

# 2022 anatomy exam review!

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## Introduction

° levels of organization = chemical, cellular, tissue, organ, organ sys-em, organism

### organelles

nucleus stores genetic information

nucleolus makes ribosomes

cytoplasm contains the contents of the cell

ribosome makes protein

rough ER makes proteins for the endomembrane system

smooth ER detoxifies the cell and makes lipids

golgi apparatus sorts and ships proteins

mitochondria makes energy

lysosome removes unwanted material

vacuoles store water and nutrients

vesicles transport materials around the cell

cell membrane a thin flexible barrier that separates the cell from its environment

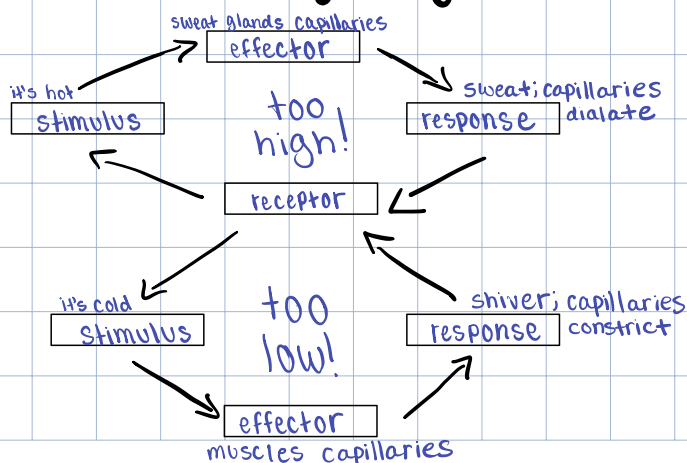
### feedback loops and their parts

positive the output/product of a system intensifies the response

examples: childbirth and fruit ripening

negative the output/product of a system causes a counter response to return to a set point

examples: blood sugar regulation and water concentration (osmolarity)



normal body temperature in a human =  $37^{\circ}\text{C}$  or  $98.6^{\circ}\text{F}$

example = thermoregulation

## cellular transport

diffusion high → low; passive; breathing

facilitated diffusion passive; glucose regulation

osmosis passive; semipermeable membrane; movement of water across the cell membrane

endocytosis active; taking things into the cell

exocytosis active; moving proteins out of the cell

molecular pumps active

## anatomical terms

transverse divides body in ↑ + ↓ parts

dorsal "back side"

ventral "belly side"

proximal closer to the trunk

distal distant or away from

medial middle or in between

lateral away from middle

anterior front of

posterior back of

visceral internal (organs)

parietal external (limbs)

# Tissues

epithelium protection; skin

connective tissue stores fat, helps move nutrients between other tissues and organs; bone, cartilage, fat, blood, lymphatic tissue

nervous tissue coordinating and controlling many bodily activities; brain, spinal cord, nerves

muscle tissue skeletal - movement; cardiac - pumps blood/contracts heart; smooth muscle tissue - very flexible - stomach

# Digestive System

parts of small intestine duodenum - chemical digestion using enzymes; jejunum - absorbs most nutrients; ileum - absorbs bile acids, fluid, and vitamin B-12

parts of large intestine cecum, colon, rectum, anal canal, and anus

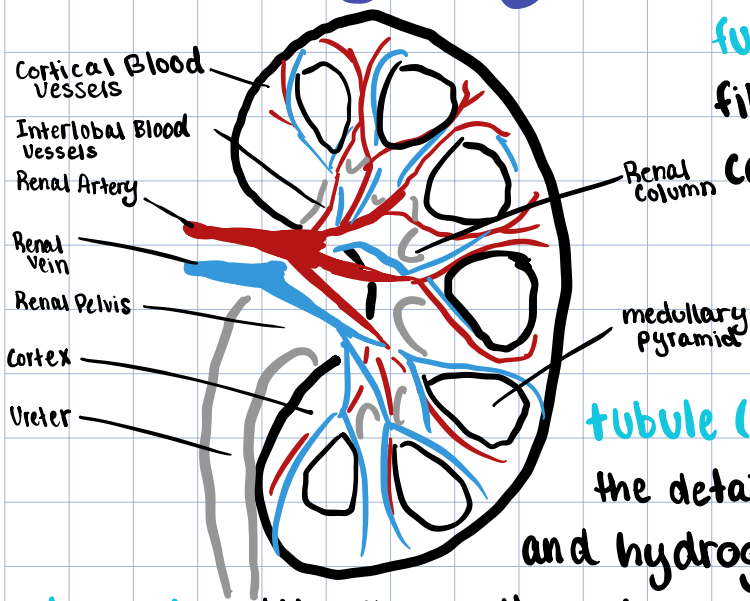
\* mechanical breakdown is the mechanical breakdown of food into small particles, while digestion is the chemical breakdown of food into small

