

PULMONARY FUNCTION II

COURSE: Systems Biology, BMSC 414, Tissue and Organ Function

LECTURE: Lecture 20, Pulmonary Function II

DATE: Thurs., Nov. 13, 2008, 10:00-11:30 AM

LECTURER: Charles L. Webber, Jr., Ph.D.

LOCATION: Dept. Physiology, Bldg. 102; Rm. 4614,

TEL: 708-216-3343

EML: cwebber@lumc.edu

URL: <http://homepagdes.luc.edu/~cwebber/>

REQUIRED READING ASSIGNMENT:

Costanzo's Physiology, Third Edition, 2006, Chapter 5 (pp. 209-233)

LEARNING OBJECTIVES

1. To know how O₂ and CO₂ are stored in and convected by the blood for distribution throughout the body,
2. To understand how the oxyhemoglobin dissociation curve can be used to describe the loading and unloading of oxygen from the blood.
3. To explain the importance of RBCs in the processing and transport of O₂ and CO₂ in the blood.
4. To explain the importance of ventilation-perfusion matching of airflow and blood flow in the normal vertical lung subjected to forces of gravity.
5. To give an overview of the neural control of ventilation with application to states of exercise and high altitude.

REVIEW QUESTIONS

1. Can you list the different forms of O₂ and CO₂ in the blood and explain why PaO₂ can usually (but not always) be ignored, but not PaCO₂?
2. Can you plot how arterial and venous points move on the oxyhemoglobin curve during a voluntary breathhold?
3. Why is bicarbonate ion the most common form of CO₂ in the blood and where is the concentration of HCO₃⁻ the highest, in arterial or venous blood?
4. What are the three types of alveoli according to their ventilation perfusion ratios and what reflexes are in place to help keep regional \dot{V}_A/Q ratios near normal?
5. What is the location of the central and peripheral chemoreceptors and what are their roles during physical exercise and breathing rarefied air at high altitude?