



## GENERAL BIOLOGY

### Lec. 5

## HUMAN ANATOMY

STAGE I

BY

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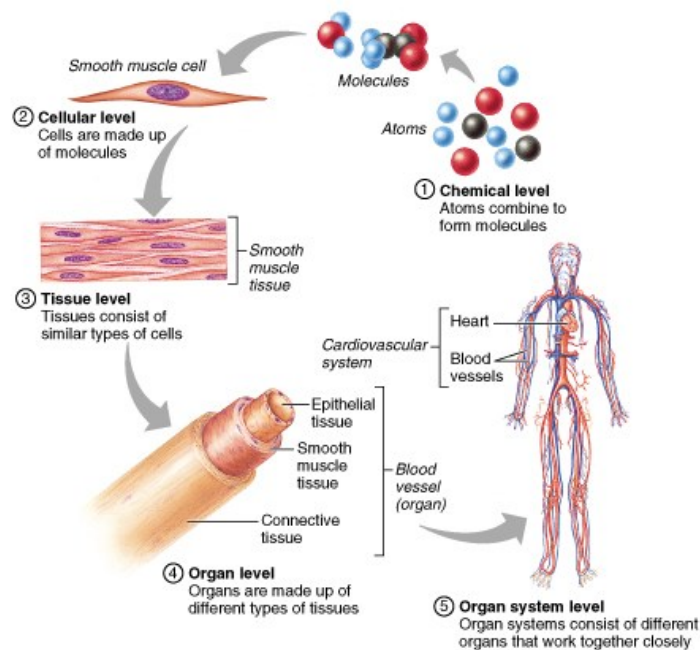
# ANATOMY

Definition: anatome = (ana) up+ (tome) cutting

- **DISCIPLINES**
- Gross Anatomy: structures studied with the naked eye.
  - Systematic anatomy: organized by systems, e.g., digestive, nervous, endocrine, etc.
  - Regional anatomy: study of all structures in an area of the body, e.g., upper extremity bones, muscles, blood
- Microscopic anatomy (histology)
  - Cell biology
- Developmental anatomy (embryology)
  - Pathological anatomy
- Radiologic anatomy (x-ray, CT, MRI)
- Other areas? (surgery)

# Levels of Structural Organization

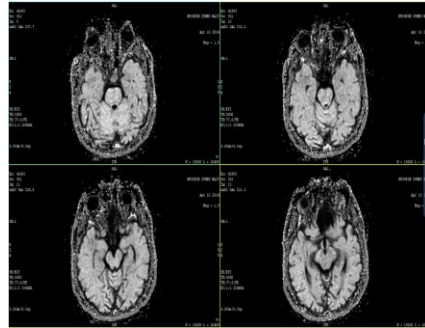
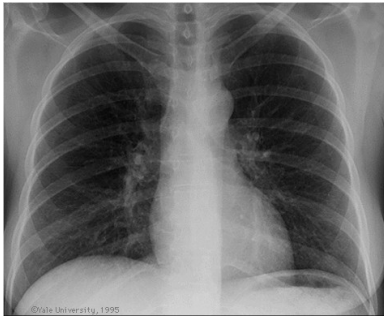
- Biochemical (atoms, molecules)
- Cellular
- Tissue
- Organ
- Organ system
- Organism



