

Human Anatomy and Physiology (ANAT 5)

Mrs. Fulton

Phone: 645-1300 ext. 6049

Please, read your green sheets.

Lecture #1

A. Definitions: anatomy, physiology

B. Requirements of an Organism

C. Homeostasis

D. Levels of Organization

E. Terminology

-anatomical positions & directions, planes, cavities

F. Organ Systems

A. DEFINITIONS

1) Anatomy

-study the structure of the body

2) Physiology

-study function

Definitions (con't)

3. Anatomy & Physiology

- Often studied as a pair
- STRUCTURE & FUNCTION are linked

Examples: -teeth (molars vs. canines)

(Fig 1.2)

B. Requirements of an Organism

1. Water
 - most abundant chemical in body
 - metabolism, transport, temperature reg.
2. Food
 - nutrients (chemicals from environment)
 - energy, building blocks.
3. Oxygen
 - gas (1/5 of “air”), needed for metabolism
4. Heat
5. Pressure

B. Requirements of an Organism (con't)

It's NOT enough to have only these 5 things!

- we need a specific amount of each one
- there is a narrow window that is acceptable
- we need a stable internal environment

What happens if we have too much or too little?

1. Water
2. Food
3. Oxygen
4. Heat

When all of these are present in appropriate amounts, the body functions efficiently & the internal environment is stable.

This is called **HOMEOSTASIS**

C. HOMEOSTASIS

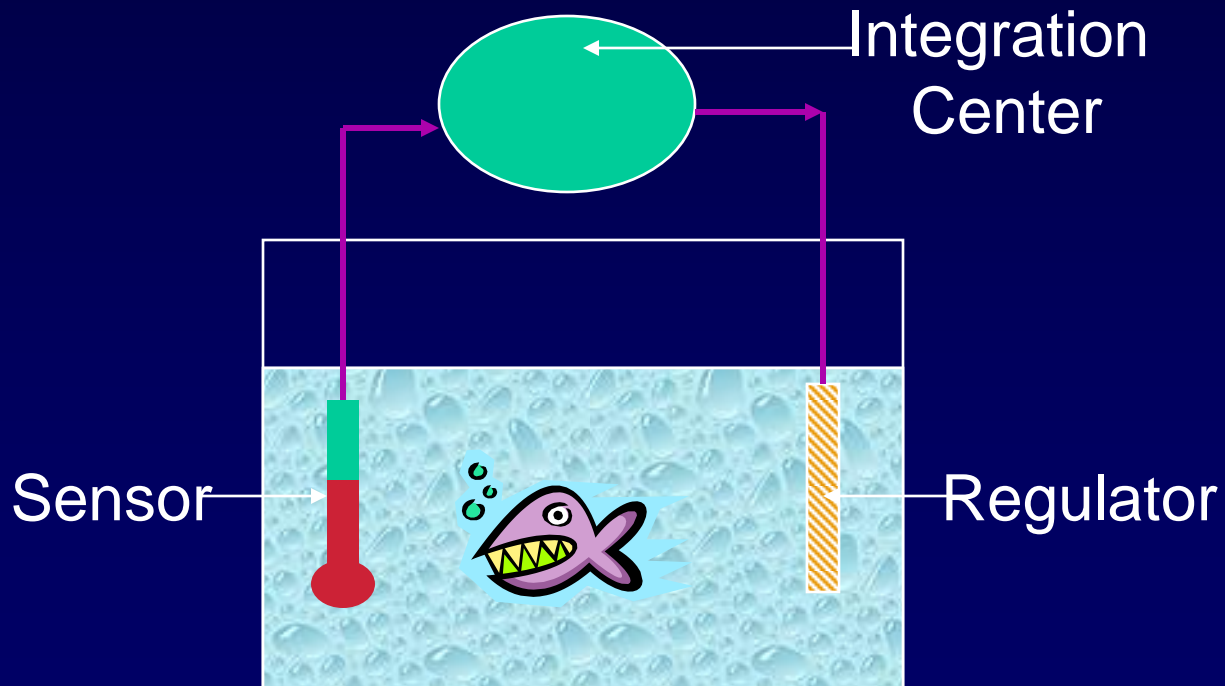
Homeostasis (*homeo* = same; *stasis* = to stay)

