



## *Tissues, Organs, and Organ Systems*

The cells of most animals interact at three levels of organization: tissues, organs, and organ systems

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## *Outline*

1. **Key concepts**
2. **Organization of the animal body**
3. **Tissues types**
4. **Organ systems**
5. **Conclusions**

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## *Key Concepts:*

1. The cells of most animals interact at three levels of organization: tissues, organs, and organ systems
2. Four types of tissues are seen in most animals: epithelial, connective, muscle, and nervous tissues
3. Each animal cells engages in metabolic activities

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## *Organization of the animal body*

1. Cells - basic structural and functional units.
2. Tissue - a group of cells, usually similar in both structure and function. They are bound together to carry out one or more specialized tasks.
3. Organ - a body part. two or more tissue types that function together.
4. Organ systems - two or more organs that work to perform a common function.

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## *Tissue types*

1. Epithelial tissue - Protective coverings of the body, linings of internal organs.  
cells close together act as a barrier
2. Connective tissue - structural support of body parts, energy storage, etc.  
cells separated by matrix  
tendons, ligaments, cartilage, bone, adipose tissue and blood

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## *Tissue types*

3. Muscle tissue - movement of body parts and internal organs.  
contractible cells
  - A. skeletal - cells very long, voluntary control.
  - B. smooth - line internal organs, involuntary control.
  - C. Cardiac - only in heart, involuntary.
4. Nerve tissue - regulation of body activities by receiving and sending electric signals.  
composed of cells called neurons  
excitable cells

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## Epithelial Tissues

Free surface



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## Glandular Epithelium

Exocrine

Mucus

Saliva

Earwax

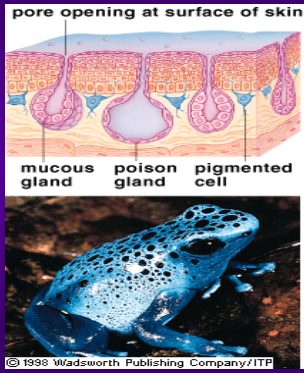
Milk

Oil

Digestive enzymes

Endocrine

Hormones



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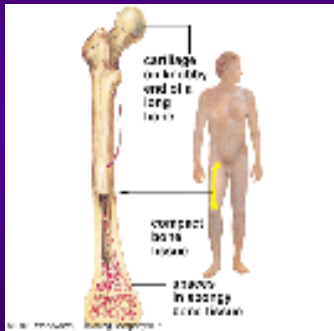
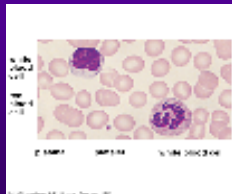
## Connective Tissue

Cartilage

Bone

Adipose tissue

Blood



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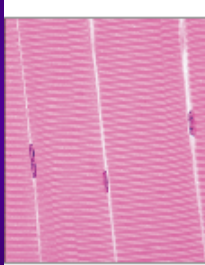
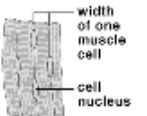
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**Muscle Tissue**

3 types

- Skeletal
- Smooth
- Cardiac

**TYPE:** Skeletal muscle

**DESCRIPTION:** Bundles of long, cylindrical, striated, contractile cells

**LOCATION:** Associated with skeleton

**FUNCTION:** Locomotion, movement of body parts

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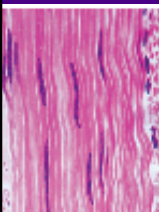
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**Muscle Tissue**

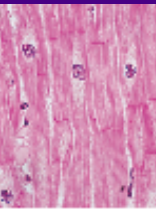


**TYPE:** Smooth muscle

**DESCRIPTION:** Contractile cells with tapered ends

**LOCATION:** Wall of internal organs, such as stomach

**FUNCTION:** Movement of internal organs



**TYPE:** Cardiac muscle

**DESCRIPTION:** Striated, striated cells that have specialized cell junctions

**LOCATION:** Wall of heart

**FUNCTION:** Pump blood with a rhythmic action

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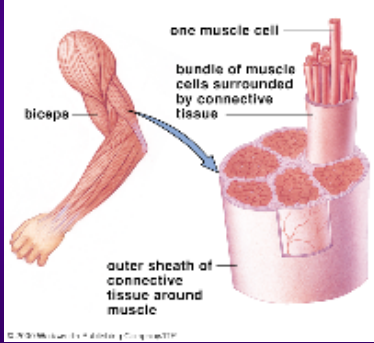
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## Location and General Arrangement of Muscle Cells



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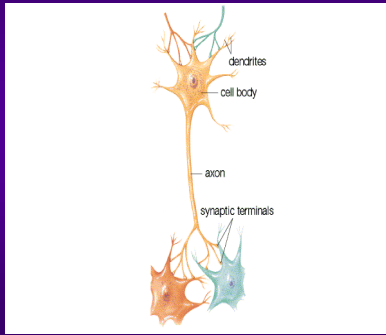
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## Nervous Tissue

Neuron  
Stimulation  
(Electrical charges)



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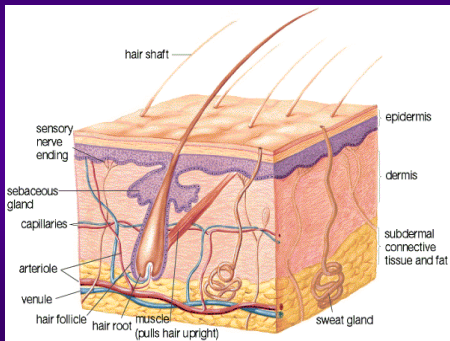
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## Skin - An Organ



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## Organ Systems

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

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## Organ Systems



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## Organ Systems



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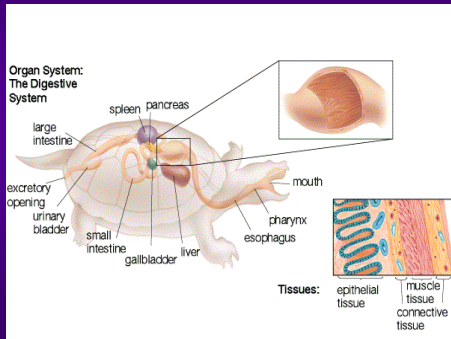
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## An Organ System



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## In Conclusion

1. *A tissue is a group of cells and intercellular substances that perform a common function*
2. *Epithelial tissues cover external body surfaces and line internal cavities and tubes*
3. *Connective tissues bind together, support, strengthen, protect, and insulate other tissues*

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## In Conclusion

4. *Muscle tissues are contractile and move the body or parts of it*
5. *Nervous tissue intercepts and integrates information about internal and external conditions, and governs the body's responses to change*
6. *Tissues, organs, and organ systems work together to maintain homeostasis*

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