chemical substances

salivary amylase is the primary enzyme in saliva; breaks down carbs

pepsin breaks down proteins

# Urinary System



functional part of kidney - nephron - filters blood and regulates water concentration and soluble substances

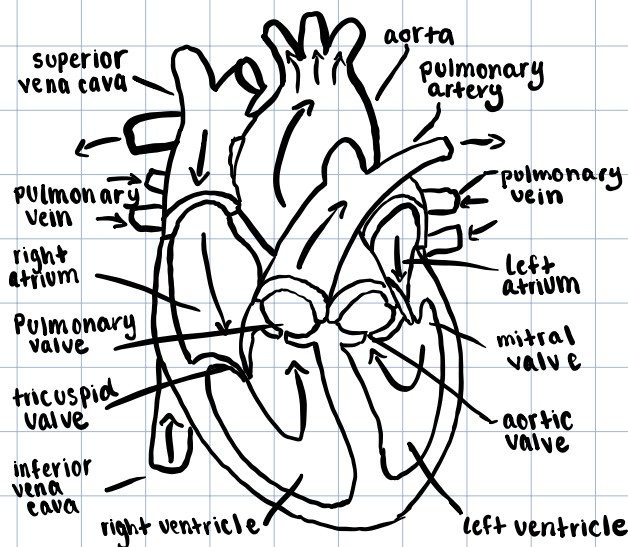
## nephron structures

tubule (proximal) reabsorption of filtrate in accordance with the needs of homeostasis

tubule (distal)/collecting duct concerned with the detailed regulation of water, electrolyte, and hydrogen-ion balance

glomerulus its thin walls allow smaller molecules, wastes and fluid - mostly water - to pass into the tubule. Larger molecules, such as proteins and blood cells, stay in the blood vessel

# Cardiovascular System

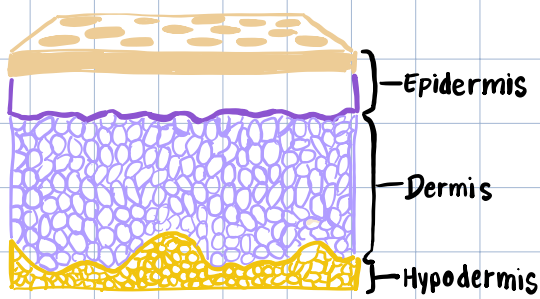


cardiac cycle performance of the human heart from the beginning of one heartbeat to the beginning of the next heartbeat

blood pressure related to the force and rate of heartbeat

myocardium muscular tissue of the heart

# Integumentary System



|                       | eccrine sweat glands                             | apocrine sweat glands   | Sebaceous glands  |
|-----------------------|--|---|---|
| function(s)           | temperature control and antibacterial properties | unknown, potentially sexual scent glands                          | lubricate/soften skin and hair, slow water loss, and antibacterial properties |
| type of secretion     | sweat  | sweat, proteins, and fatty substances                             | Sebum (an oily secretion)   |
| where secretion exits | surface of the skin                              | usually upper part of hair follicle, rarely found on skin surface | usually upper part of hair follicle, sometimes on skin surface                |
| where in the body     | everywhere; extra in palms, soles, and forehead  | axillary and anogenital regions of the body                       | everywhere except on palms and soles  |

