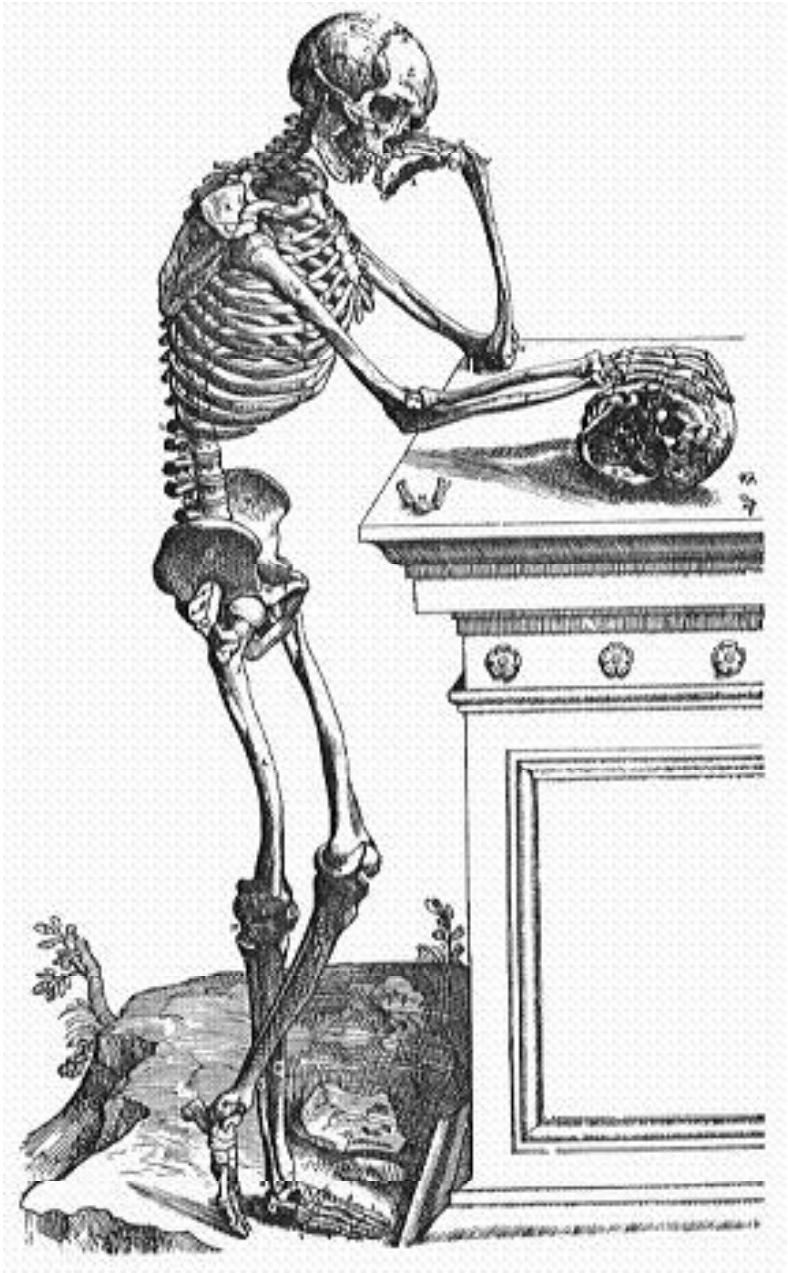
Human Physiology



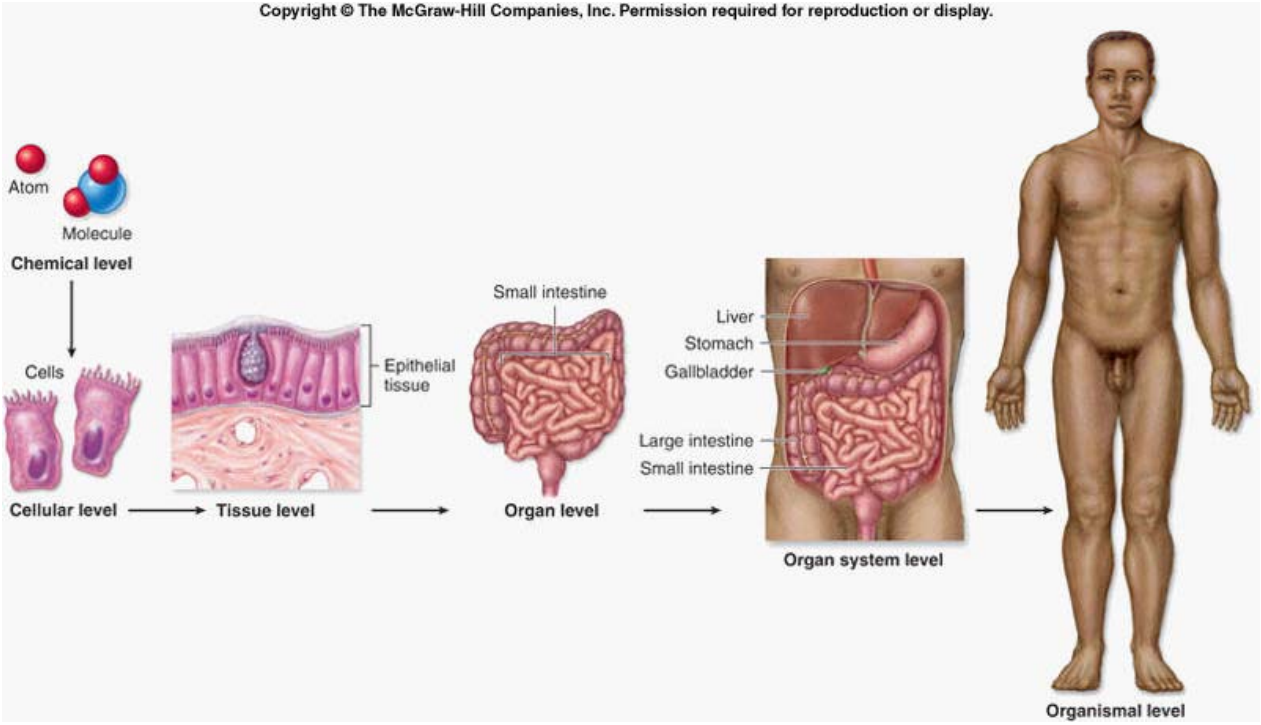
What Is Physiology?

- The study of functionality of living organisms at the cellular, organ, and systemic levels.
- It is the science of body functions.

- *Physis*- nature
- *Ology*- branch of learning

Let's review the level of organization…

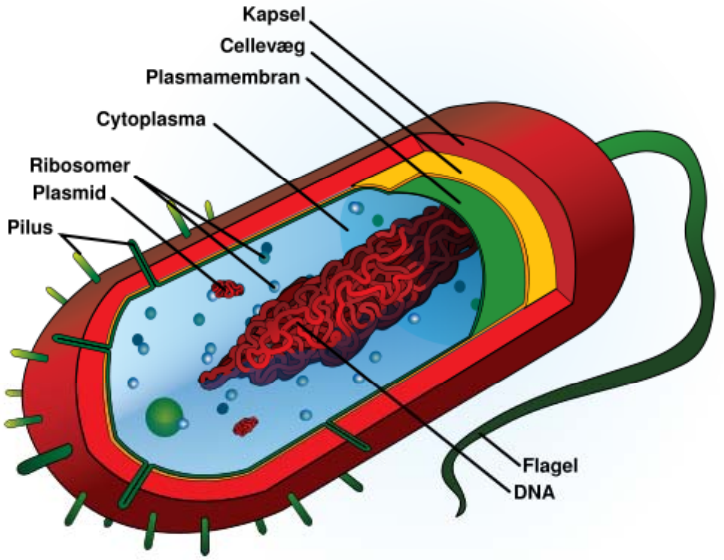
- Atoms
- Cells
- Tissues
- Organs
- Organ System
- Organism

