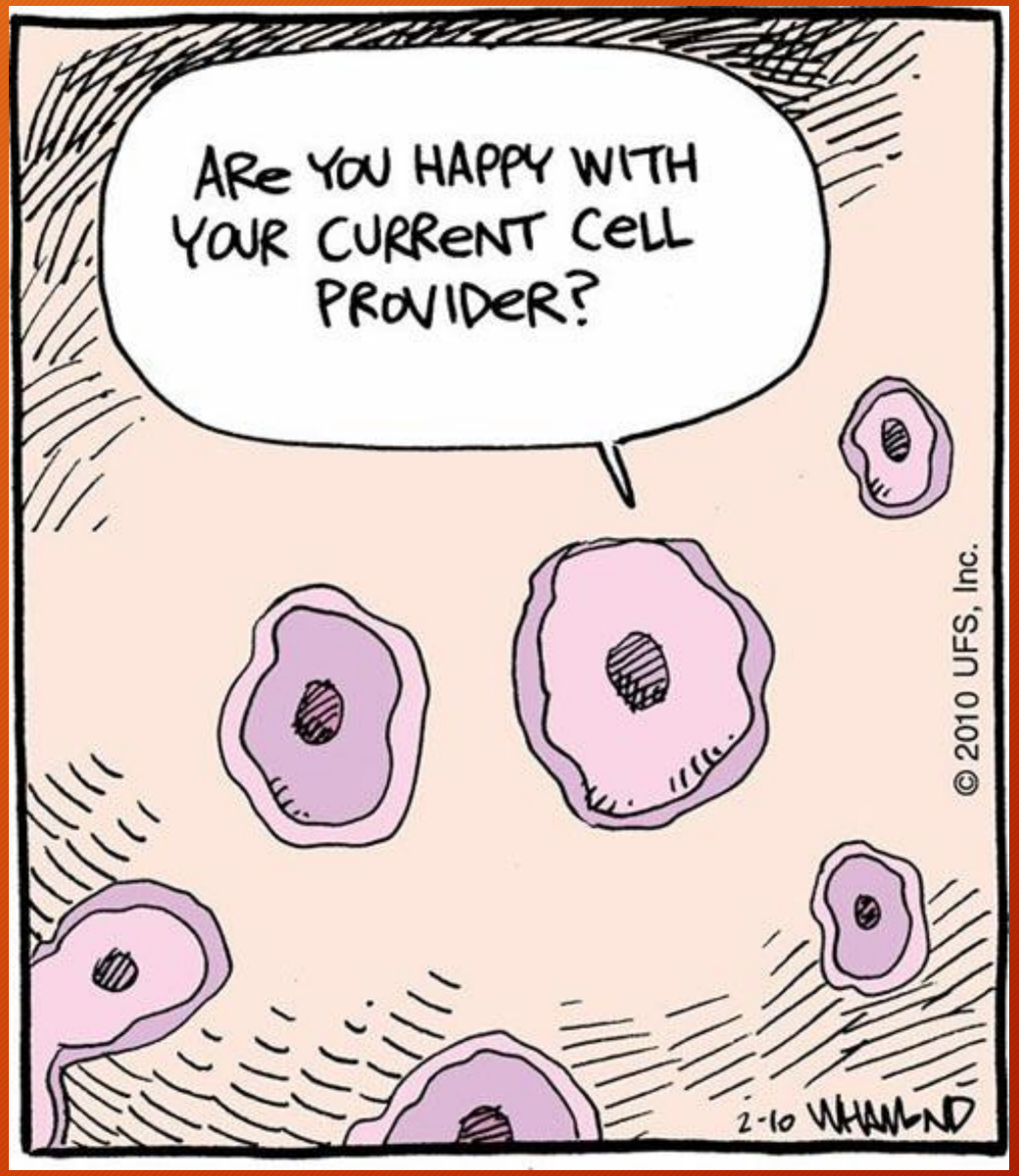
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Cellular Specialization