- maintenance of a constant internal environment
- a central theme in physiology

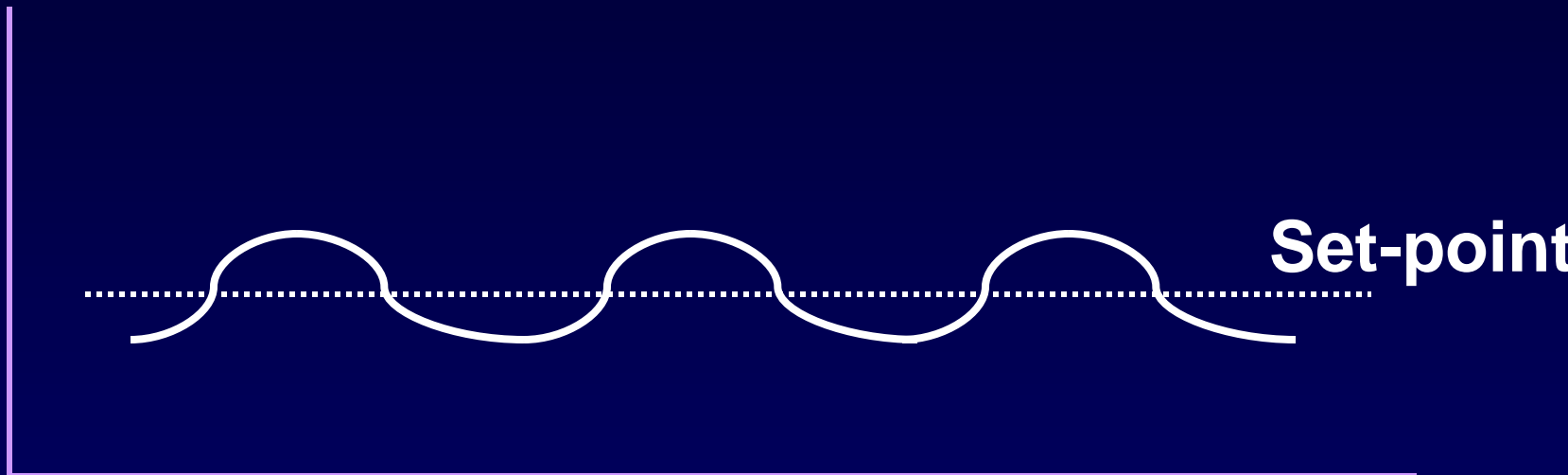
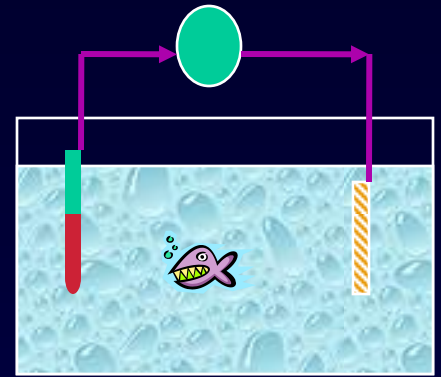
Figures: 1.3 to 1.5 in 8th & 9th edition

Homeostasis

A stable internal environment



Homeostasis



Fluctuation above & below optimal set-point

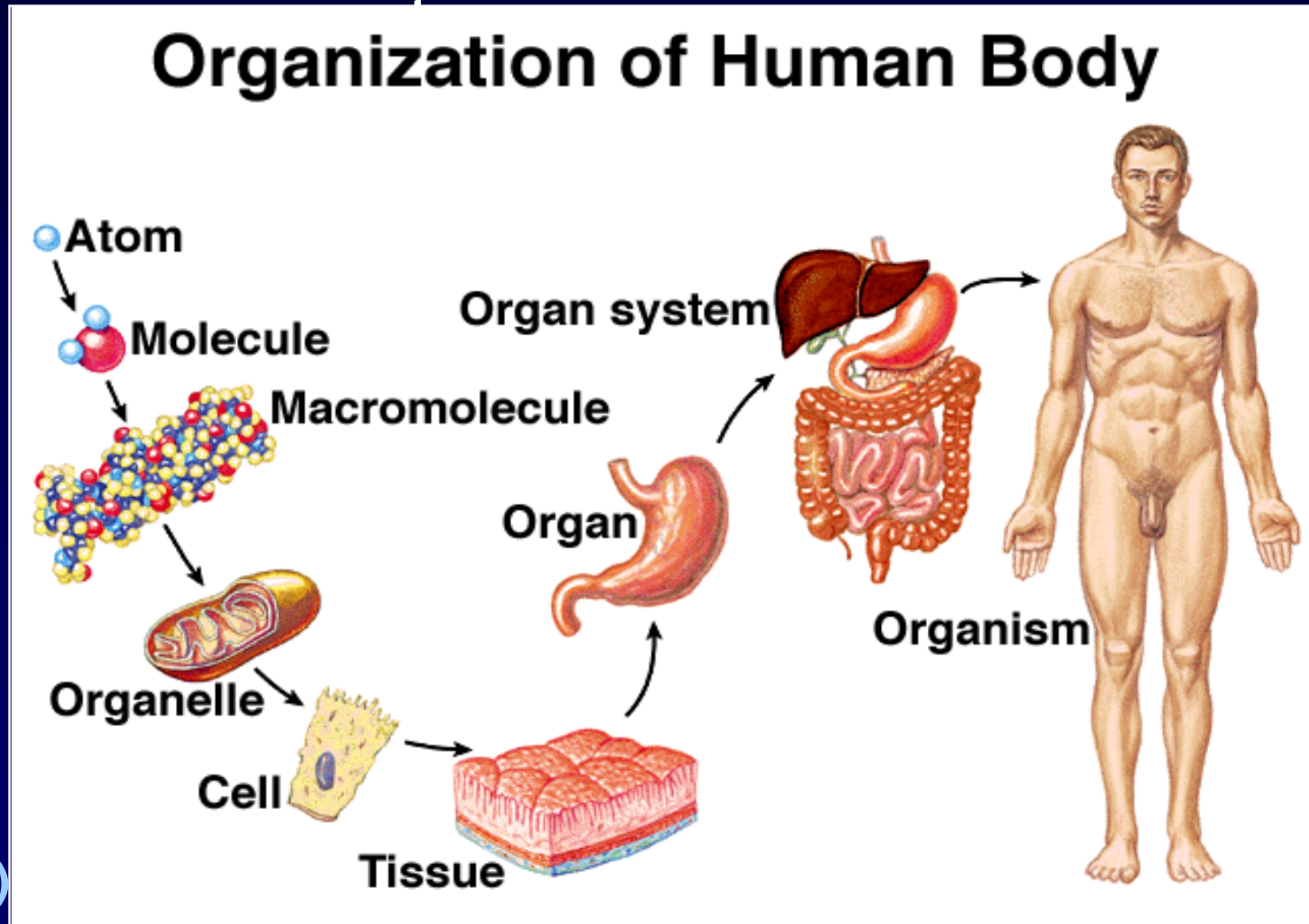
-Temp. too cold = heating coil "ON" = heat up

