



LUNG PHYSIOLOGY AND ITS FUNCTIONS

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Abstract *The lungs play a fundamental role in gas exchange, ensuring oxygen uptake and carbon dioxide removal from the bloodstream. They also contribute to pH regulation, immune defense, and metabolic functions. This article explores the physiology of the lungs and their essential functions.*

Keywords : *Lung, fundamental role.*

Introduction The lungs are paired organs located in the thoracic cavity, protected by the rib cage and the pleural membrane. They are responsible for oxygenating blood and expelling carbon dioxide through a process known as respiration. The lungs work in coordination with the cardiovascular system to sustain cellular metabolism and homeostasis.

Respiratory Mechanism Lung ventilation involves two main phases:

- **Inhalation (Inspiration):** The diaphragm and intercostal muscles contract, increasing thoracic volume and decreasing intrapulmonary pressure, allowing air to enter the lungs.
- **Exhalation (Expiration):** The diaphragm relaxes, reducing thoracic volume and increasing pressure, forcing air out.

Gas Exchange and Transport Gas exchange occurs in the alveoli, tiny sacs surrounded by capillaries. Oxygen diffuses into the blood, binding to hemoglobin, while carbon dioxide diffuses out for exhalation. Partial pressure gradients drive this process, maintaining efficient oxygenation of tissues.



Regulation of Respiration Respiration is controlled by the brainstem, primarily the medulla oblongata and pons. Chemoreceptors detect changes in blood pH, oxygen, and carbon dioxide levels, adjusting the respiratory rate accordingly.

Other Functions of the Lungs

1. **pH Regulation:** The lungs help maintain acid-base balance by modulating CO₂ levels.
2. **Immune Defense:** The respiratory system contains cilia and mucus that trap pathogens, preventing infections.
3. **Metabolic Functions:** The lungs participate in converting angiotensin I to angiotensin II, which regulates blood pressure.

Conclusion The lungs are vital for respiration and overall homeostasis. Understanding lung physiology is essential for diagnosing and treating respiratory diseases such as asthma, COPD, and pneumonia. Continued research on pulmonary function can lead to advancements in respiratory medicine.

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