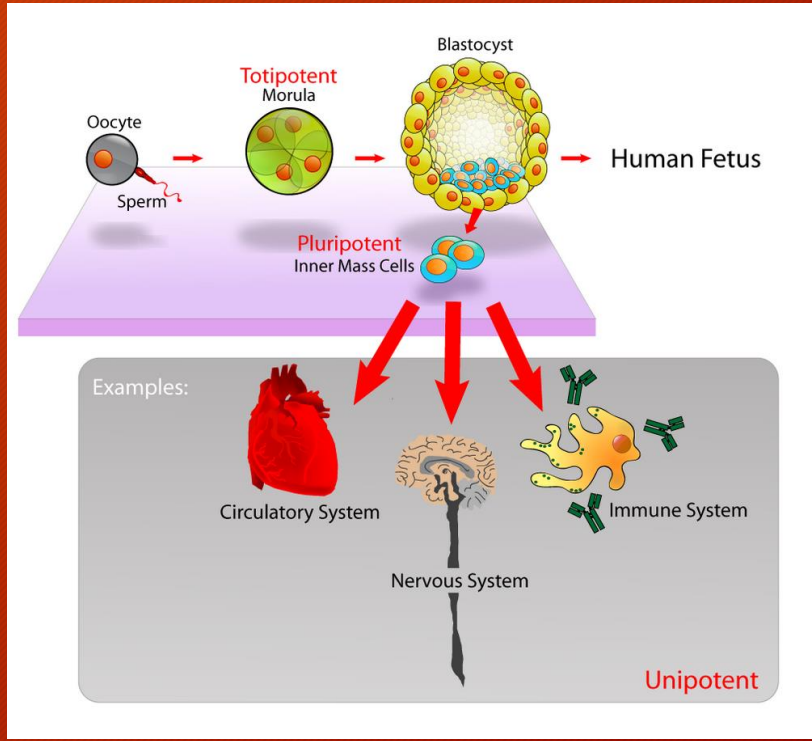
Cell Specialization

- Following fertilization we have the formation of the ZYGOTE.
- Zygote: a single cell with a full set of DNA
- This cell begins to divide and eventually we have PLURIPOTENT cells- Cells that can become any other cell in the body

Cellular Specialization

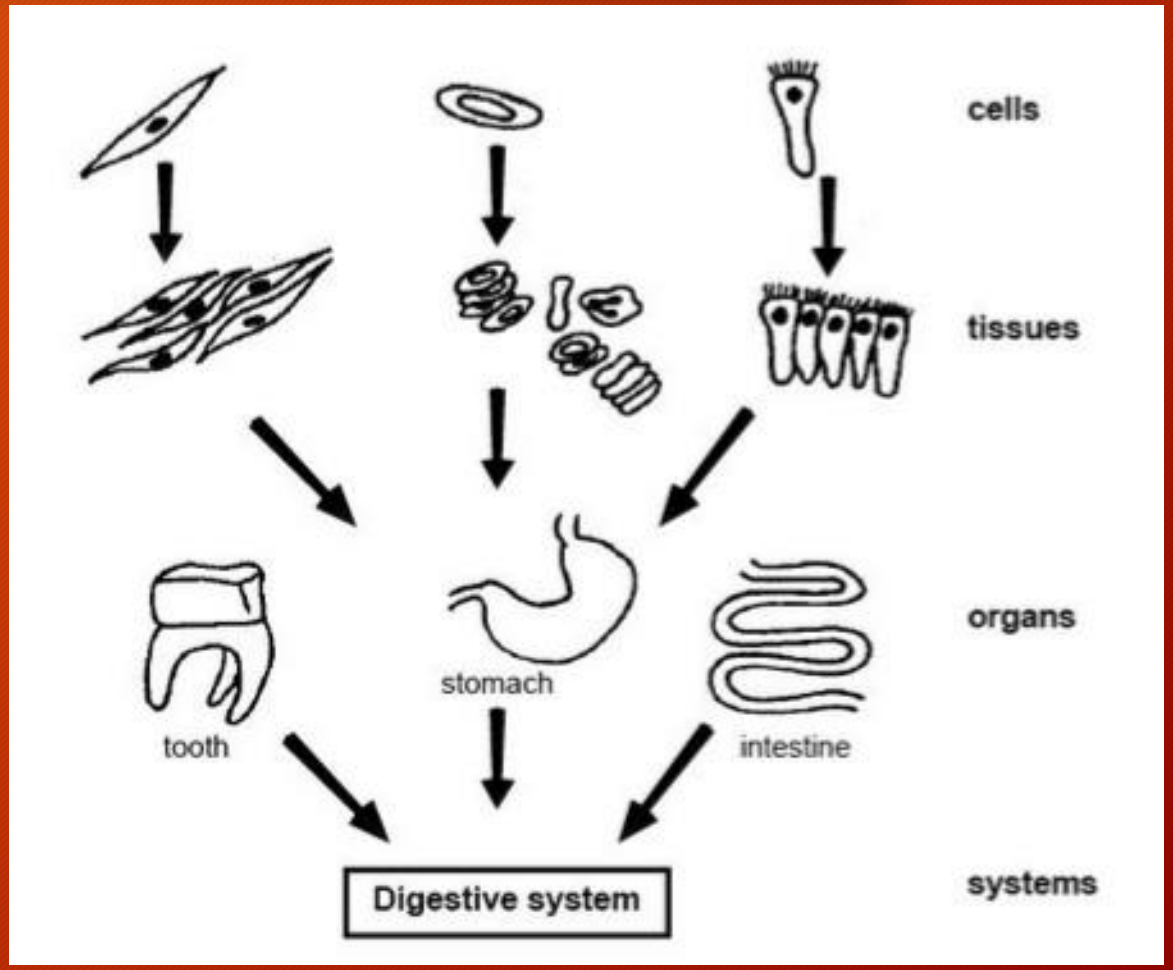
- This cell begins to divide and eventually we have PLURIPOTENT stem cells

