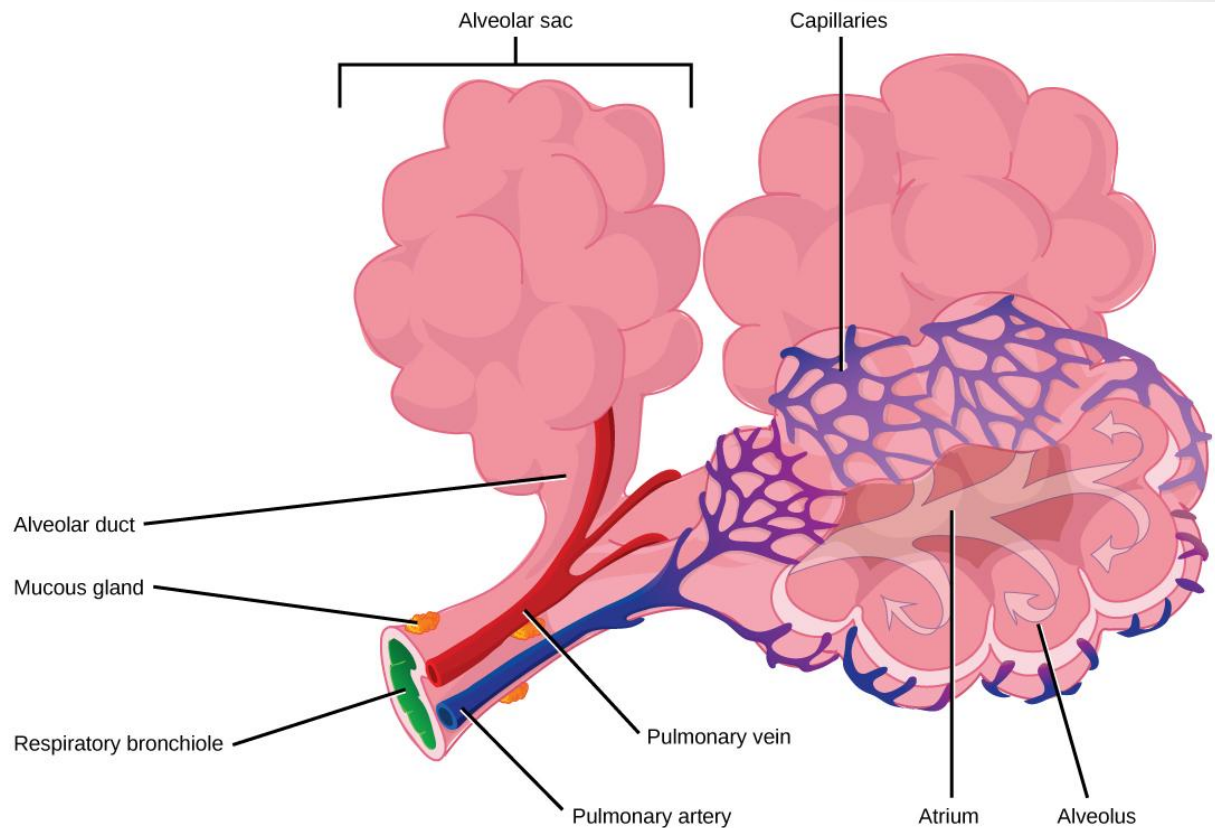
Bronchial tree



Pulmonary acinus - structural and functional unit of respiratory portion

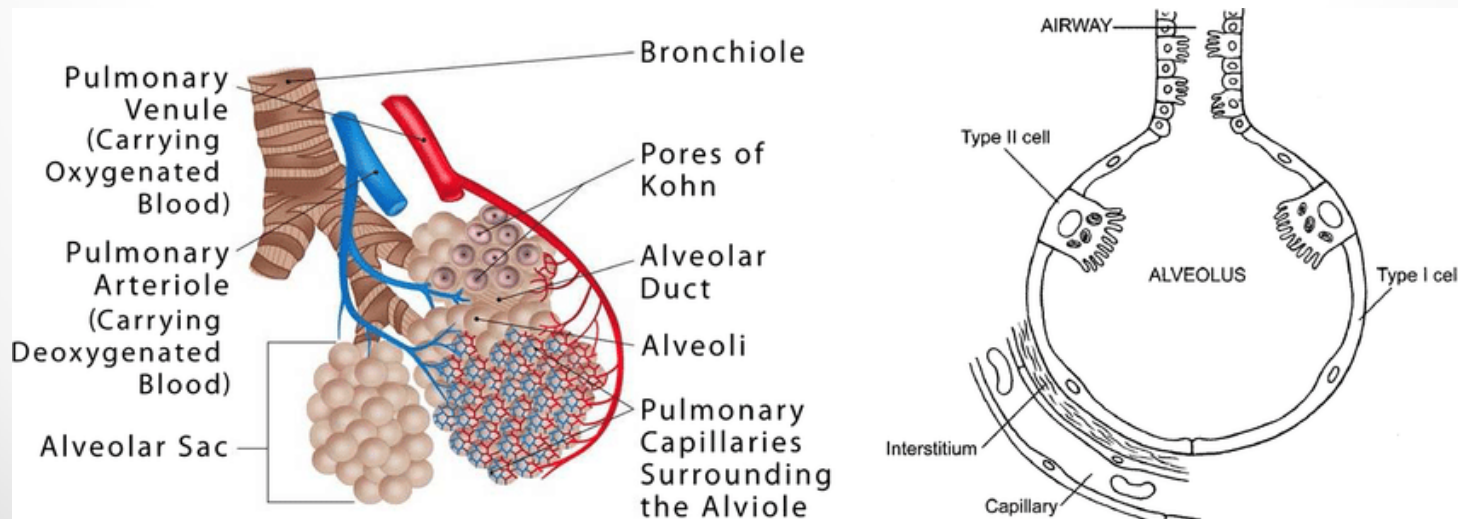
The acinus consists of:

- Respiratory bronchioles of I,II,IIIrd order
- Alveolar ducts
- Alveolar sacs



Alveolus

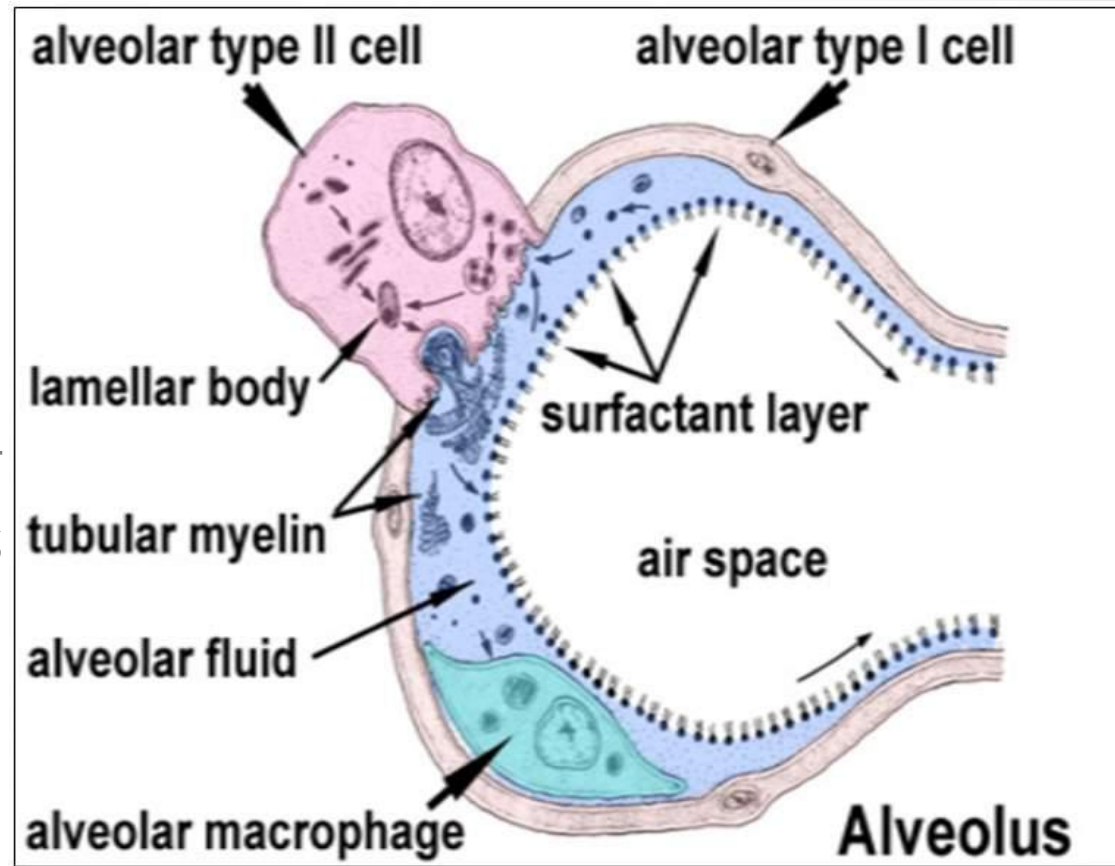
- Consists of cell:
- Respiratory (I type of pneumocytes)-squamos cell with short cytoplasmic projections on their apical surface
- Secretory (II type of pneumocytes)-cuboidal in shape with well-developed Golgi apparatus and RER.
- Alveolar macrophages



Surfactant

Phases:

- Membranous component-phospholipids and proteins
- Aqueous component (hypophase)-proteins dissolved in water
- Reserve surfactant (myelin-like structures)



Air-blood barrier

- Endothelial cell of capillary
- Nuclear-free portion of the respiratory cell
- Surfactant