## Layers of Skin

**epidermis** outer part of skin

**dermis** where majority of work gets done; embedded with blood vessels, glands, hair follicles, and nerves

**hypodermis** mostly fat; insulation against heat loss, energy storage, shock absorber, and anchors skin to underlying structures

## receptors in skin

**mechanoreceptor** touch

**chemoreceptor** chemicals

**photoreceptor** light

## BURNS

**1<sup>st</sup> Degree Burn** top layer of skin; usually doesn't leave a scar

**2<sup>nd</sup> Degree Burn** epidermis and dermis; swelling; splotchy skin; blisters; scarring

**3<sup>rd</sup> Degree Burn** may reach underlying bones and tendons

# Lymphatic System

**acquired immunity** immunity gained through vaccinations

**antibody** protein made by WBCs in response to an antigen

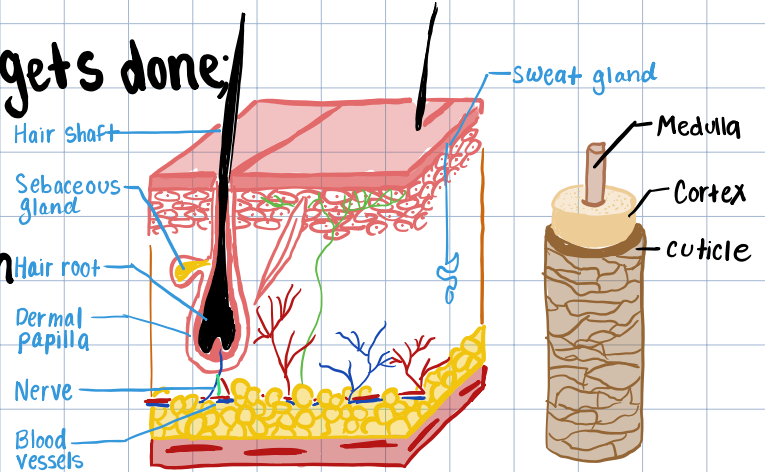
**antigen** a substance that causes the body to make an immune res.

**B cells** develop from stem cells in bone marrow

**immunity** immune sys. way of protecting against disease/infection

**inflammation** response to a cellular injury

**lymphocyte** white Blood Cell w/a single round nucleus



**nociceptor** pain

**thermoreceptor** heat

natural killer

**NK cells** cytotoxic lymphocyte critical to innate immune system

**passive immunity** short-term immunity from vac. or antibiotic

**T cells** originate in bone marrow and mature in the thymus

**thymus** matures T cells

**lymph** keeps body cells moist

**lymph nodes** filter substances traveling through the lymph

**lymph vessels** transports lymph away from tissues

**MALT** initiates immune responses

**spleen** makes WBCs; stores and filters blood

**pathogens** organisms that cause disease and infection

**cell-mediated response** destruction of infected cells by T cells

**humoral response** produces antigen-specific antibodies

## Skeletal system

**appendicular skeleton** everything connected to axial

**axial skeleton** head, neck, back, and chest

**compact bone** dense bone solidly filled with organic ground substances

**spongy/cancellous bone** porous type of bone

**diaphysis** central part of a long bone

**epiphysis** extended end of long bones

**fracture** cracked/broken bone

**ligament** bands of tough elastic tissue around joints

**osteoblast** synthesize bone matrix

**osteoclast** cells that degrade bone

**osteocyte** bone cells

**synovial fluid** found in cavities of synovial joints

**articulation** location where two or more bones meet

## Muscular system

**insertion** the point of attachment where more movement occurs

**origin** the attachment

**tendon** fibrous connective tissue that attaches muscle to bone

**myofilaments** 3 protein filaments in muscle cells

**neuromuscular junction** highly specialized synapse between a motor neuron nerve terminal and its muscle fiber

**prime mover** muscle that provides primary force driving the action

**sarcomere** functional/contractile unit of a muscle fiber

**synergist** act around movable joint

**muscle fatigue** decreases a muscle's ability to perform over time

**fascicle** bundle of muscle fibers; provides pathways for the passage of blood vessels and nerves