-Cells that can become any other cell in the body

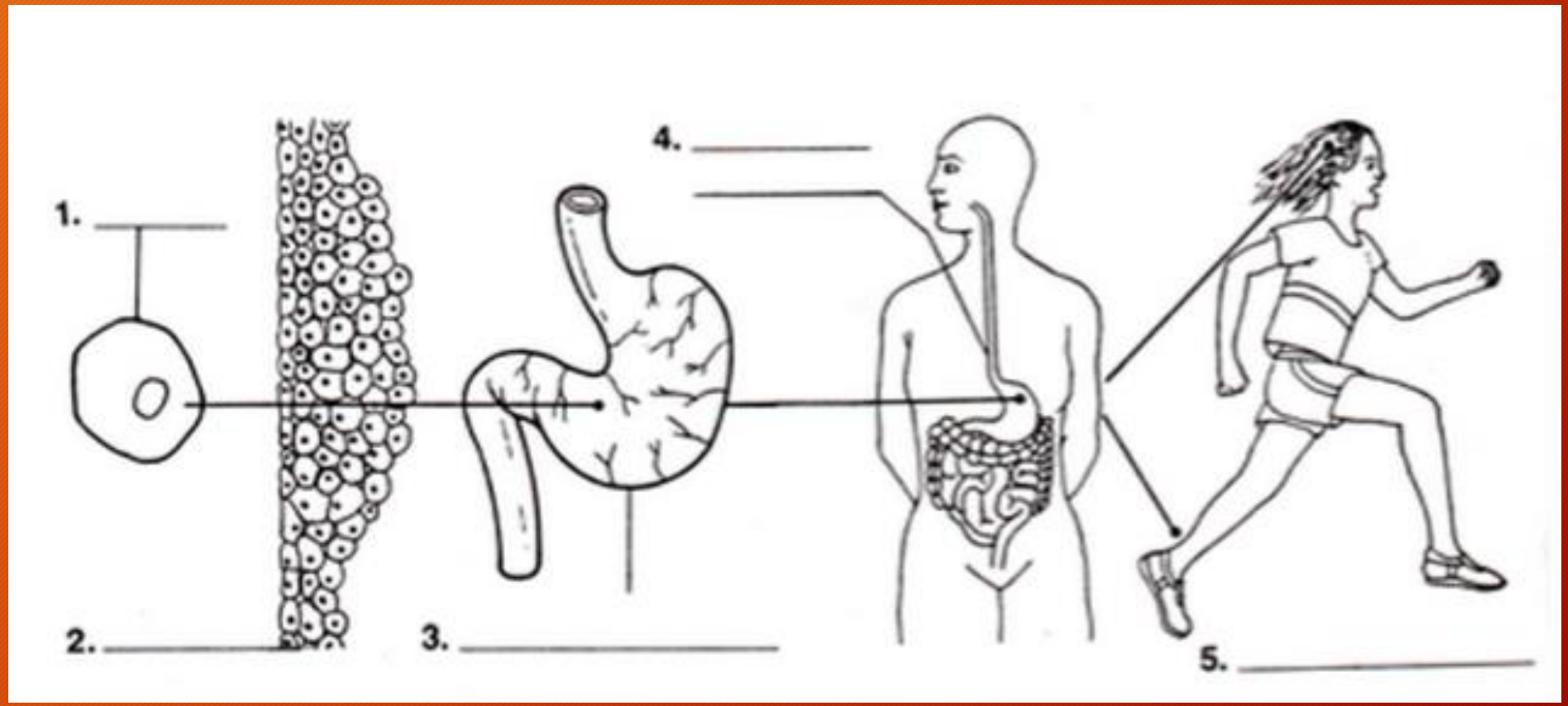


Cellular Specialization

- Cells do not only multiply (or divide).
- Cells also have specialized functions.