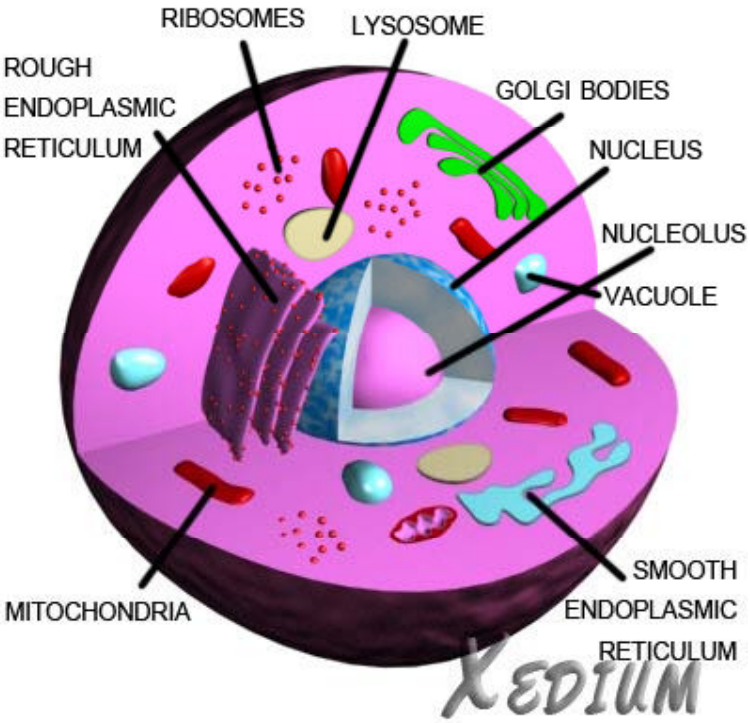


Cells

Prokaryotes- no nucleus or organelles

Example: Bacteria





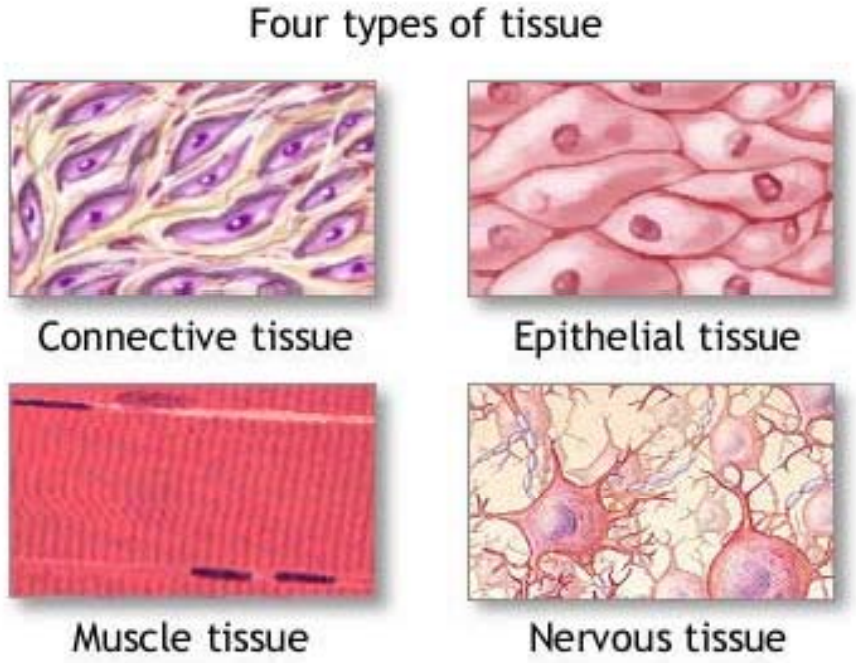
Eukaryotes- have nucleus & organelles

Example: all other living organisms!

Body Tissues

The human body has 4 main types of tissues:

1. Muscle Tissue
2. Nervous Tissue
3. Epithelial Tissue
4. Connective Tissue



MUSCLE TISSUE

- **Composed of cells that can contract.**

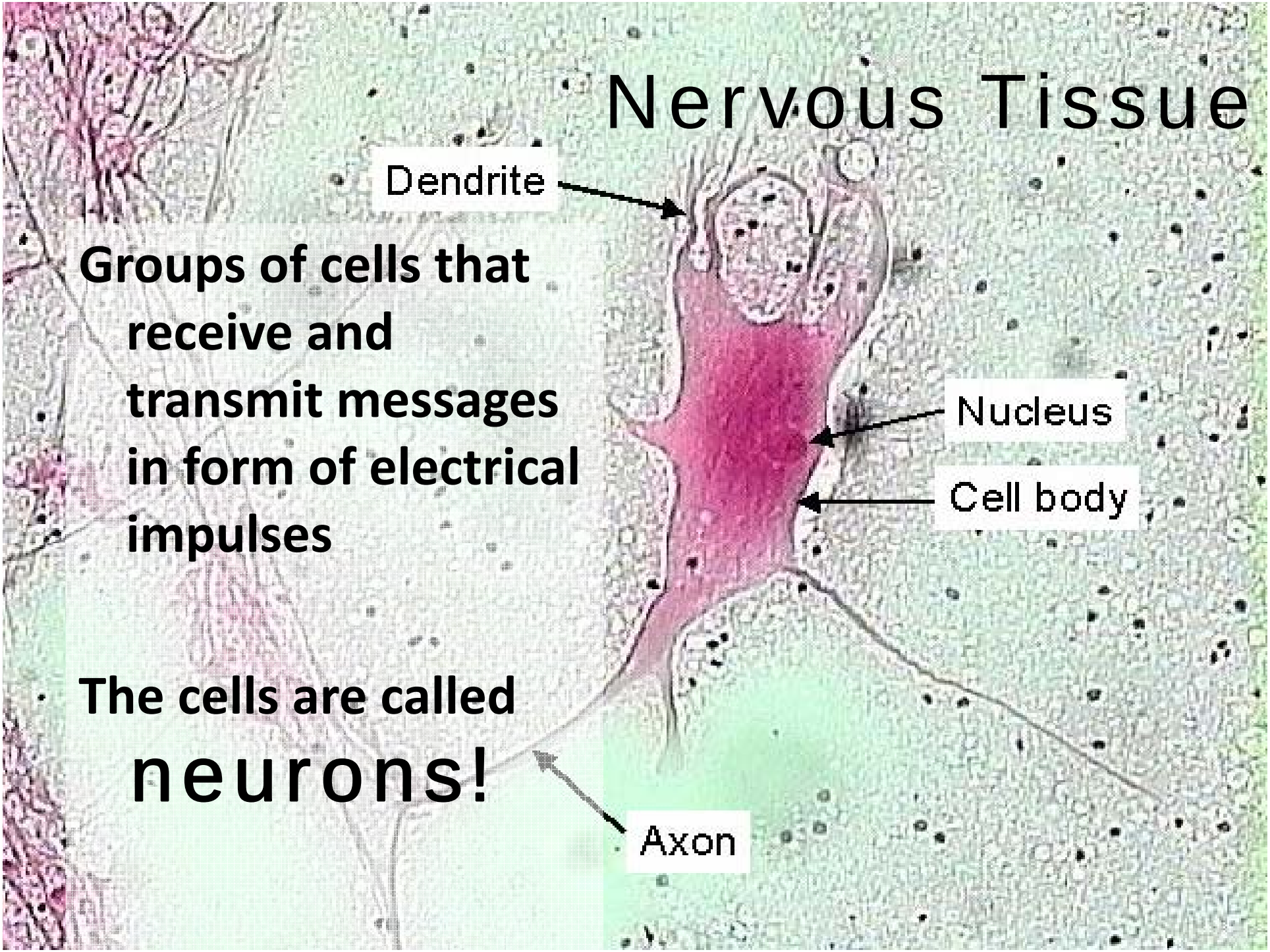
Three types:

