

HOW ARE THESE ORGANISMS ALIKE? HOW ARE THEY DIFFERENT?

3.1



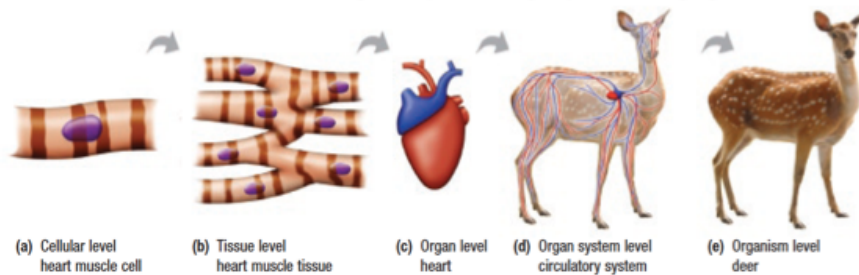
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THE HIERARCHY OF STRUCTURE IN ANIMALS

3.1

A **hierarchy** is an organizational structure where the most important things are at the top and the least complex are at the bottom.

The organizational hierarchy in animals is: **cell** → **tissue** → **organ** → **organ system** → **organism**



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ANOTHER EXAMPLE: HUMANS

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THE HIERARCHY OF STRUCTURE IN ANIMALS

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Vocabulary

- organ system
- organ
- tissue
- epithelial tissue
- connective tissue
- muscle tissue
- nerve tissue

Organism is a living thing. They are a component of the biotic (living) environment.

Organ systems contain one or more organs and other structures working together to perform a vital life function. Examples of organ systems include the digestive, reproduction, and respiratory systems.

An **organ** is made up of two or more types of tissue that work together to perform a complex life function. Examples of organs include the heart, lungs, and stomach.

A **tissue** is a collection of similar cells that perform a particular, but limited, function. Examples include epithelial tissue, connective tissue, muscle tissue, and nerve tissue. Each of these types of tissue contains many types of specialized cells, and each is found in most organ systems.

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Organisms perform a wide variety of functions which include:

- Respiration
- Regulation/Control
- Reproduction
- Excretion
- Growth
- Nutrition
- Transport

Vocabulary

- organ system
- organ
- tissue
- epithelial tissue
- connective tissue
- muscle tissue
- nerve tissue

Organ systems:

- | | |
|---------------|--------------|
| Muscular | Skeletal |
| Integumentary | Reproductive |
| Nervous | Respiratory |
| Digestive | Lymphatic |
| Circulatory | Endocrine |
| Urinary | |

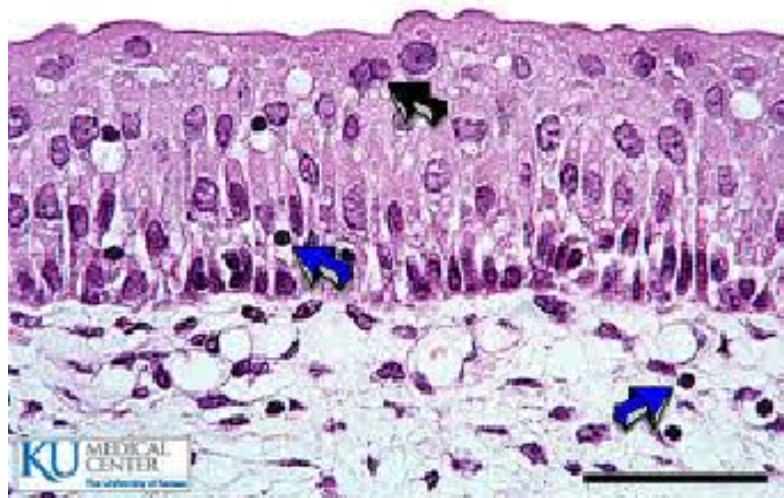


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Epithelial Tissue

Thin sheets of tightly packed cells covering surfaces and lining organs.

Provides protection from dehydration and low-friction surfaces.



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Muscle Tissue

Bundles of long cells called muscle fibres that contain specialized proteins capable of shortening or contracting.