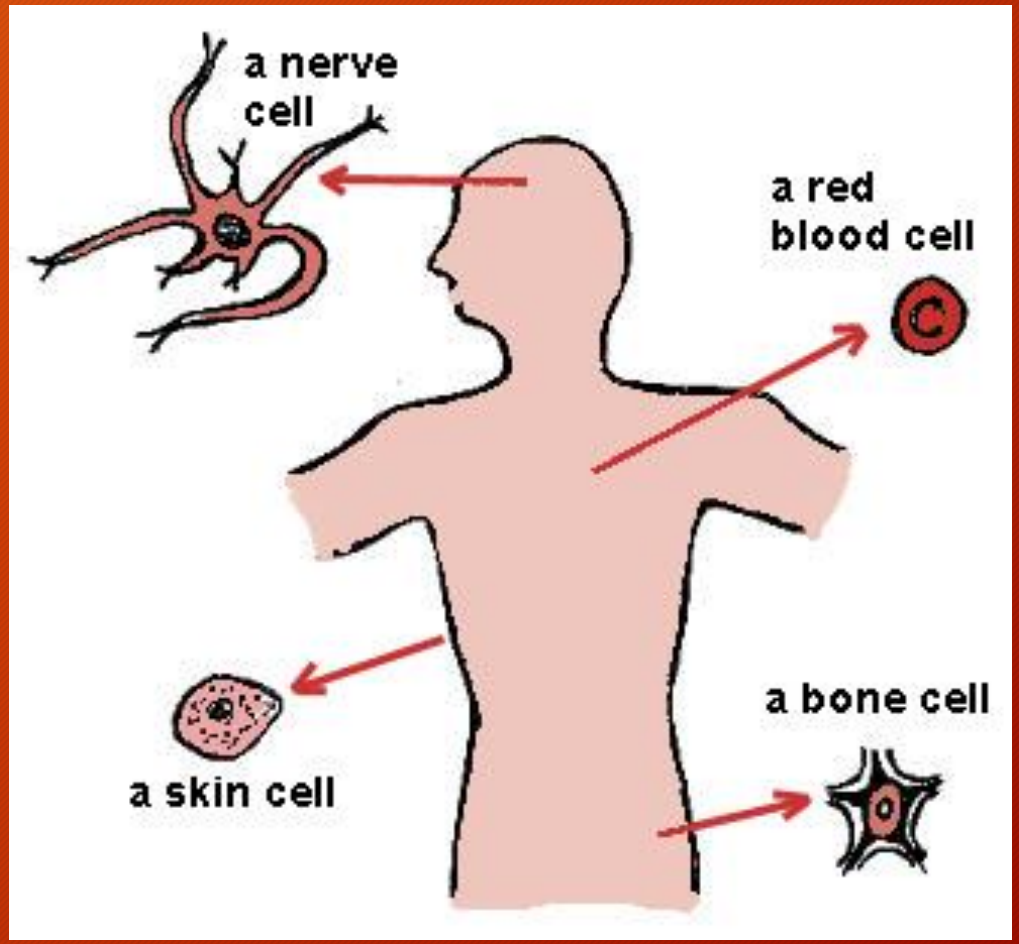


Cellular Specialization



Cellular Specialization

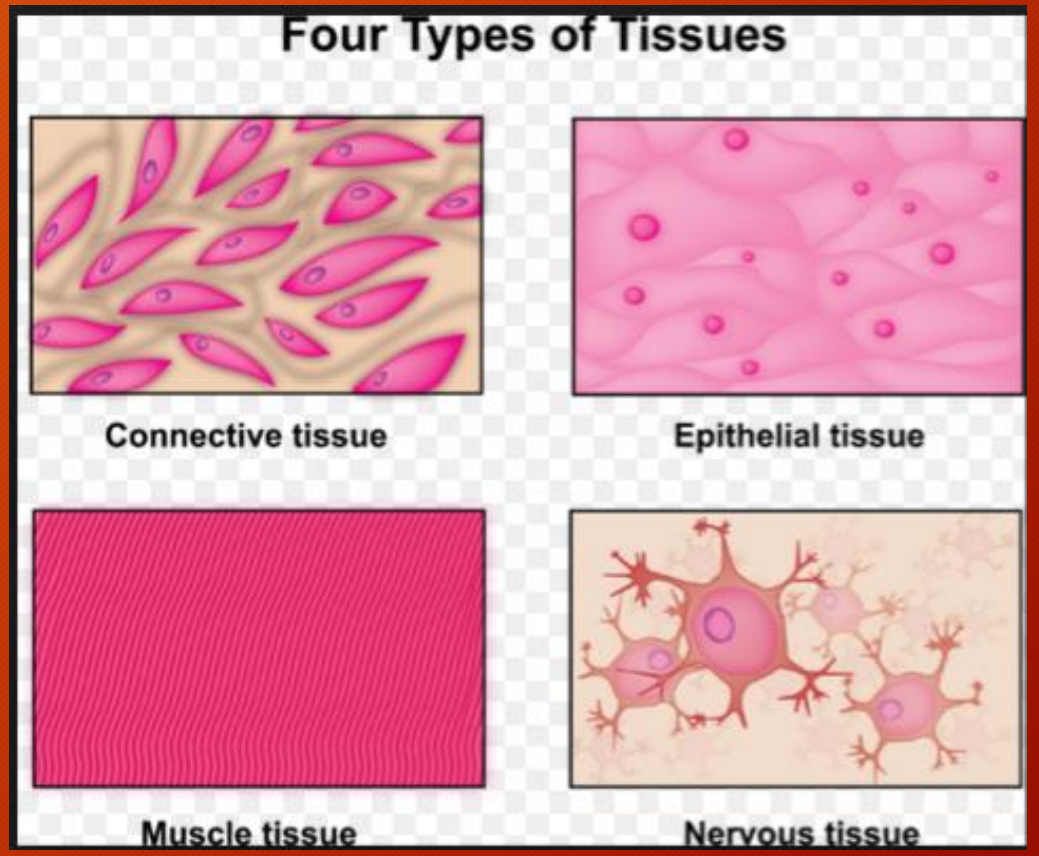
- Cells can have specialized functions.
- Examples:



Cellular Specialization

- A group of cells that have a common structure and function are called tissues.

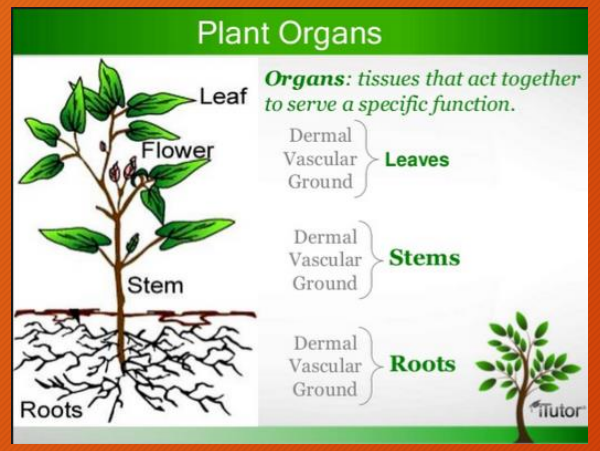
- Tissue examples are:
- Epithelial tissue of skin
- Fatty tissue that stores nutrients as fats
- Cardiac muscle tissue