-Temp. too warm = heating coil "OFF" = cool down

-NEGATIVE FEEDBACK

D. LEVELS OF ORGANIZATION

Break down body into smallest



(Fig 1.6)

COMPONENTS OF THE BODY

1. Cells -

2. Fluids -

It can be divided into:

a) intracellular H₂O

b) extracellular H₂O

1) plasma

2) lymph

3) interstitial fluid

3. Intercellular substances

E. TERMINOLOGY

1. Anatomical position

- facing forward, hands at side, palms forward

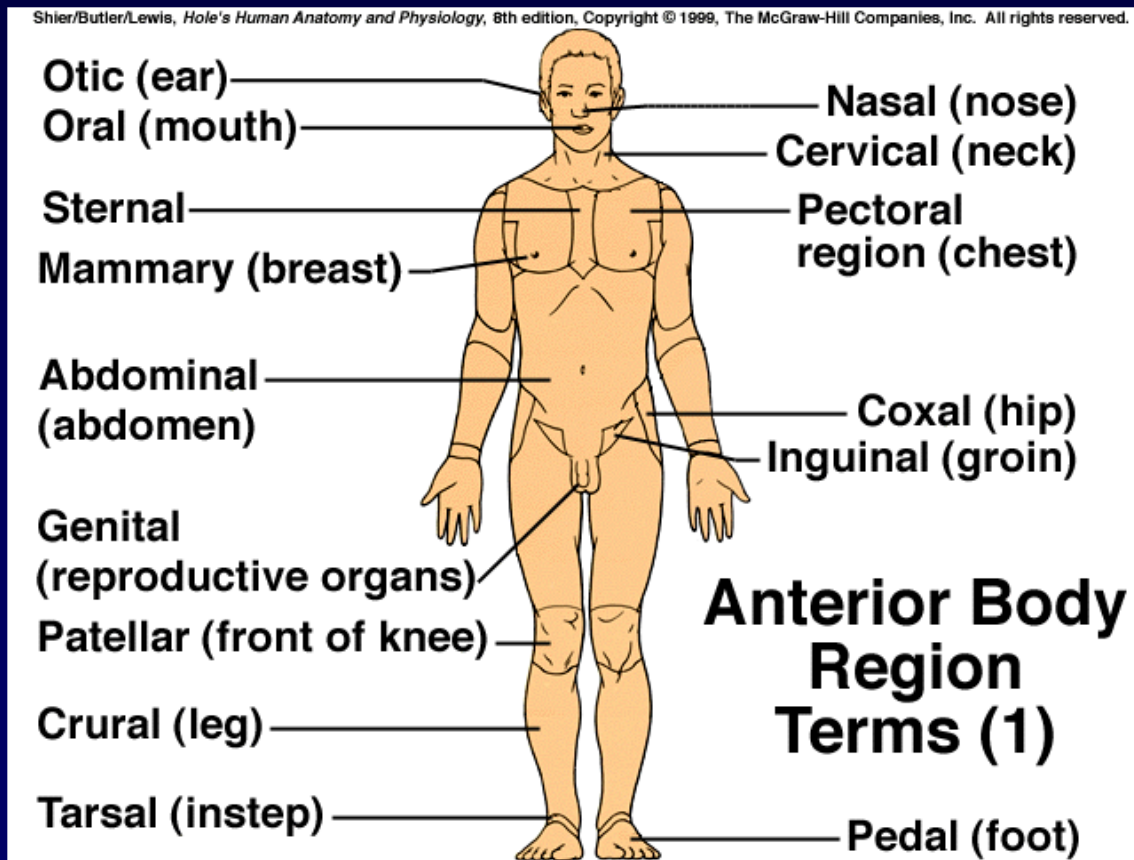


Fig 1.14

E. TERMINOLOGY (con't)

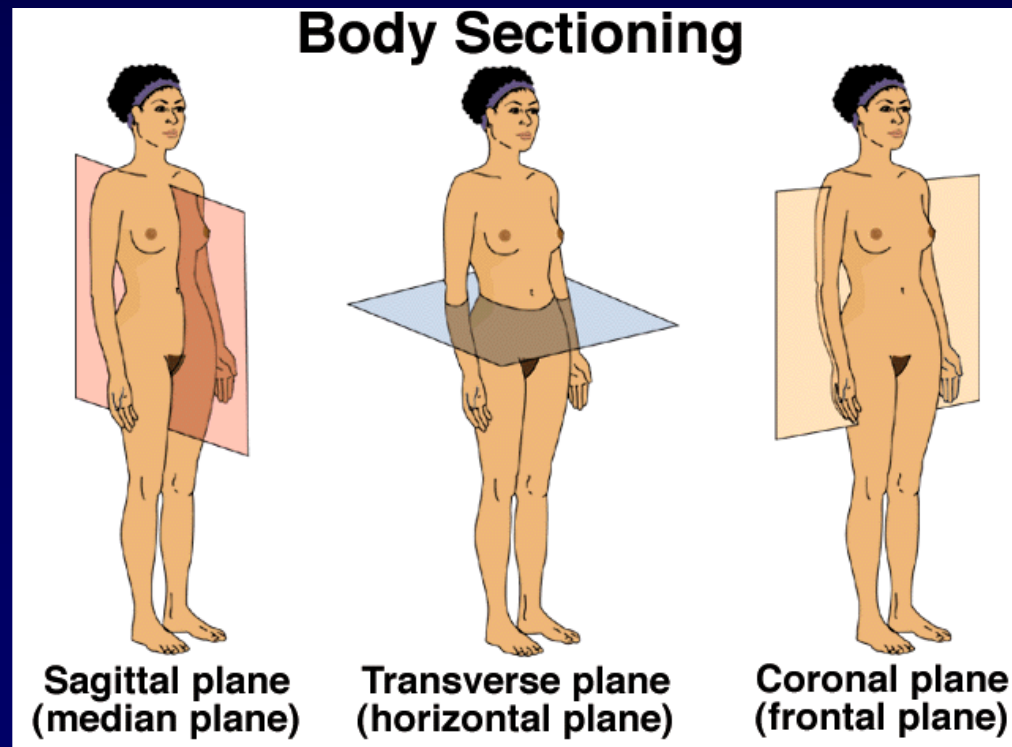
2. Directional Terms: (on p. 13)

- a) superior (cranial) - towards the head
- b) inferior (caudal) - towards the feet
- c) anterior (ventral) - towards the front
- d) posterior (dorsal) - towards the back
- e) medial - towards the midline
- f) lateral - away from the midline
