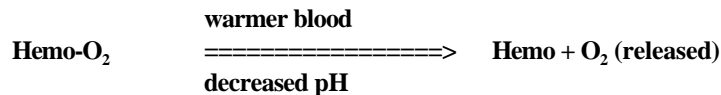


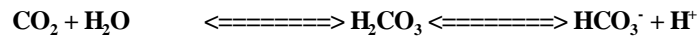
GENERAL BIOLOGY Lecture 32 - Respiration

I. Purpose and strategies of respiration

- A. Purpose: Acquire oxygen and eliminate carbon dioxide
- B. Strategy and mechanism of gas exchange
 - 1. Components of air
 - a) Nitrogen: 78% (by volume)
 - b) Oxygen: 21%
 - c) Argon and other gases: 0.97%
 - d) Carbon dioxide: 0.03%
 - 2. Air moves by bulk flow into and out of lungs
 - a) Referred to as pulmonary ventilation
 - 3. In lungs, oxygen diffuses (from high to low) from alveoli (little lung sacs), through interstitial fluid, and into the blood capillaries - carbon dioxide diffuses in the opposite direction
 - 4. Hemoglobin facilitates oxygen transport; carbonic anhydrase facilitates CO₂ transport - regulating factors include:



[High O₂ in blood] -----> transport to tissues -----> [low O₂ in blood]



- a) Concentrations of oxygen and carbon dioxide
- b) pH
- c) Temperature

II. Components of the respiratory system

- A. Nasal cavities (nose) - entrance for air
- B. Pharynx (throat) - entrance to respiratory & digestive tract
 - 1. Larynx (contains vocal cords - open area = glottis) leads to the lungs; esophagus leads to the stomach
 - 2. Epiglottis - covers the larynx during swallowing of food
- C. Trachea (wind pipe) - entrance just before lungs
- D. Two bronchi - entrances for lungs
- E. Bronchioles - branching of bronchi
- F. Alveoli - outpouchings of bronchioles
 - 1. Gas exchange between air and blood occurs across alveoli walls
 - a) From alveolus, through interstitial fluid (space between cells), into capillaries, and into red blood cells, to hemoglobin

III. Story time: The Heimlich Maneuver

- A. Used to force food out of trachea (diaphragm is forcibly elevated to push food out)
- B. More than 10 years ago - - -
 - 1. Heimlich approached American Red Cross and American Medical Society to get rid of backslap
 - 2. Dr. Edward Patrick did work at Purdue University to look at potential energy
Questionnaire sent out to paramedics, etc. (1200 answers)
 - 3. Results published in Emergency Magazine
 - 4. Helped to justify The Heimlich Maneuver