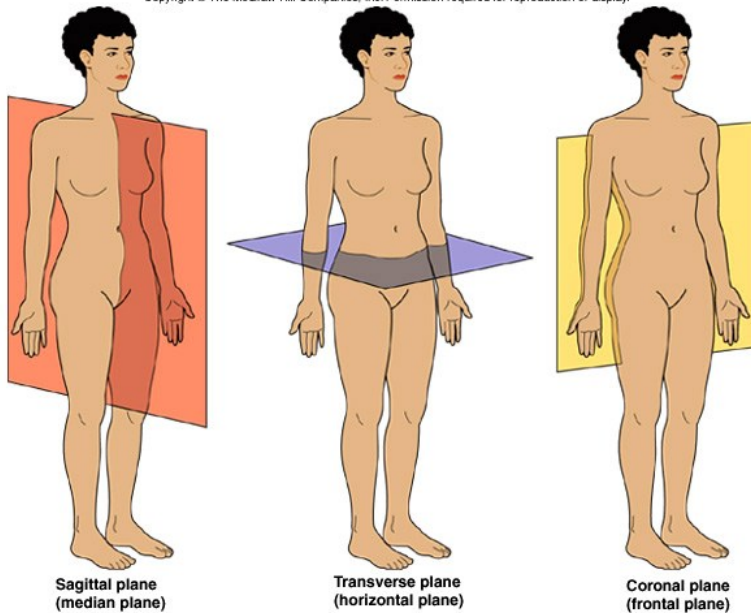
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# Medical Imaging Techniques

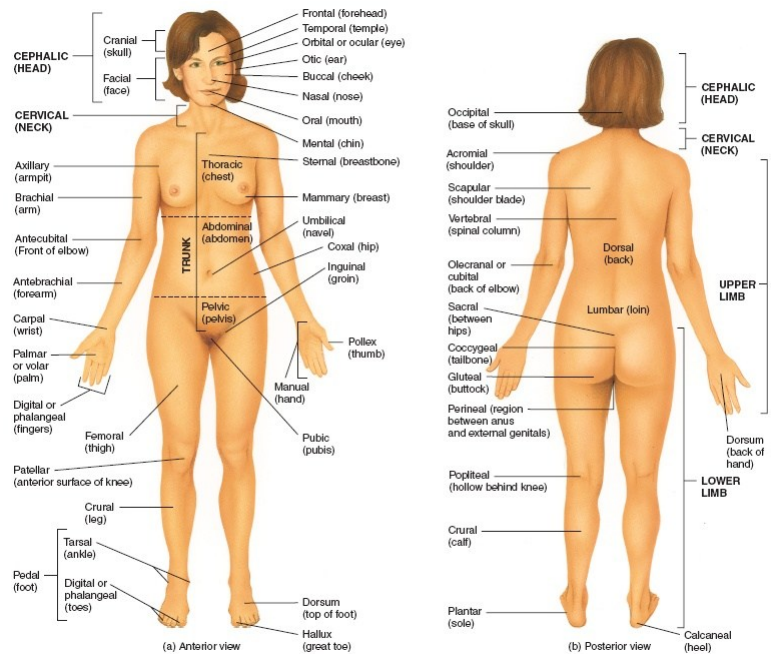
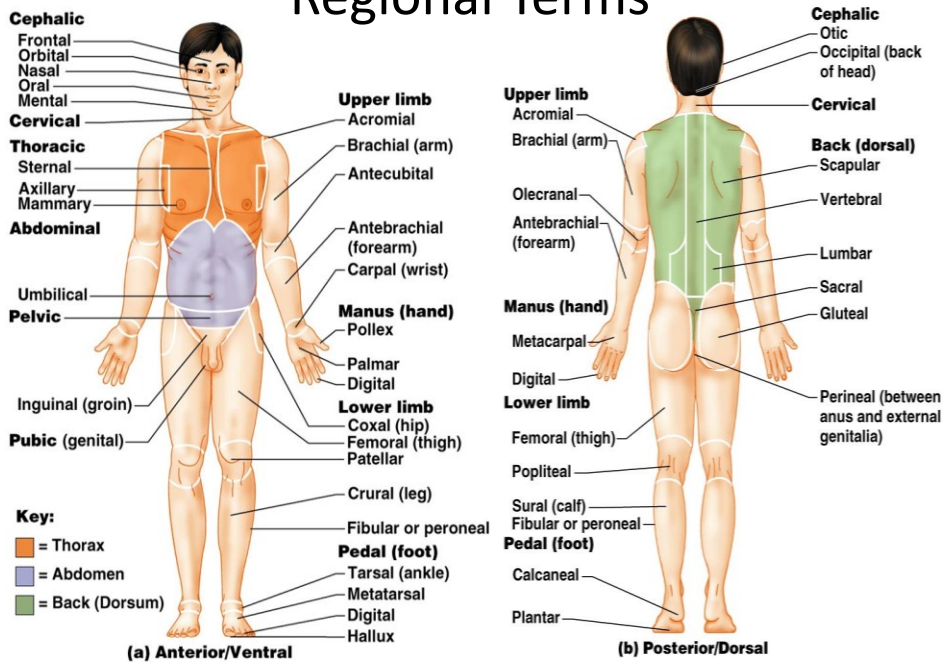
- X-rays
- CT Scan
- Ultrasound imaging
- MRI