1. Skeletal – moves the bones in your trunk, limbs, and face.

- **2. Smooth- handles body functions that you cannot control consciously (food in digestive track)**

intercalated disk

- **3. Cardiac – in your heart. Pumps blood through your body**


Nervous Tissue
Dendrite
Groups of cells that receive and transmit messages in form of electrical impulses
Nucleus
Cell body
The cells are called neurons!
Axon

Epithelial Tissue

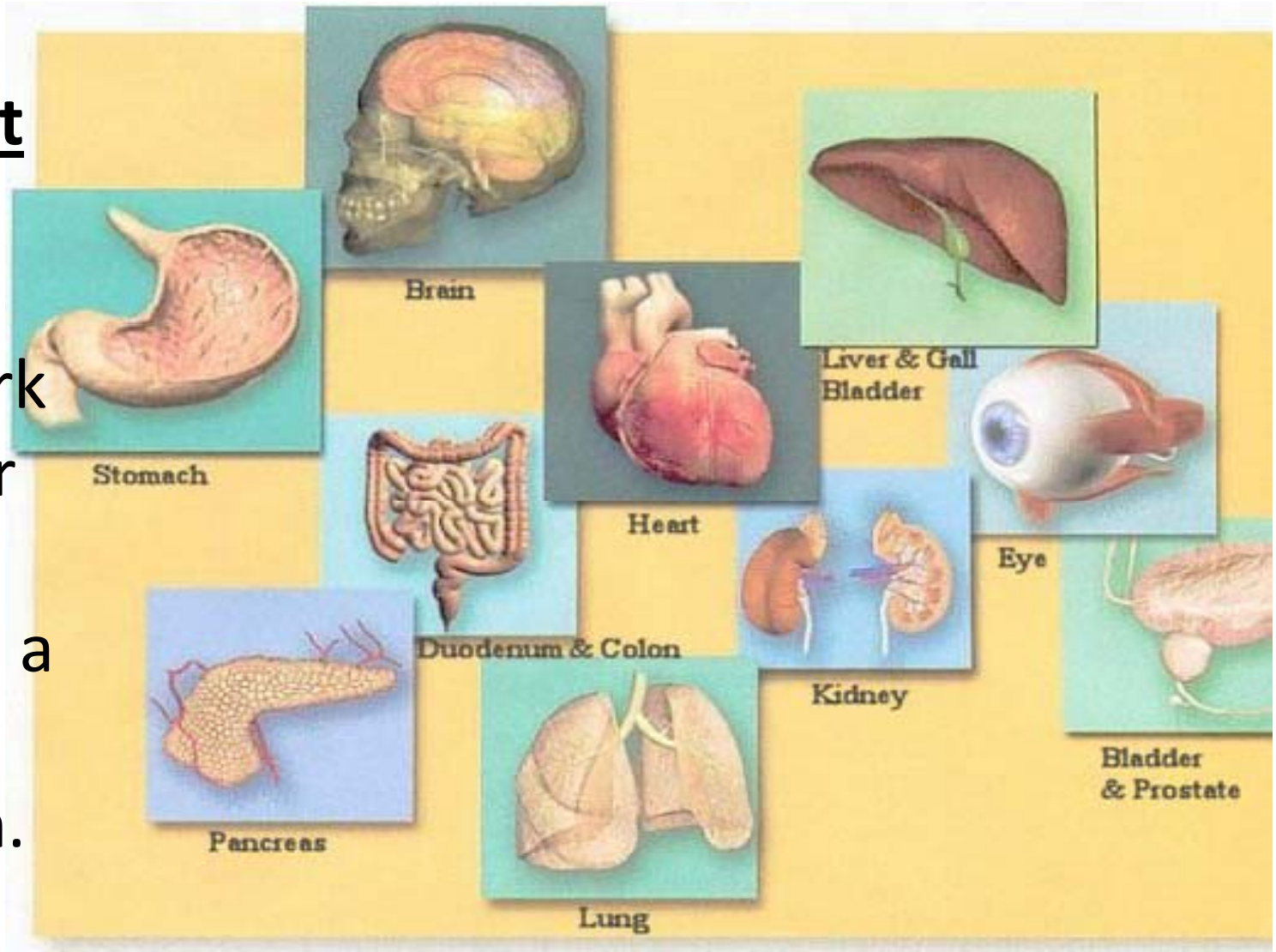
- Consists of layers of cells that line or cover all internal and external body surfaces.
- Protective barrier
- skin

Connective Tissue

- Binds, supports, and protects structures in the body
- Most abundant and diverse
- Includes bones, cartilage, tendons, fat, blood, and lymph.

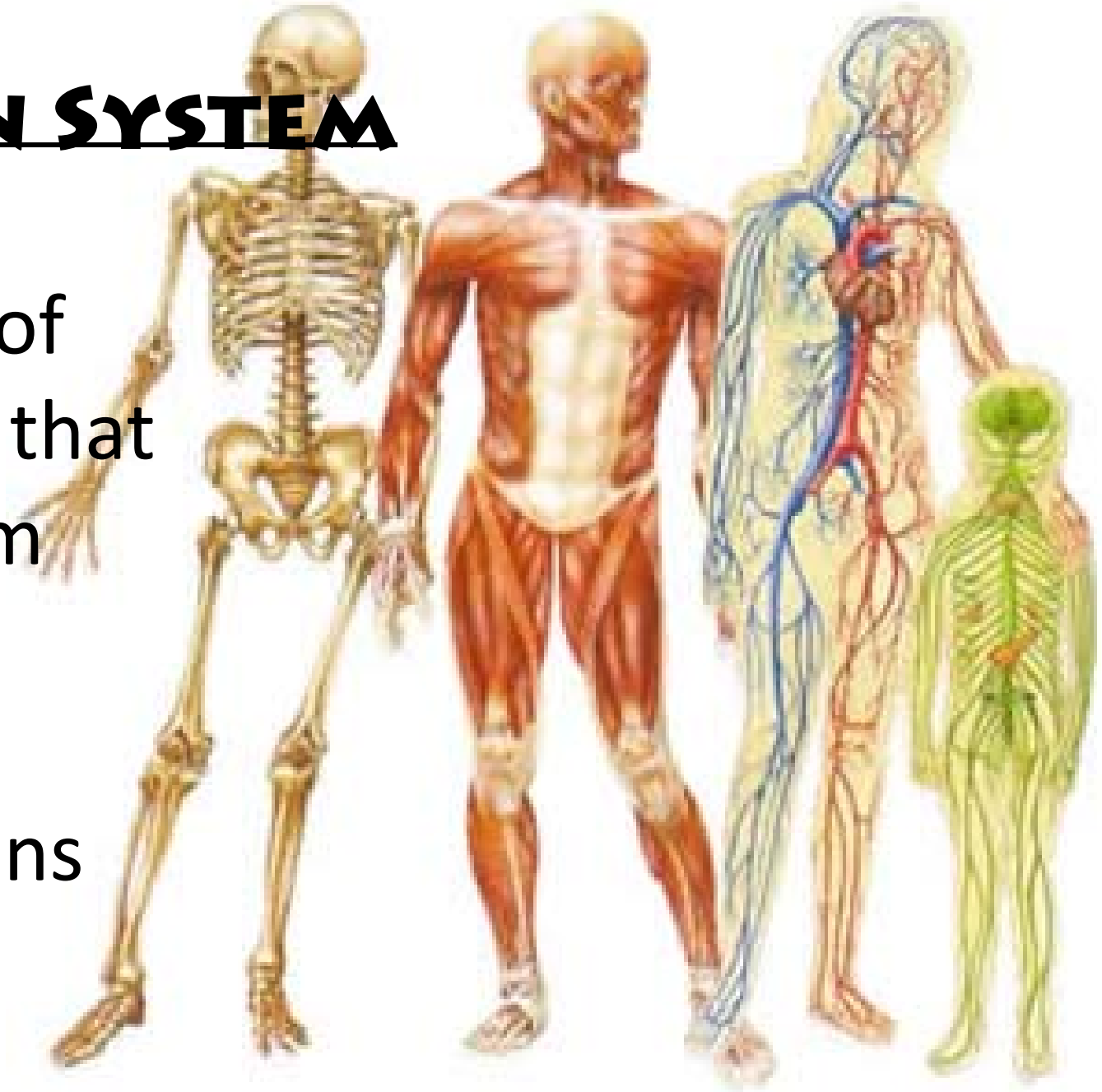
Organs

- A group of **different** types of tissues that work together to perform a single function.