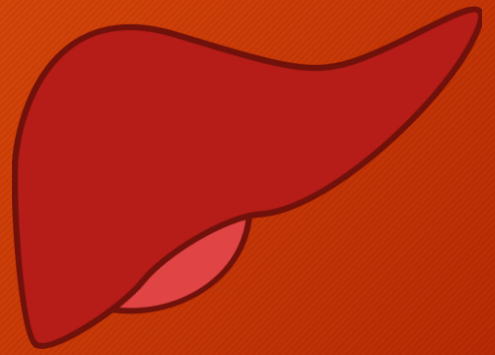


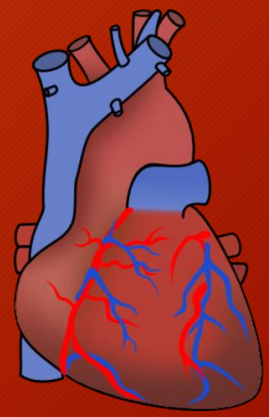
Cellular Specialization

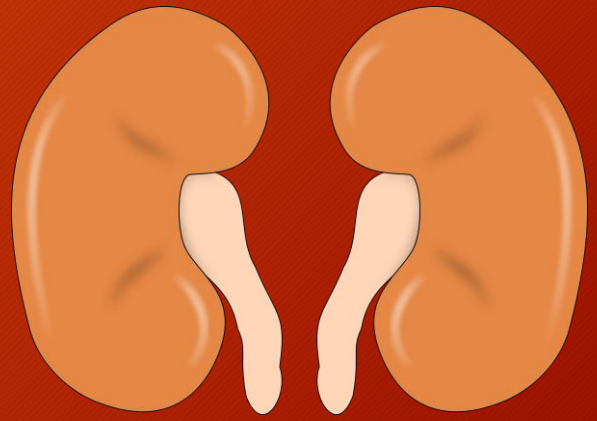
- Two or more tissue tyes that perform a specific function is an organ.

- Organ examples:





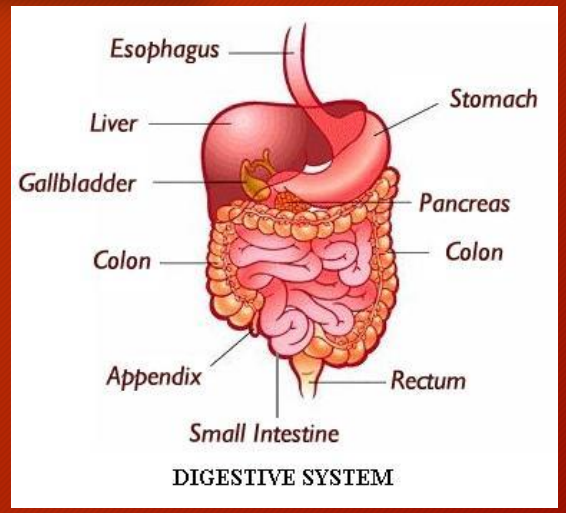


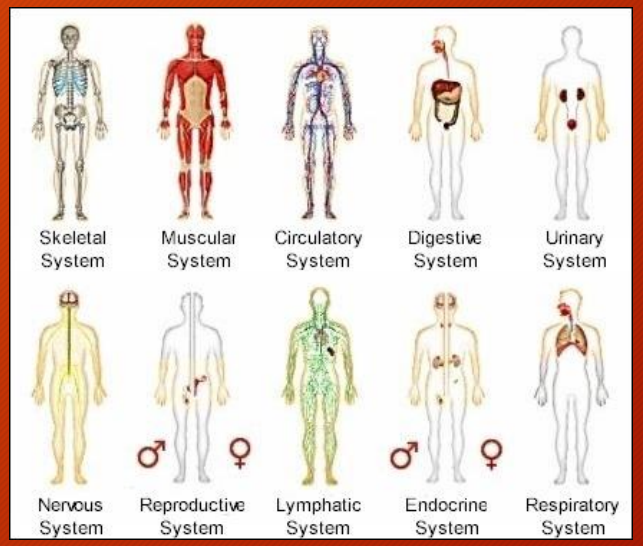


Cellular Specialization

- A group of organs (and tissues) working together to accomplish a common function is a system.

- System examples:





Cellular Specialization

Table 40.1 Organ Systems: Their Main Components and Functions in Mammals

Organ System	Main Components	Main Functions
Digestive	Mouth, pharynx, esophagus, stomach, intestines, liver, pancreas, anus	Food processing (ingestion, digestion, absorption, elimination)
Circulatory	Heart, blood vessels, blood	Internal distribution of materials
Respiratory	Lungs, trachea, other breathing tubes	Gas exchange (uptake of oxygen; disposal of carbon dioxide)
Immune and lymphatic	Bone marrow, lymph nodes, thymus, spleen, lymph vessels, white blood cells	Body defense (fighting infections and cancer)
Excretory	Kidneys, ureters, urinary bladder, urethra	Disposal of metabolic wastes; regulation of osmotic balance of blood
Endocrine	Pituitary, thyroid, pancreas, other hormone-secreting glands	Coordination of body activities (such as digestion, metabolism)
Reproductive	Ovaries, testes, and associated organs	Reproduction
Nervous	Brain, spinal cord, nerves, sensory organs	Coordination of body activities; detection of stimuli and formulation of responses to them
Integumentary	Skin and its derivatives (such as hair, claws, skin glands)	Protection against mechanical injury, infection, drying out; thermoregulation
Skeletal	Skeleton (bones, tendons, ligaments, cartilage)	Body support, protection of internal organs, movement
Muscular	Skeletal muscles	Movement, locomotion

Cellular Specialization

- All organ systems together make up an organism or a living body.