- g) proximal - nearest the point of attachment
- h) distal - farthest from point of attachment
- i) superficial – close to the surface

E. TERMINOLOGY (con't)

3. Planes of the body - ways you can section (cut) body

- a) transverse (horizontal) - superior/inferior
- b) sagittal (vertical, median) – left/right (midsagittal)
- c) coronal (frontal) – ventral/dorsal



(Fig 1.11)

4. Body cavities - 2 major cavities:

a) Ventral cavity - divided by diaphragm into:

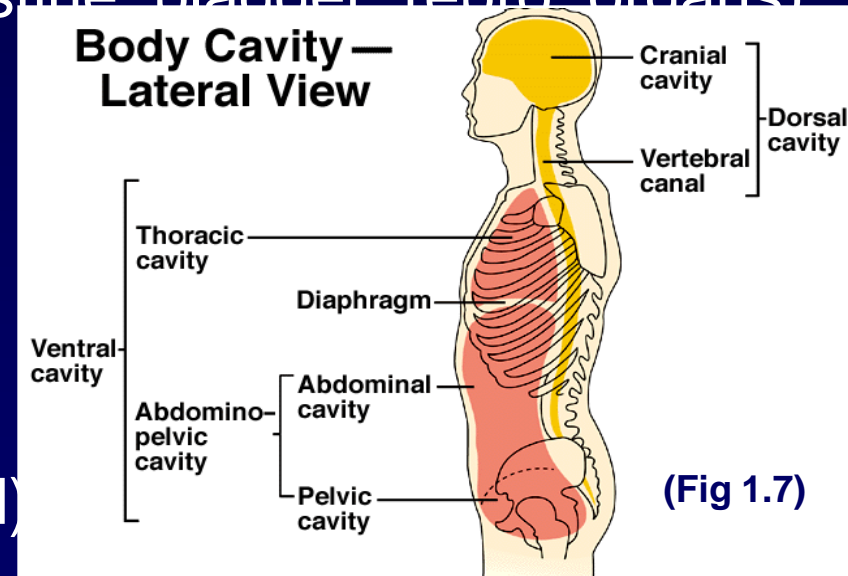
- i) thoracic
- ii) abdominopelvic

abdominal (stomach, liver, gallbladder, spl. intestine, most of lg. intestine)

pelvic (end of lg. intestine, bladder, repro. organs)

b) Dorsal cavity

- i) cranial cavity (brain)
- ii) spinal cavity (spinal cord)



F. SYSTEMS OF THE BODY

- Group of organs working together.
- There are 11 systems in the body.

