

Where do RBC, WBC, and platelets come from?

RBC	bone marrow
WBC	bone marrow, (B cells: T Cells:thymus gland)
Platelets	bone marrow

Flow of Blood

Left Ventricle->Pulmonary Artery->Lung->Capillaries-> Pulmonary Vein->Left Atrium->Left Ventricle->Aorta->Aorta Diverges->Blood deliver to upper or lower party->blood returns to the right atrium (upper:superior vena cava/lower:inferior vena cava)->right Ventricle

3 Kinds of Vessels

Arteries	Arteroles
Veins	-Venules
Capillaries	Capillary Beds

Veins: bring blood to the heart

Pulmonary Vein	from <i>lungs to heart</i>
Superior Vena Cava	from <i>upper body to heart</i>
Inferior Vena Cave	from <i>lower body to heart</i>

Arteries carry blood away from the heart

Pulmonary Artery	away from the <i>heart to the lungs</i>
Aorta	away from <i>heart to body</i>

Heart Beat

Diastole entire heart is relaxed

Systole Atria contract, ventricles contract

Heart Rate number of beats per minute

Pumping a series of contraction and relaxation of the heart muscle

Cardiac Muscles contract and relax **without** stimulation from the nervous system (SA node/pace maker)

Cardiac Output volume of blood pumped by a ventricle per minute

Heart Attack

damage or death of the cardiac muscle due to blockage of a coronary artery

Primary vs. Secondary Immune Response

Primary occurs upon first exposure to an antigen, slower than the secondary immune response, produces effector cells and memory cells that may confer lifelong immunity

Secondary memory cells are activated by a second exposure to the same antigen, initiates a faster and stronger response

Urea vs Ammonia

Urea (is from the breakdown of proteins) produced in the vertebrate liver by combining ammonia and carbon dioxide, less toxic, easier to store, highly soluble in water

Ammonia poisonous, to toxic to be store in the body, soluble in water, easily disposed of by aquatic animals, results from breakdown of amino acids from protein

Fuctional unit of the Kidney

The nephron

Trace Urine Through the Urinary System

Glomerular capsule, PCT, descending limb of loop of Henle, ascending limb of loop of Henle, DCT, collecting tubule, papillary duct of renal papillae, minor calyx, major calyx, renal pelvis, ureter, bladder, urethra

Flow of Filtrate through the Nephron

glomerular capsule, Proximal Convoluted tubule (PCT), Loop of Henle, Distal Convoluted tubule (DCT), Collecting duct

Processes of the Nephron

Filtration blood pressure forces water and many small molecules through a capillary wall into the start of the capsular space

Processes of the Nephron (cont)

Reabsorption refines the filtrate, reclaims valuable solutes (glucose, salt and amino acids) from filtrate, returns these to the blood, most reabsorption occurs in the PCT

Secretion substances in the blood are transported into the filtrate.

Excretion the final product, urine, is excreted via the ureters, urinary bladder and urethra

APC

a foreign antigen (a nonself molecule) and one of the body's own self proteins, to a helper T Cel

2 Divisions of the Nervous System

central nervous system (CNS) which consists of the brain and the spinal cord

peripheral nervous system (PNS) consists of nerves and small concentrations of gray matter called ganglia.

Myelin

enclose axons, form cellular insulation, speed up signal transmittion, is a lipoprotein, is white matter

<p>Neurotransmitters</p> <p>Acetylcholine in the brain and in the synapses between motor neurons and muscle cells</p> <p>Biogenic amines important transmitters in the CNS and include serotonin and dopamine, which affect sleep, mood and attention</p> <p>Neuropeptides consist of relatively short chains of amino acids important in the CNS and include endorphins, decreasing our perception of pain</p> <p>Nitric Oxide is a dissolved gas and triggers erections during sexual arousal in men</p>	<p>Parts of the brain (cont)</p> <p>thalamus (Cerebellum) relay center for most senses deal with both emotions and most senses</p> <p>medulla oblongata (Brainstem) controls breathing, heart rate, & swallowing</p> <p>pons (Brainstem) bridge between forebrain and cerebellum, controls breathing, many important nerves originate here</p> <p>midbrain (Brainstem) coordinates visual and auditory reflexes</p>	<p>Anatomy of a Long Bone</p> <p>Fat-storing central cavity (Medullary Cavity) contains yellow marrow (fat)</p> <p>Spongy bone located at the ends of bones, contains red bone marrow, the site of blood cell production (WBC's, RBC's and platelets)</p>	<p>Calcium</p> <p>What does it do? initiates muscle contraction by moving regulatory proteins away from the actin binding sites</p> <p>Where is calcium stored? endoplasmic reticulum</p>
<p>Axons vs Dendrites</p> <p>Axons passes messages from the cell body to other neurons, muscles or glands</p> <p>Dendrites receive messages from other cells</p>	<p>Brain Lobes</p> <p>Frontal Lobe (motor) helps plan movements & involved with personality, control of emotions and expression of emotional behavior</p> <p>Temporal Lobe Association center for hearing and smell</p> <p>Occipital Lobe Association centers for vision</p> <p>Parietal Lobe Association area for touch</p>	<p>Joints</p> <p>sutures allow no movements (ex. skull and pelvis)</p> <p>ball-and-socket allow for the greatest range of motion (ex. shoulder and hip)</p> <p>hinge joint uniaxle, allow for movement in one plane (ex. elbow and interphalangeal)</p> <p>pivot (ex. radioulnar & atlantoaxial)</p>	<p>Anaerobic Metabolism vs Aerobic metabolism</p> <p>Anaerobic Metabolism The amount of energy generated by anaerobic metabolism is less than one-tenth of what is produced by aerobic metabolism.</p> <p>Aerobic metabolism provides most of the ATP used to power muscle movement during exercise</p>
<p>Parts of the brain</p> <p>hypothalamus (Cerebellum) controls pituitary and ANS, therefore controls homeostasis</p>	<p>Axial vs Apendicular Skeleton</p> <p>Axial skull, vertebrae, ribs</p> <p>Apendicular shoulder and pelvic girdles, arms and legs</p>	<p>Thick vs Thin Filament</p> <p>Thick made of myosin</p> <p>Thin made of actin(mostly), troponin, tropomyosin binding sites on actin (at rest)</p>	<p>Motor Unit</p> <p>consists of a neuron, the set of muscle fibers it controls</p>
			<p>Fast vs Slow Fibers</p> <p>Fast Fibers high proportioned in fingers and eyes (white fibers)</p> <p>Slow Fibers high proportion in postural muscles (red fibers)</p>