Organ System

A group of organs that perform closely related functions

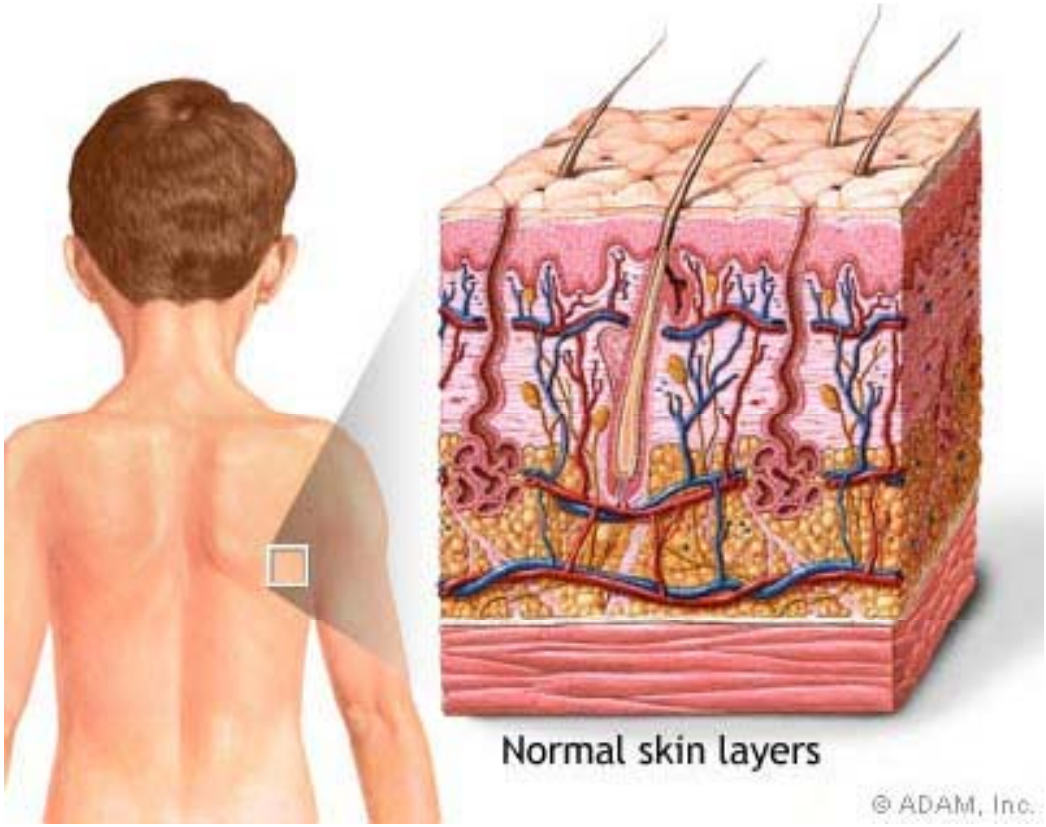


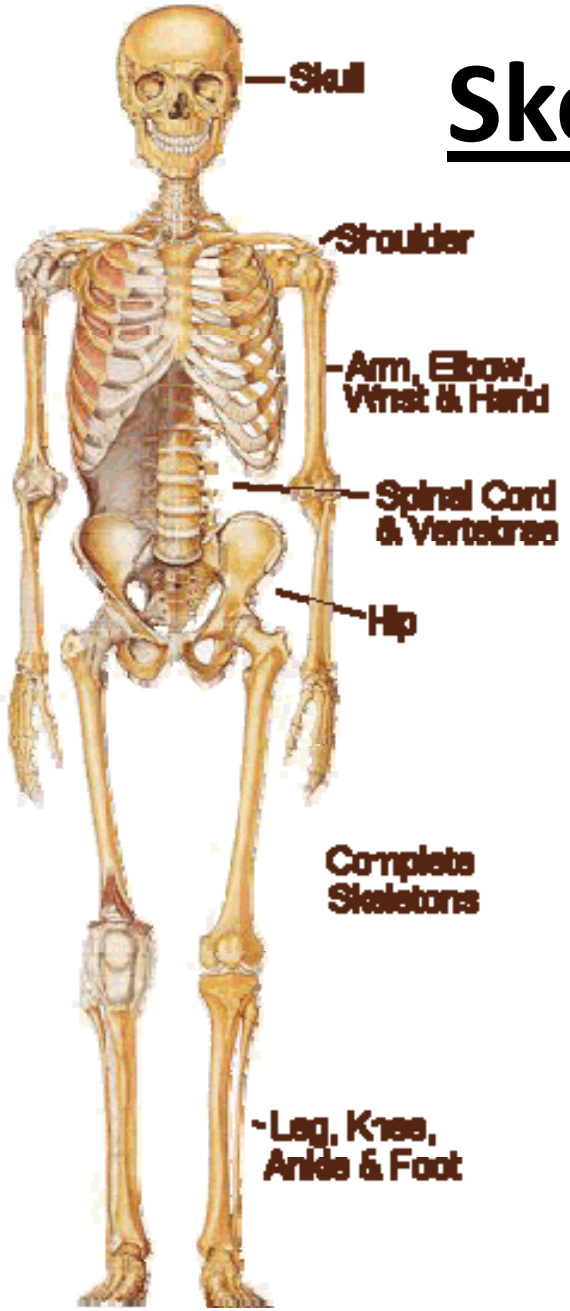
There are 11 organ systems in the human body:

1. Integumentary System
2. Skeletal System
3. Muscular System
4. Nervous System
5. Endocrine System
6. Cardiovascular System
7. Lymphatic & Immune System
8. Respiratory System
9. Digestive System
10. Urinary System
11. Reproductive System

Integumentary System

- The skin & derived structures (hair, nails, & glands).
- It protects internal organs & helps maintain body temperature.



