

General properties of circulatory systems

a circ system has:

- circulatory fluid
- set of interconnection vessels
- muscular pump(s), the **heart**

3 chambered hearts of amphibians

The three chambered hearts of amph and nonavian reptiles are adaptive allowing variation in blood flow through the heart

blood

connective tissue

consists of cells suspended in liquid matrix called **plasma**

plasma ~55% cells~45%

plasma water

cellular elements leukocytes, platelets, and erythrocytes

Gas exchange and respiratory surfaces

gas exchange supplies O₂ for cellular respiration and disposes of CO₂

occurs via diffusion

accomplished via large, moist resp surfaces between cells and medium

things like skin, gills, tracheae, lungs

Circulatory Systems

open closed

single and double circulation

single

fluid leaving heart travels to respir. organs and organ system before returning to heart

double

two different circuits

pulmonary: lung capillaries

systemic: body capillaries

parts of heart/circ system

arteries carry blood AWAY from heart to pulmonary (deoxygenated) & systemic circuits (oxygenated)

veins carry blood back to heart from pulmonary and systemic circuits

pulmonary circuit pulmonary arteries

pulmonary veins

systemic circuit aorta

superior and inferior vena cava

ventilation

breathing process that ventilates the lungs; alternate inhalation and exhalation of air

mechanisms vary across taxa

Closed Circulatory Systems

cardiovascular system

circulatory fluid: blood

interconnected vessels: arteries, arterioles, capillaries, venules, veins

pump: heart

gas exchange mechanism gills/lungs

blood has to get to:

respiratory tissue pulmonary circuit

organ systems systemic circuit

respiratory pigments

proteins that transport oxygen; greatly increase the amount of O₂ that blood can carry

hemoglobin, myoglobin, hemocyanin

hemoglobin resp. pigment w/ high affinity for O₂

Bohr shift: CO₂ decreases pH and the affinity of hemoglobin for O₂

hemoglobin can bind CO₂ but most is transported in plasma

Disorders of circ system

>50% of deaths in US

cardiovascular disease disorder of heart and or blood vessels

atherosclerosis: buildup of plaques in arteries

heart attack blockage of 1 or more coronary arteries

stroke rupture or blockage of arteries to brain

hypertension high BP, increases risk of plaque buildup and heart attack