To Know:

- names
- parts/structure
- functions

SYSTEMS

- 1) Integumentary
- 2) Skeletal
- 3) Muscular
- 4) Nervous
- 5) Endocrine
- 6) Digestive
- 7) Respiratory
- 8) Cardiovascular
- 9) Lymphatic
- 10) Urinary
- 11) Reproductive

Integumentary

Skin

Associated structures:

Hair, glands, nails and nerves.

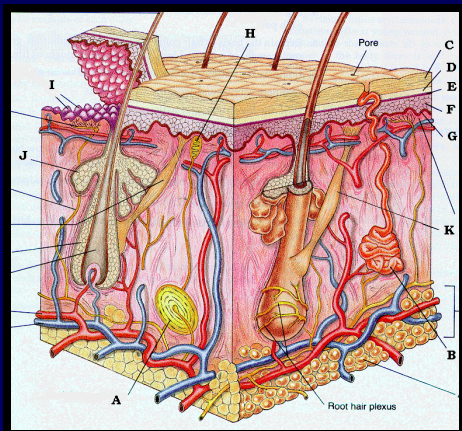
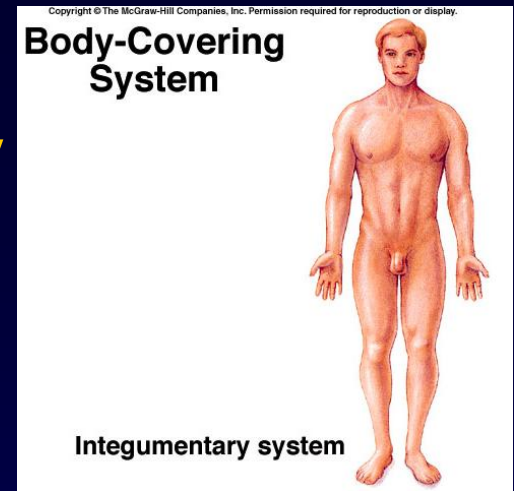
Functions = -Protection (2 kinds)