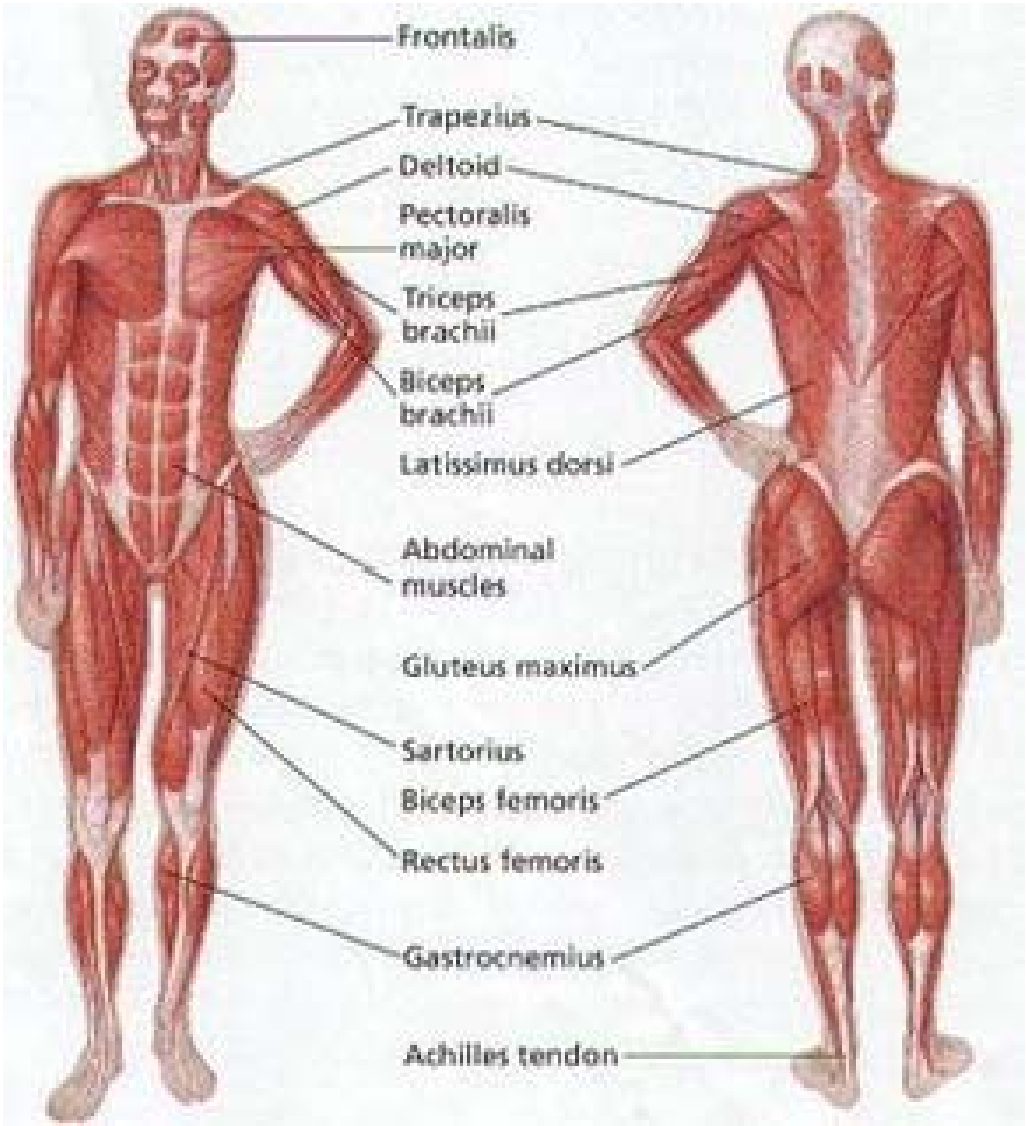


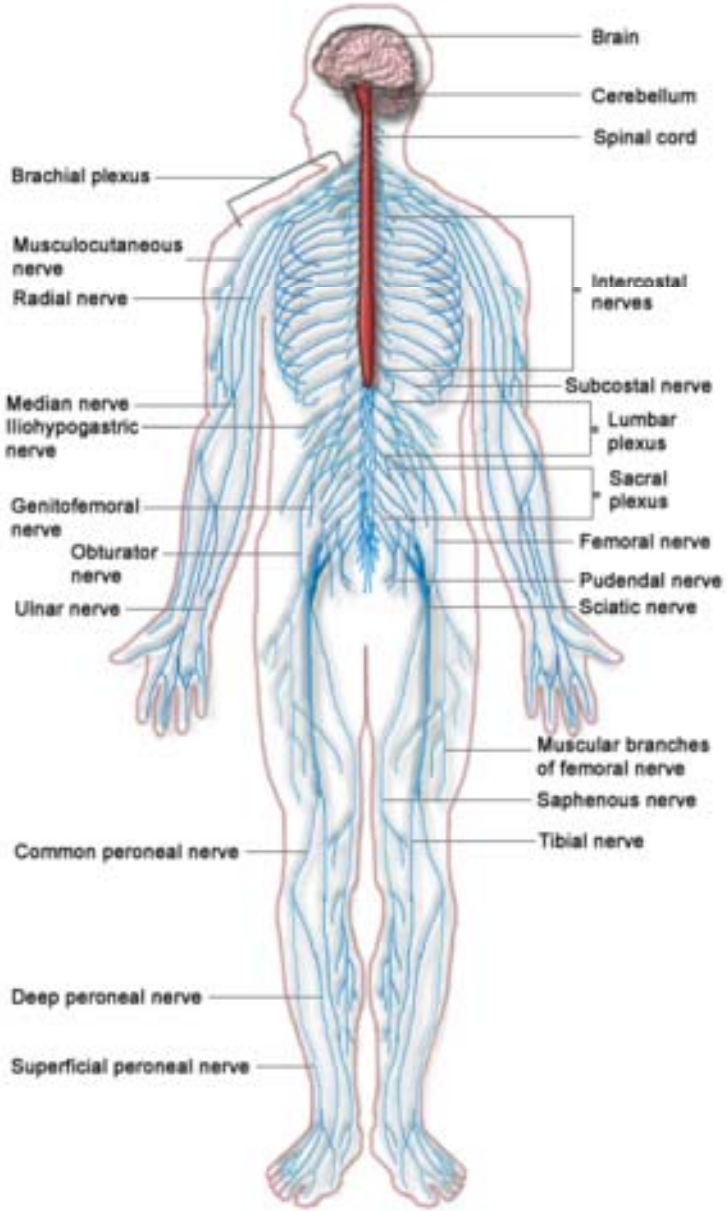
Skeletal System

- The bones & joints
- It provides support and protection to internal organs.