Used for movement of bones, food in digestive tract and blood.

The diagram illustrates three types of muscle cells. Cardiac muscle cells are branched and striated, found in the heart. Skeletal muscle cells are long, cylindrical, and striated, found in the arms and legs. Smooth muscle cells are spindle-shaped and non-striated, found in the stomach and blood vessels. Arrows point from these cell types to their respective locations in a human torso diagram.

ADAM.

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Connective Tissue

Various types of cells and fibres used for support, insulation, strength.

Bones, tendons, blood are all examples of connective tissues.

The diagram shows a cross-section of the acromioclavicular joint. The clavicle is at the top, and the scapula is at the bottom. The acromion and coracoid process are visible. The joint capsule is shown surrounding the joint. The Coraco-acromial ligament and Coraco-clavicular ligament are labeled. The diagram is credited to © BMJG 2001.

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Nerve Tissue

Long, thin cells with fine branches at the end capable of conducting electrical impulses.

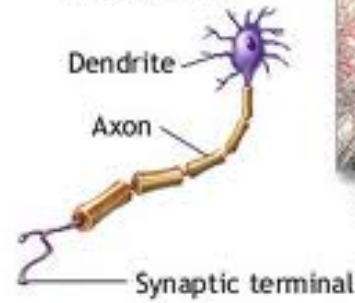
Responsible for coordination of body actions and communication within the body.