*disease & injury

-Temperature Regulation

-Sensory Perception

-Product Synthesis



Skeletal System



Bones

Cartilage and ligaments

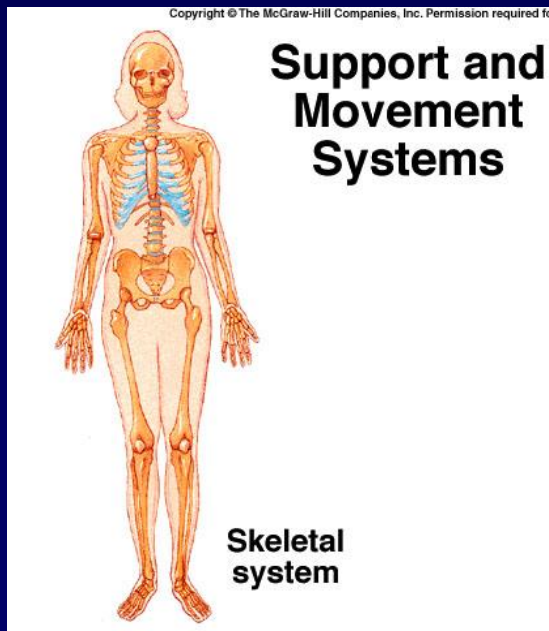
Functions = -Support

-Movement

-Blood production

-Protection

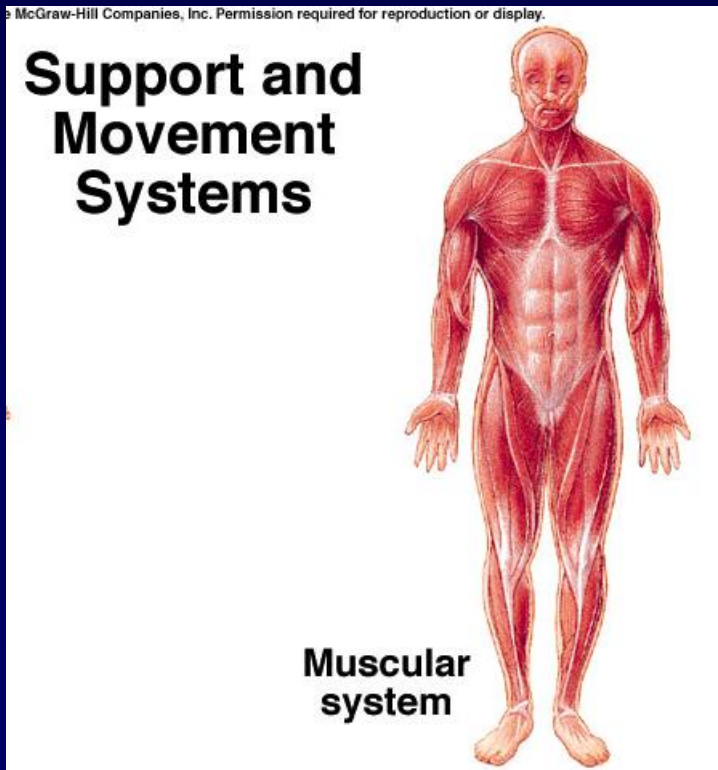
-Mineral Storage



Muscular System

Functions = -Movement

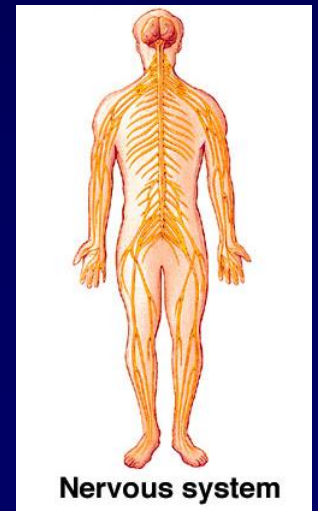
-
-



Nervous System

Brain, spinal cord, nerves, sensory organs

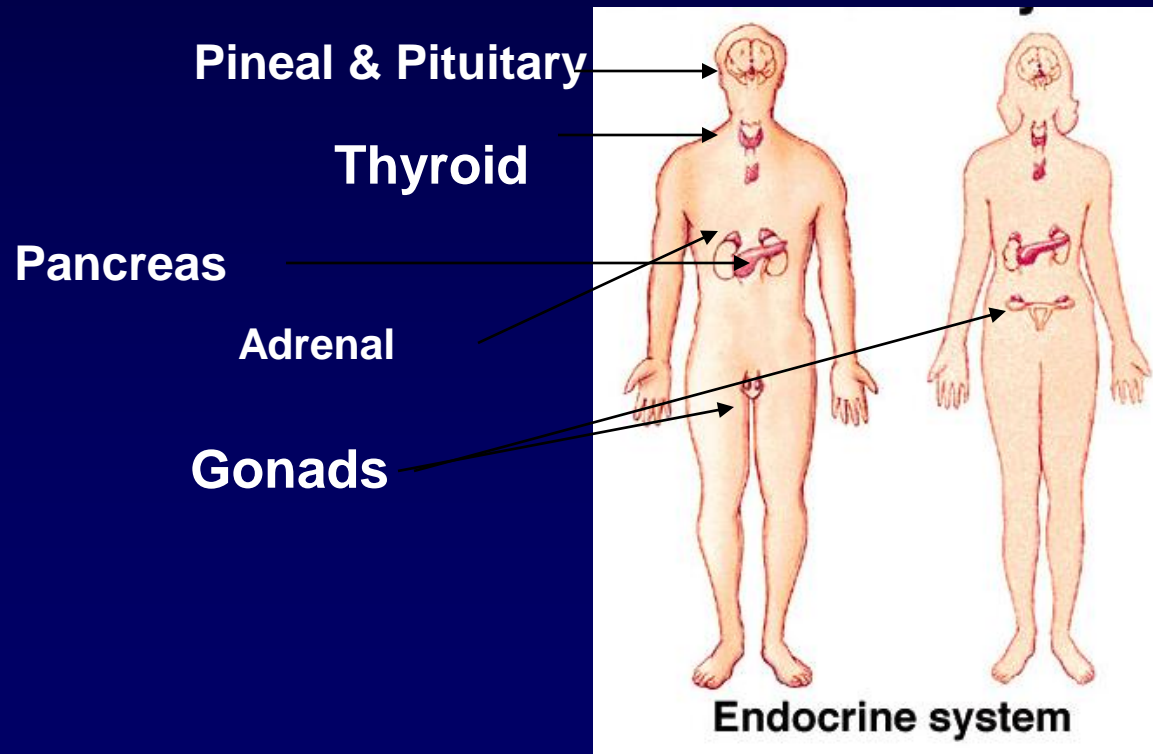
Use electrochemical signals to control
body