Muscular System

- Skeletal Muscle
- It provides movement



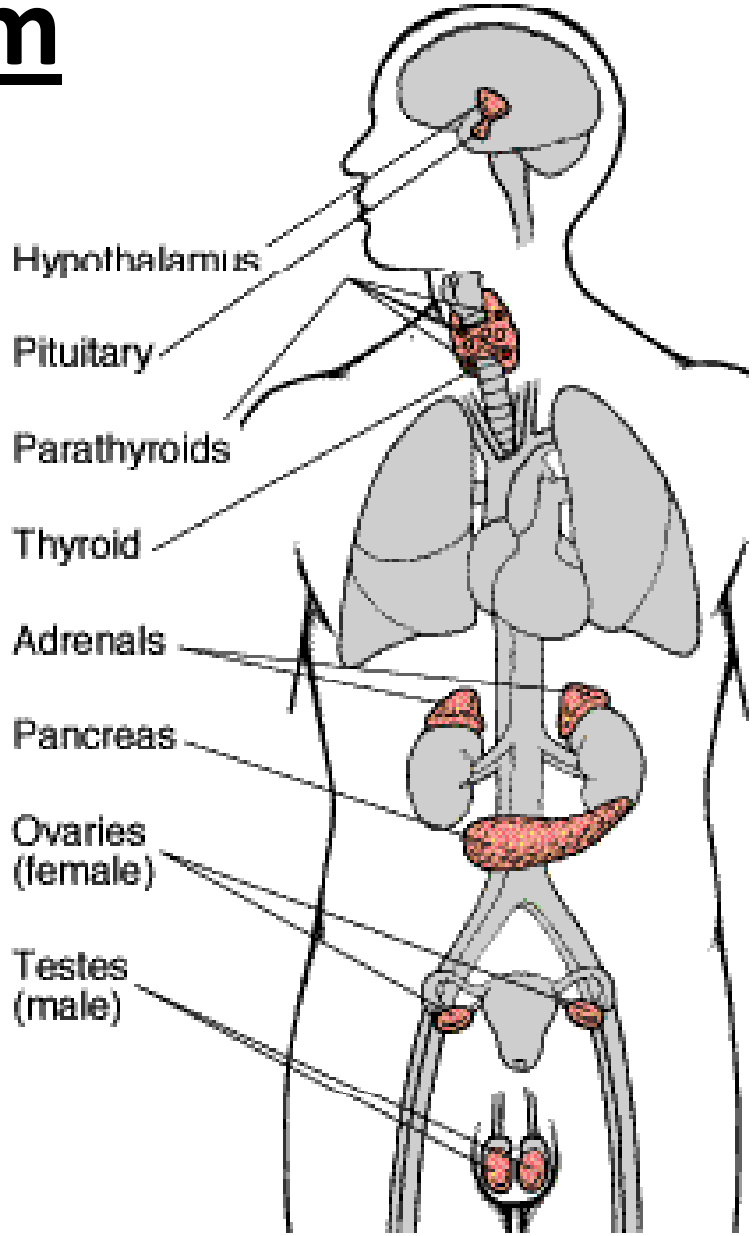


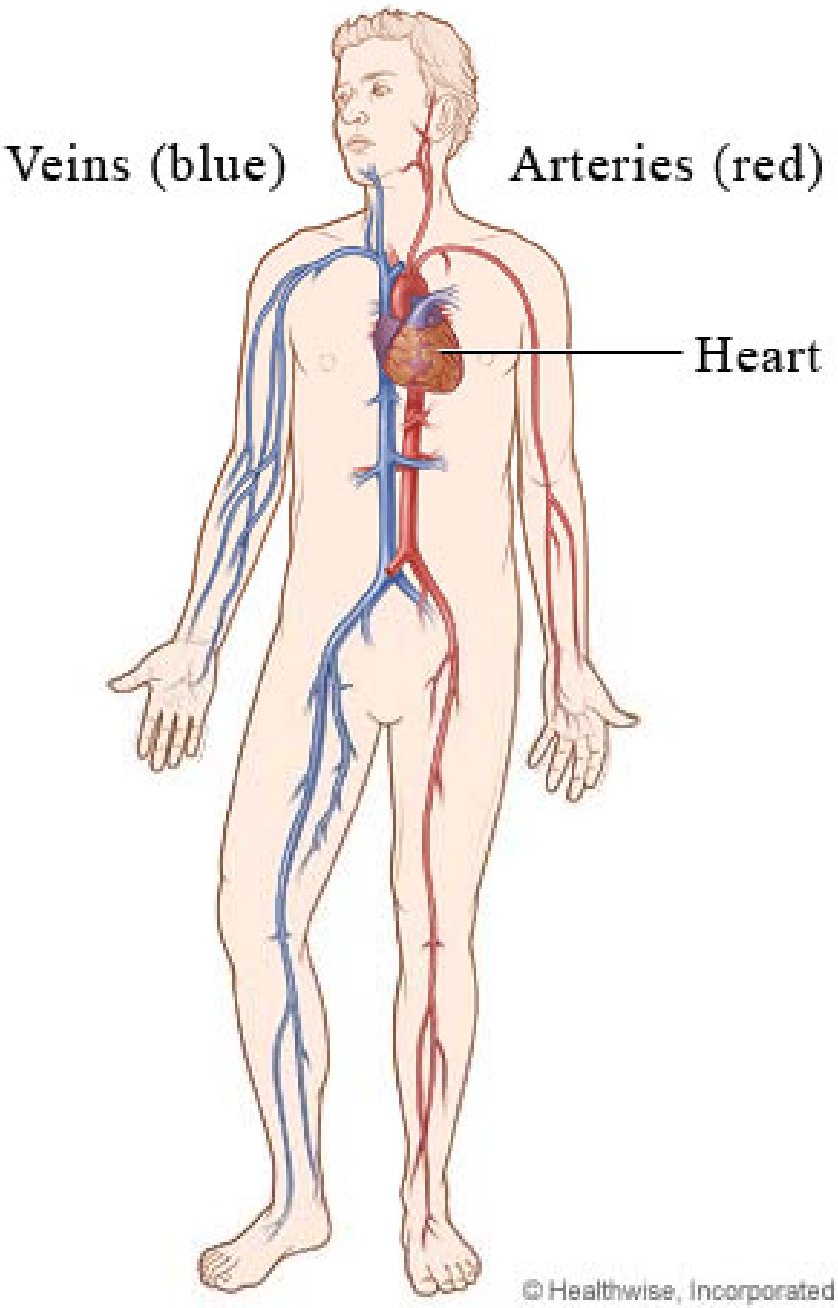
Nervous System

- Brain, Spinal Cord, & Nerves
- It controls and coordinates functions throughout the body
- It responds to internal and external stimuli
- It transmits impulses (messages)

Endocrine System

- Hormone-producing cells & glands
- Glands release hormones that act as messengers in the body.
- Helps with homeostasis

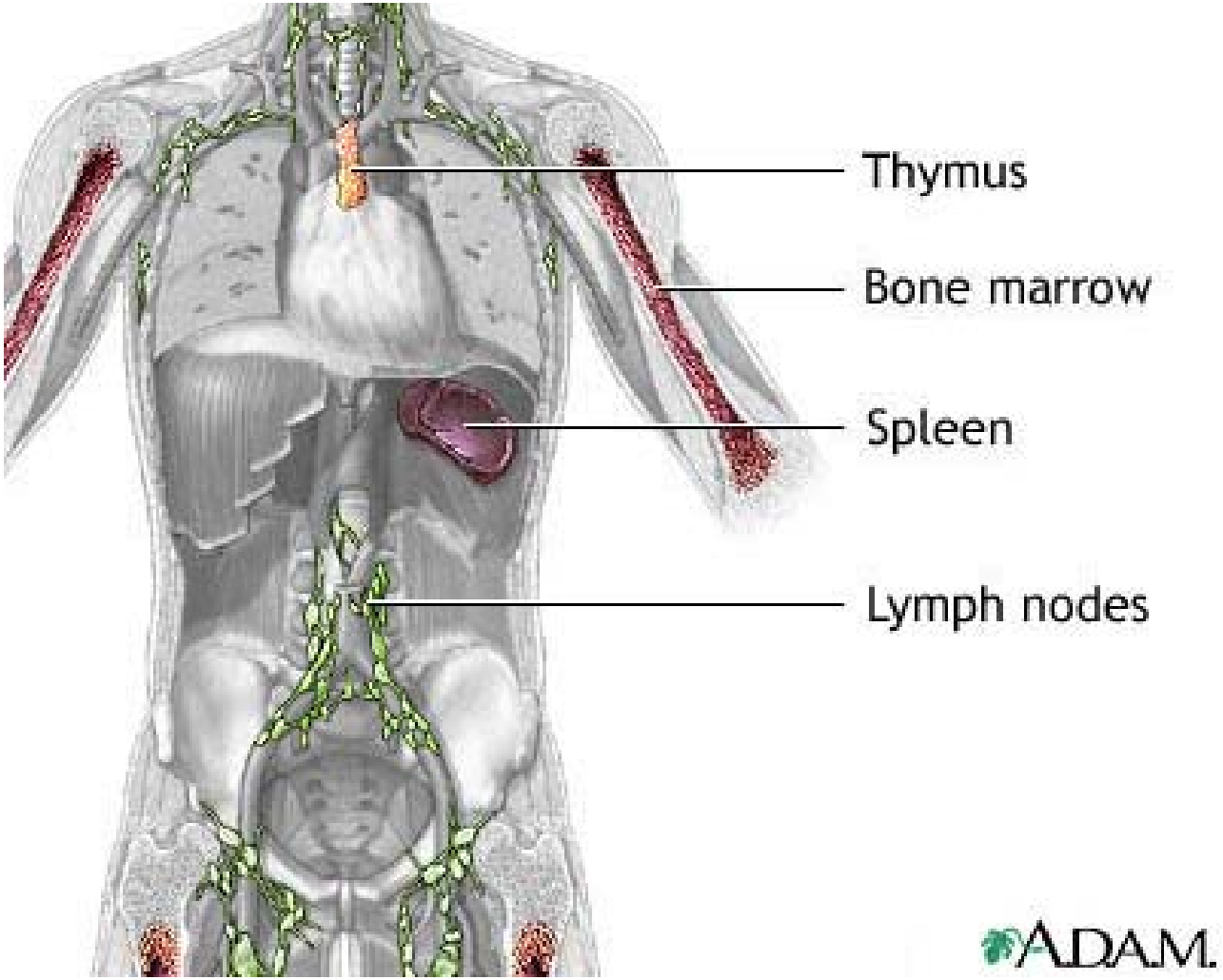




Cardiovascular System

- Blood, heart, & blood vessels
- It transports oxygen, nutrients, and waste throughout the body