Aging brain

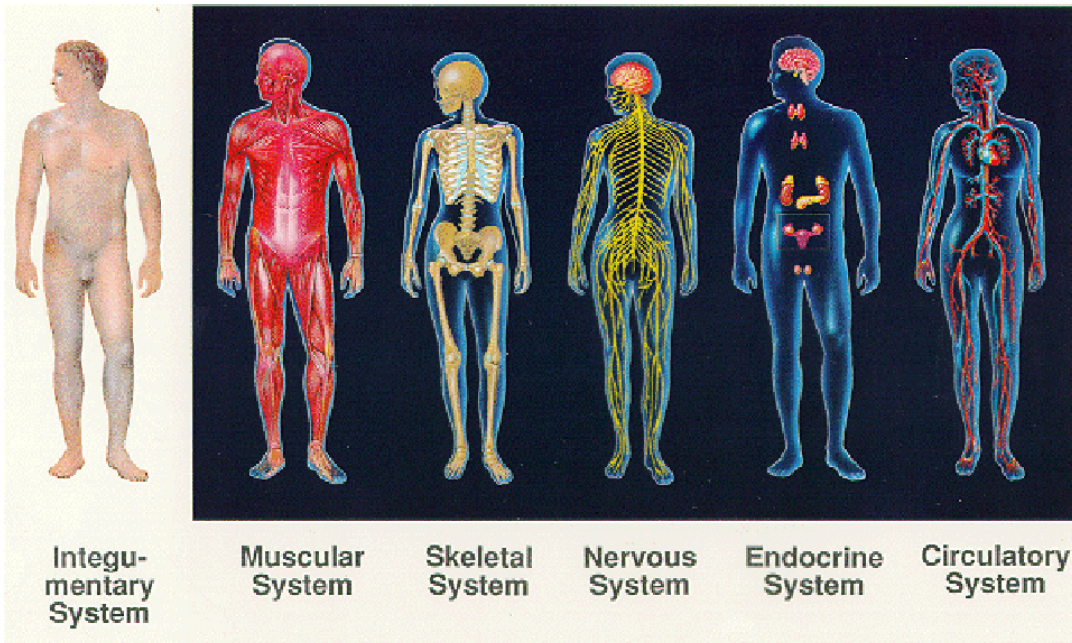


Neurons in aging brain



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Integumentary System

Muscular System

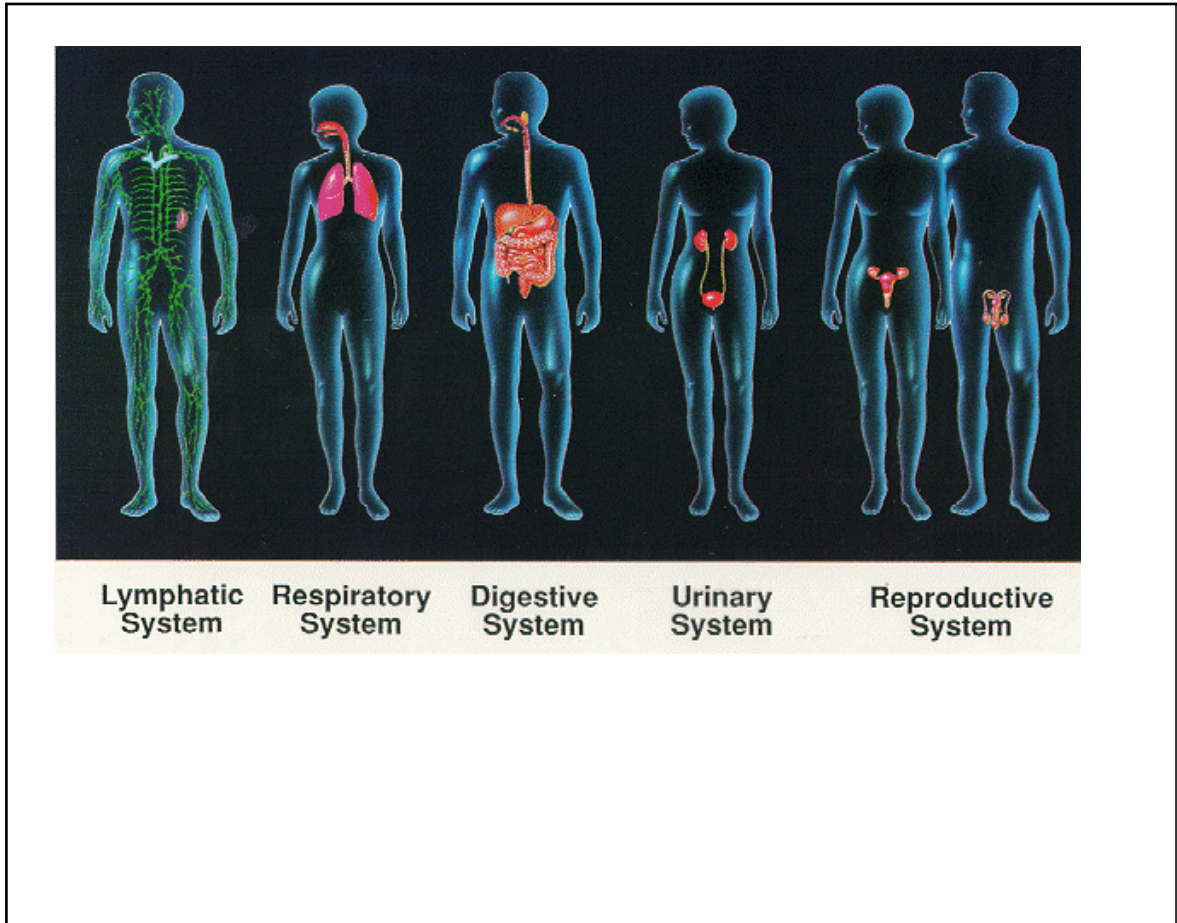
Skeletal System

Nervous System

Endocrine System

Circulatory System

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THE HIERARCHY OF STRUCTURE IN ANIMALS

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Cells are organized in a way that allows them to perform all of life's functions. The cells are organized in a hierarchy. The functioning of an organism depends on the hierarchy of organization within an animal.

hierarchy

The figure below shows an example of the levels of structural organization in a white-tailed deer.

The diagram illustrates the hierarchy of structural organization in a white-tailed deer through five stages:

- Cellular level:** A single heart muscle cell.
- Tissue level:** Heart muscle tissue, showing multiple cells joined together.
- Organ level:** The heart, a complex structure of tissues.
- Organ system level:** The circulatory system, showing the heart and its network of blood vessels.
- Organism level:** The complete white-tailed deer.

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