Endocrine System

All glands that make hormones

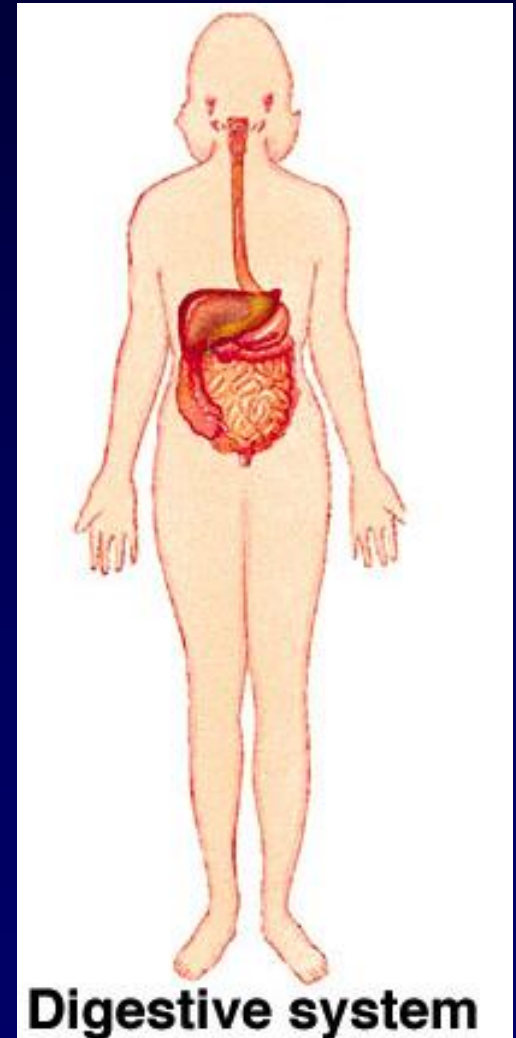
What is a hormone?



Digestive System

What organs are included?

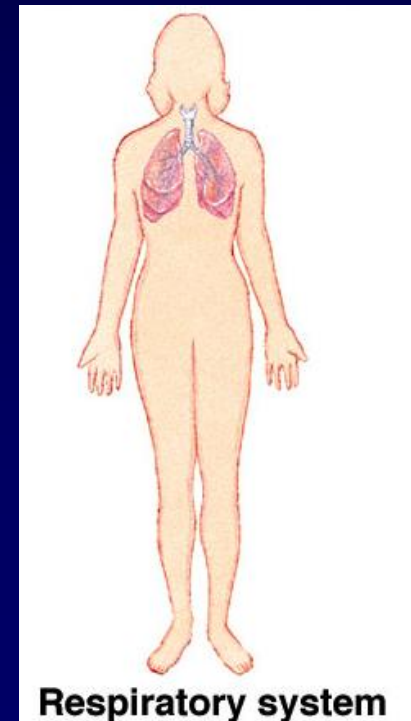
Functions: digestion
 absorption
 excretion



Respiratory System

Nasal cavity, trachea, bronchi, lungs

Function: gas exchange



Circulatory System

Heart, Vessels, Blood

Function = transport

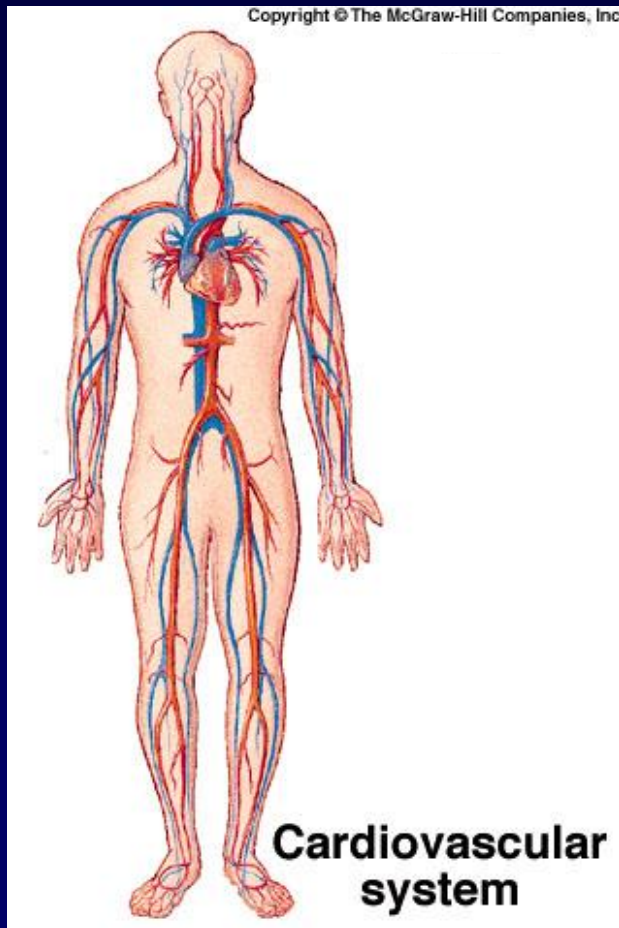
O_2

food

waste

hormones

immune system cells



Lymphatic System

Connected to blood system.