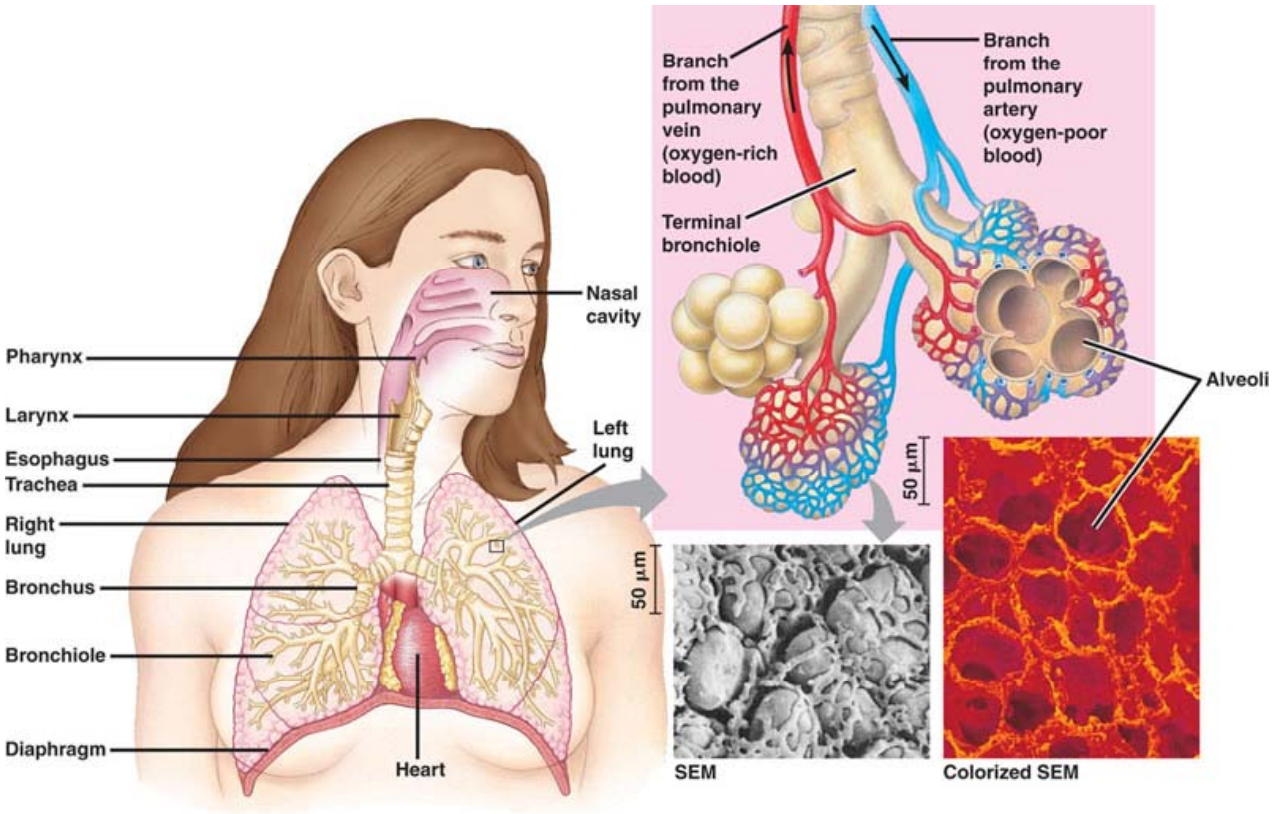
Immune System



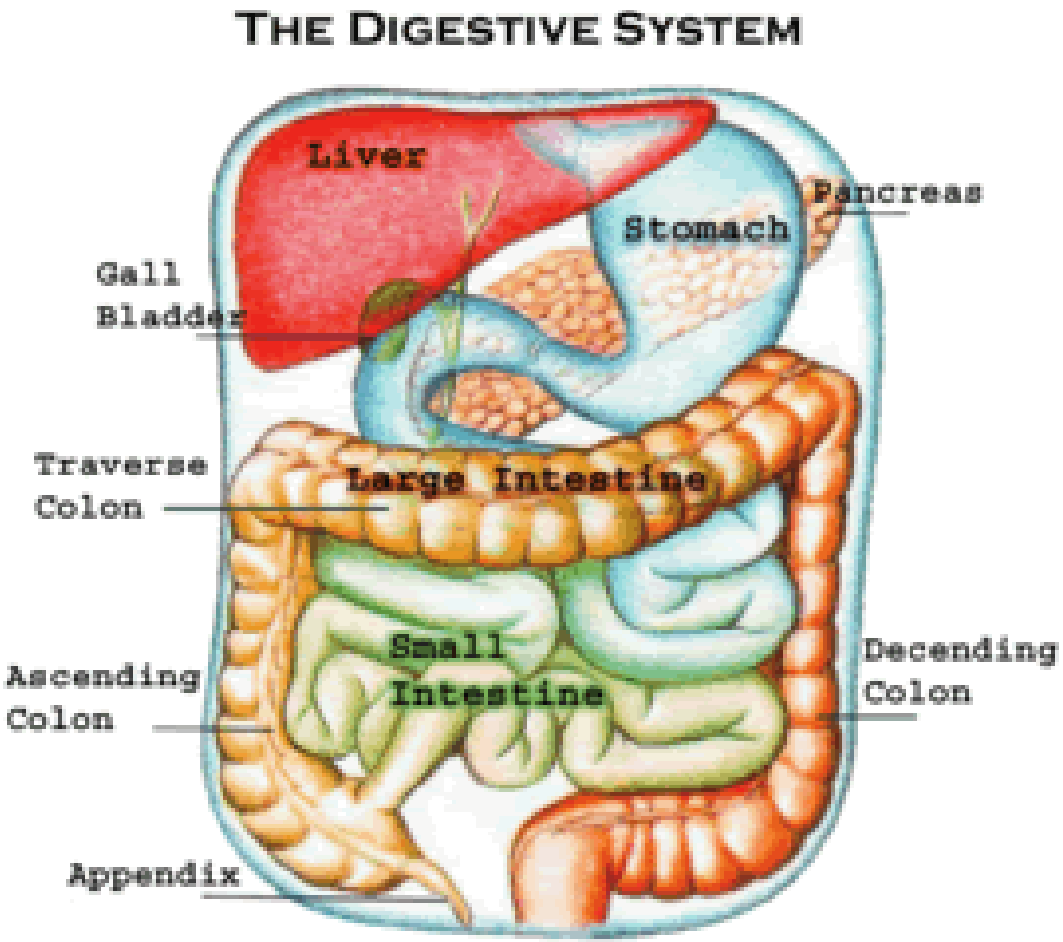
- Lymphatic vessels, fluid, & Blood
- It filters out disease causing problems

Respiratory System

- Lungs & airways
- It exchanges oxygen & carbon dioxide between the blood, air, & tissues (cells).