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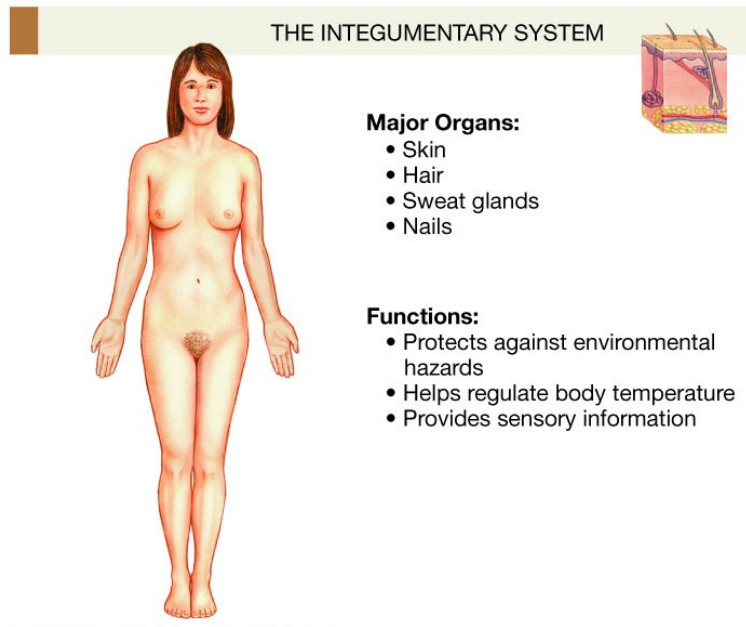
# Regional Terms



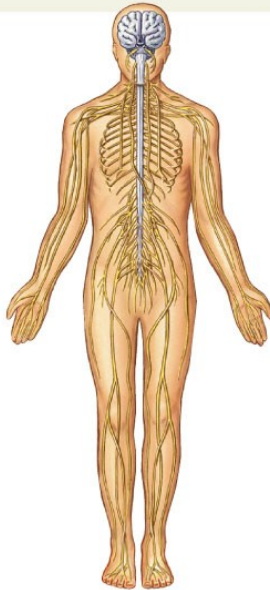
# Systems Physiology

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- Integumentary system
- Nervous system
- Skeletal system
- Endocrine system
- Muscular system
- Cardiovascular system
- Lymphatic system
- Urinary system
- Respiratory system
- Digestive system
- Reproductive system



## THE NERVOUS SYSTEM



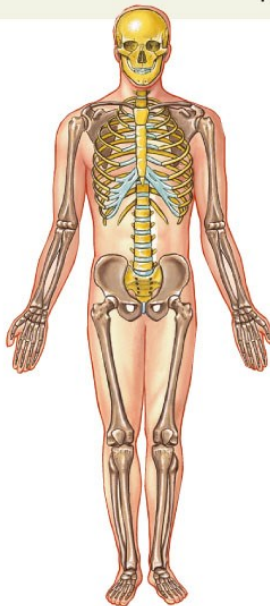
### Major Organs:

- Brain
- Spinal cord
- Peripheral nerves
- Sense organs

### Functions:

- Directs immediate responses to stimuli
- Coordinates or moderates activities of other organ systems
- Provides and interprets sensory information about external conditions

## THE SKELETAL SYSTEM



### Major Organs:

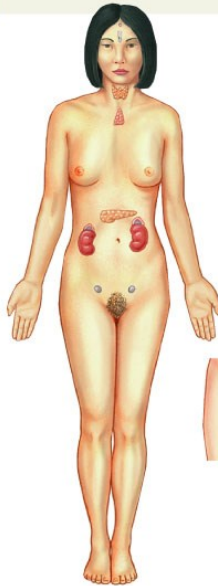
- Bones
- Cartilages
- Associated ligaments
- Bone marrow

### Functions:

- Provides support and protection for other tissues
- Stores calcium and other minerals
- Forms blood cells



## THE ENDOCRINE SYSTEM



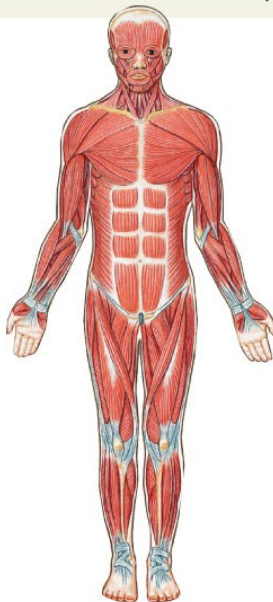
### Major Organs:

- Pituitary gland
- Thyroid gland
- Pancreas
- Adrenal glands
- Gonads (testes and ovaries)
- Endocrine tissues in other systems

### Functions:

- Directs long-term changes in the activities of other organ systems
- Adjusts metabolic activity and energy use by the body
- Controls many structural and functional changes during development

## THE MUSCULAR SYSTEM



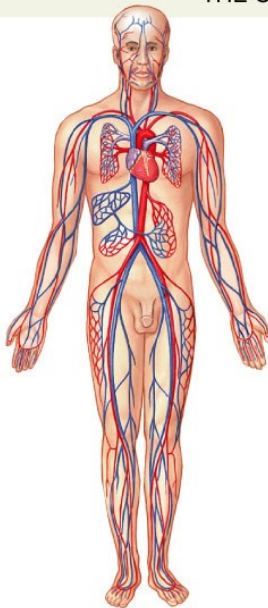
### Major Organs:

- Skeletal muscles and associated tendons and aponeuroses (tendinous sheets)

### Functions:

- Provides movement
- Provides protection and support for other tissues
- Generates heat that maintains body temperature

## THE CARDIOVASCULAR SYSTEM



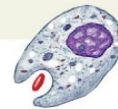
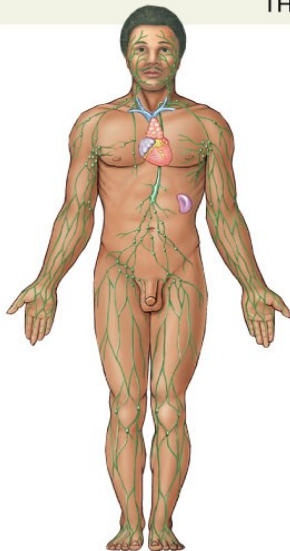
### Major Organs:

- Heart
- Blood
- Blood vessels

### Functions:

- Distributes blood cells, water, and dissolved materials, including nutrients, waste products, oxygen, and carbon dioxide
- Distributes heat and assists in control of body temperature

## THE LYMPHATIC SYSTEM



### Major Organs:

- Spleen
- Thymus
- Lymphatic vessels
- Lymph nodes
- Tonsils

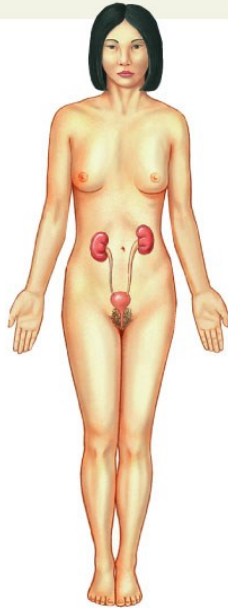
### Functions:

- Defends against infection and disease
- Returns tissue fluids to the bloodstream

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## THE URINARY SYSTEM



### Major Organs:

- Kidneys
- Ureters
- Urinary bladder
- Urethra

### Functions:

- Excretes waste products from the blood
- Controls water balance by regulating volume of urine produced
- Stores urine prior to voluntary elimination
- Regulates blood ion concentrations and pH

## THE RESPIRATORY SYSTEM



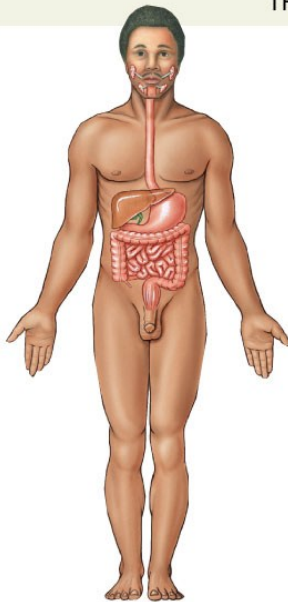
### Major Organs:

- Nasal cavities
- Sinuses
- Larynx
- Trachea
- Bronchi
- Lungs
- Alveoli

### Functions:

- Delivers air to alveoli (sites in lungs where gas exchange occurs)
- Provides oxygen to bloodstream
- Removes carbon dioxide from bloodstream
- Produces sounds for communication

## THE DIGESTIVE SYSTEM



### Major Organs:

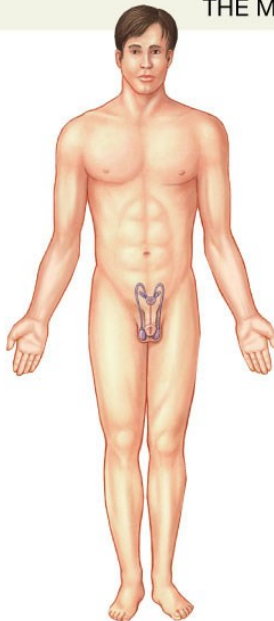
- Teeth
- Tongue
- Pharynx
- Esophagus
- Stomach
- Small intestine
- Large intestine
- Liver
- Gallbladder
- Pancreas



### Functions:

- Processes and digests food
- Absorbs and conserves water
- Absorbs nutrients (ions, water, and the breakdown products of dietary sugars, proteins, and fats)
- Stores energy reserves

## THE MALE REPRODUCTIVE SYSTEM



### Major Organs:

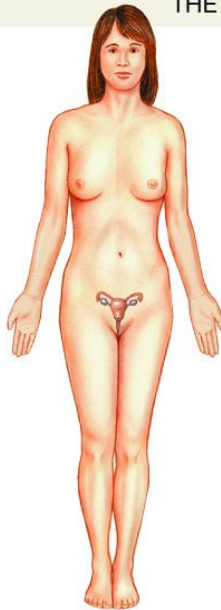
- Testes
- Epididymis
- Ductus deferens
- Seminal vesicles
- Prostate gland
- Penis
- Scrotum



### Functions:

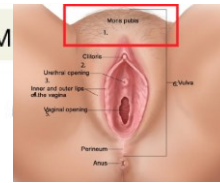
- Produces male sex cells (sperm) and hormones

## THE FEMALE REPRODUCTIVE SYSTEM



### Major Organs:

- Ovaries
- Uterine tubes
- Uterus
- Vagina
- Labia
- Clitoris
- Mammary glands



### Functions:

- Produces female sex cells (oocytes) and hormones
- Supports developing embryo from conception to delivery
- Provides milk to nourish newborn infant