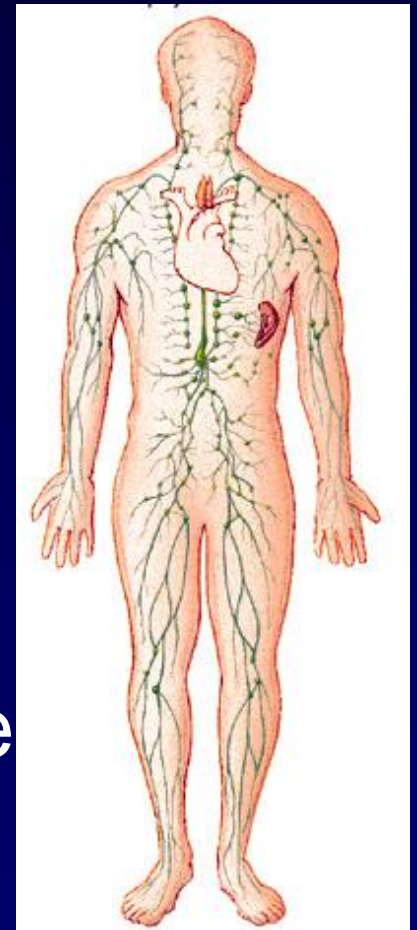
Lymph vessels

Lymph fluid

Lymph nodules

Thymus and Spleen

Function = Fight Infection/Disease

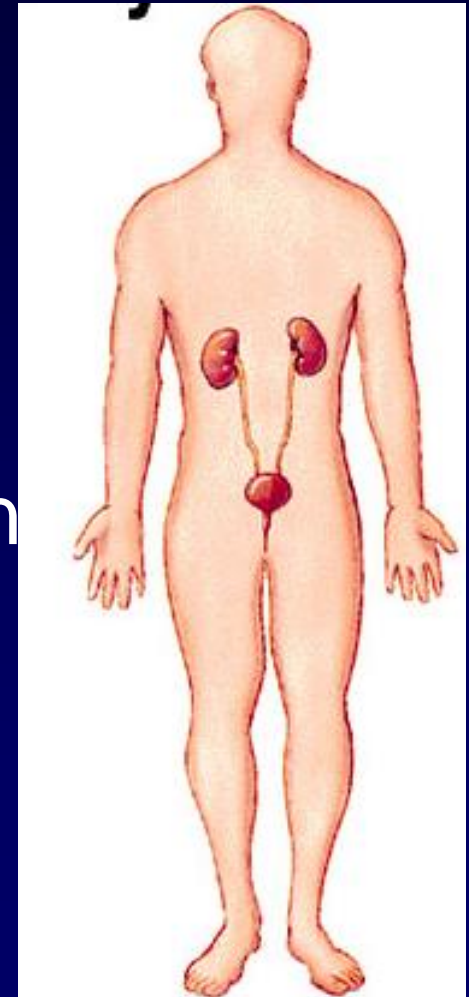


Urinary System

Kidneys, bladder, ducts

Functions =

- remove wastes
- water balance
- acid/base balance

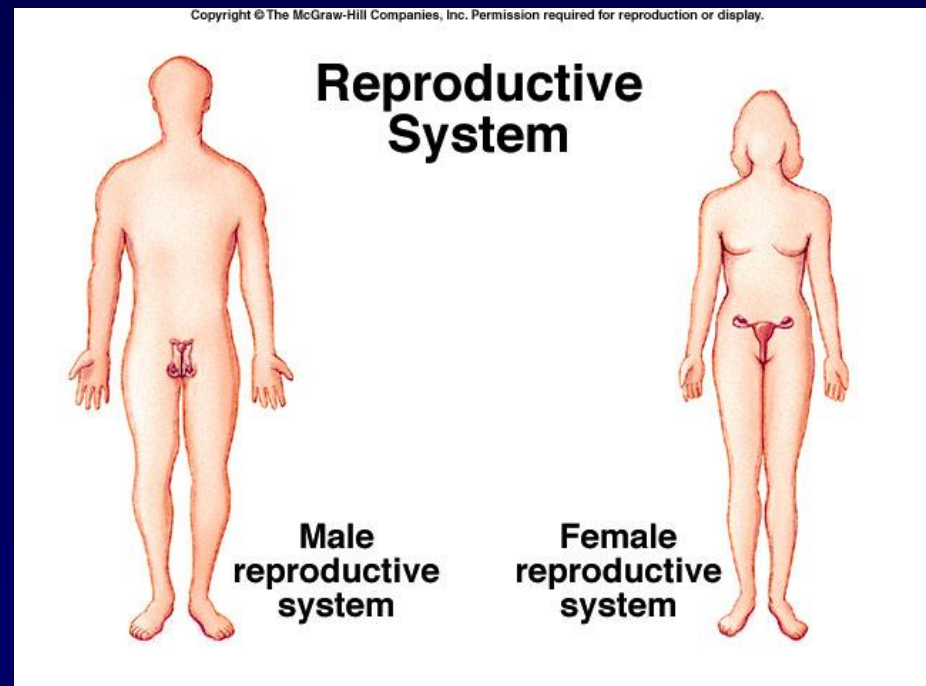


Urinary system

Reproductive Systems

Internal and External Organs

Function = propagation of the species



End of Introduction & Organ Systems

(go to Chemistry)