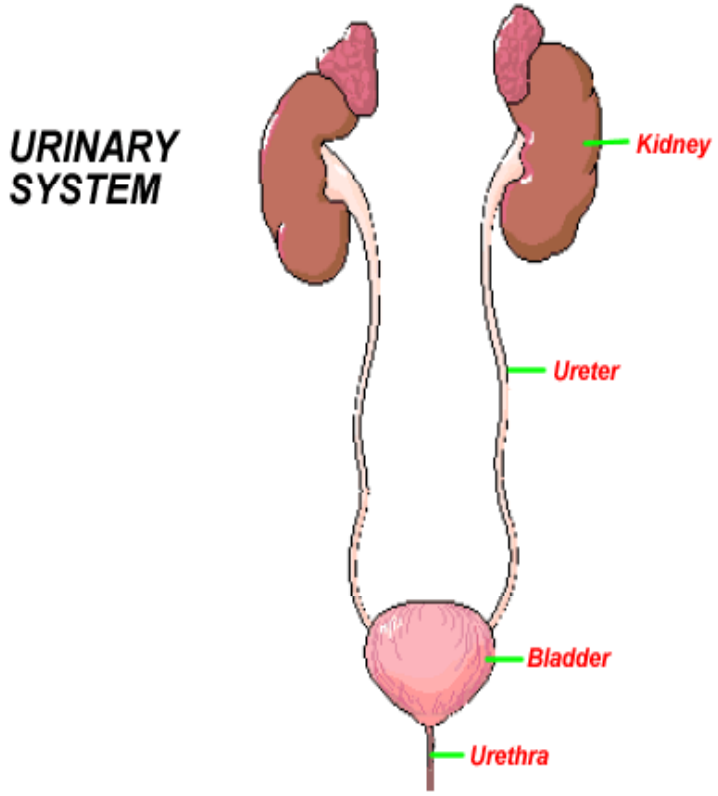
Digestive System



- Organs of the gastrointestinal tract
- It helps convert food into simpler molecules that can be absorbed and used by the cells of the body

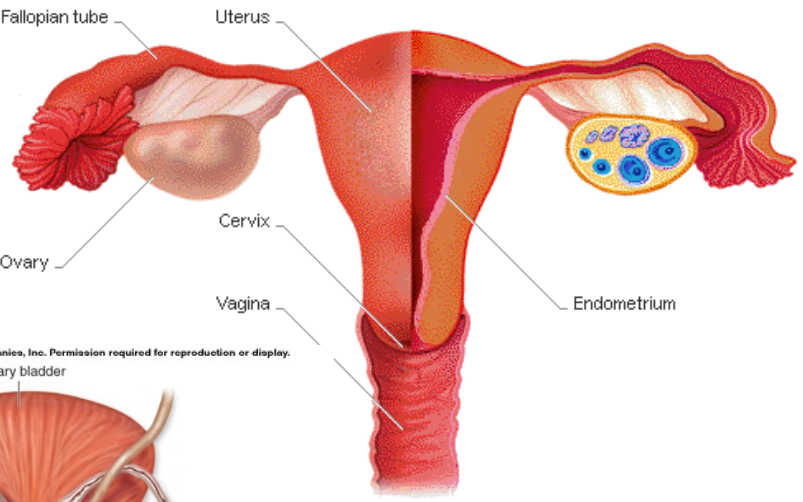
Urinary System

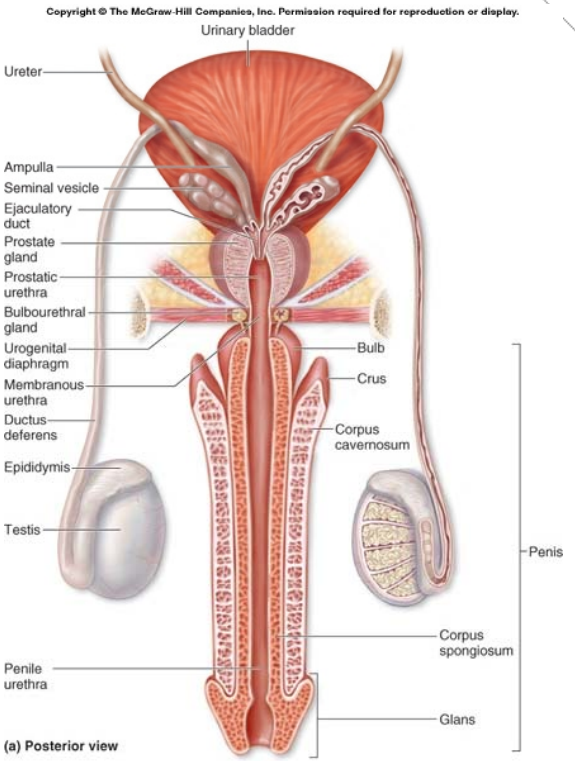
- Kidneys, bladder, & ureters
- It maintains homeostasis by removing waste products from the blood
- It maintains blood pH and water content



Reproductive System

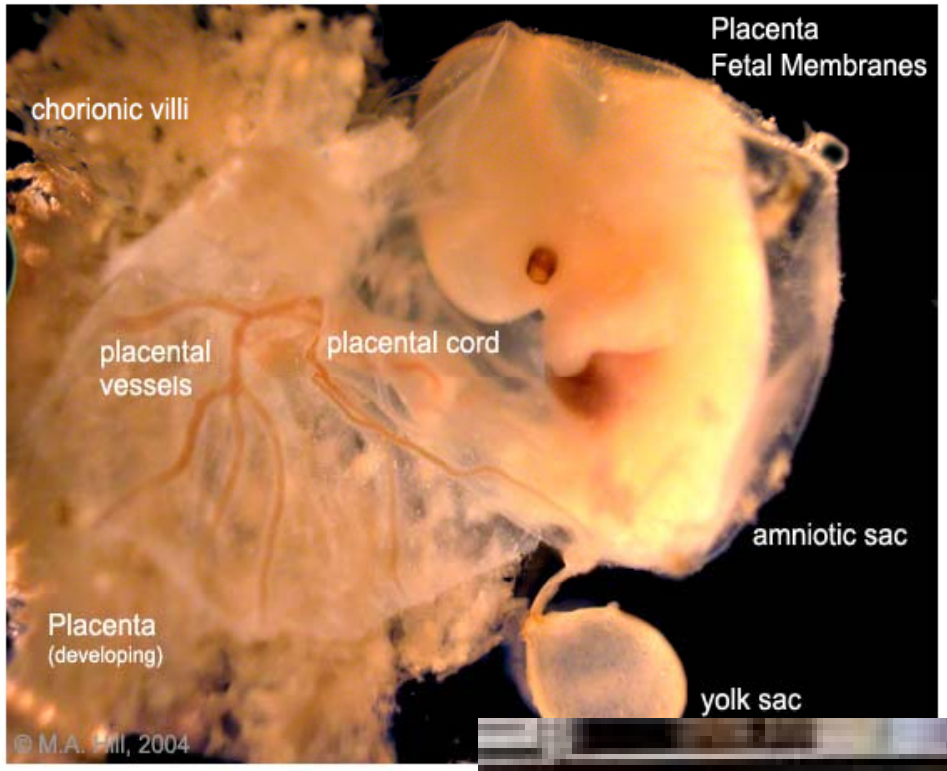
- Male & Female reproductive organs
- It is responsible for the continuity of life
- It produces the gametes (sperm & egg)





The Organism

An organism is the highest level of organization.



Any questions?