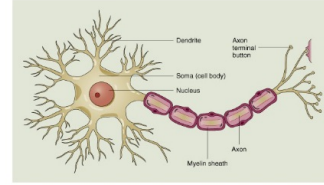


## Lesson 2: Organization of Multicellular Organisms

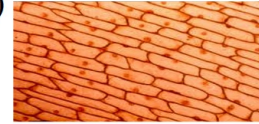
Text Sections: 7.4, 30.1, 30.3, 33.1, 33.3, 23.1, 23.4



### I. The Cell as an Organism

#### A. Unicellular Organisms

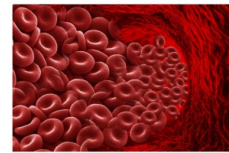
1. must maintain homeostasis (relatively constant internal conditions)
  - a. prokaryotes (bacteria) are adapted to and found nearly everywhere on earth
  - b. unicellular eukaryotes include: protozoans (fresh and saltwater), algae, yeast
2. **Negative feedback systems:** detect changes from set point and trigger responses to bring conditions back to the set point (body temp, blood sugar)



### II. Multicellular Life

#### A. Multicellular Organisms

1. cells work together in an organized way to keep the organism alive
  - a. cells become specialized (**differentiated**) to perform certain jobs and communicate with one another to maintain homeostasis
    - \* **when homeostasis is out of balance, disease or death can result**
  - b. over 250 different cell types perform jobs in the body:
    - \* nerve cells, bone cells, Red Blood Cells, skin cells, etc.

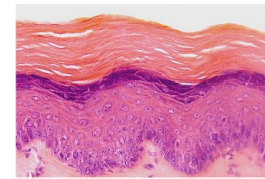
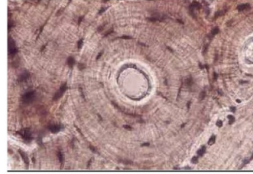
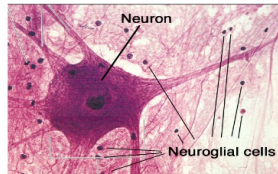
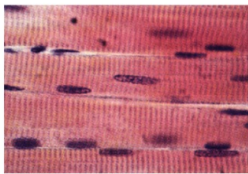


## 2. Levels of Organization

- a. specialized cells perform certain jobs (**differentiation**)
- b. groups of similar cells form **tissues**. Each tissue has its own jobs to do.

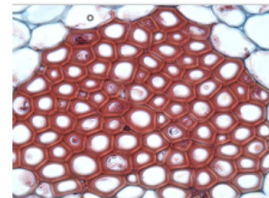
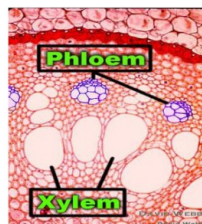
#### \*Types of Animal Tissue:

**muscle tissue** (contract), **nervous tissue** (send messages),  
**connective tissue** (connects and supports), **epithelial** (covers and lines)



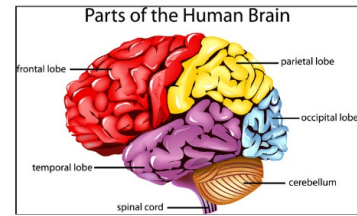
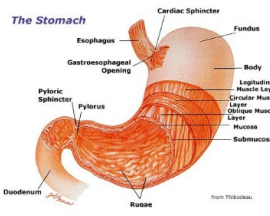
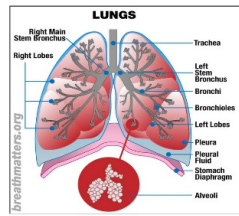
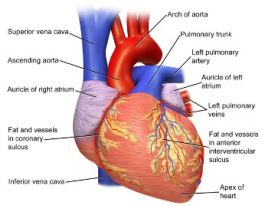
#### \*Types of Plant Tissue:

**dermal tissue** (outer covering), **vascular tissue** [transports water (xylem) and nutrients (phloem)], **ground tissue** (produces sugar & cellulose for support)



c. groups of tissues form **organs**. All organs have a specialized job to do.

**\*Examples of Animal Organs:** heart, lungs, stomach, brain etc



**\*Examples of Plant Organs:** roots, stems, leaves



**d. Organ Systems:** groups of organs and other structures that are specialized to do a specific job

\*organ systems often rely on each other

\*There are 11 organ systems in the Human Body\*

**Nervous, Integumentary, Immune/Lymphatic, Endocrine, Reproductive, Muscular,**

**Circulatory, Skeletal, Respiratory, Digestive and Excretory(Urinary)**

1. Digestion: mouth, esophagus, stomach, liver, pancreas, small intestine and large intestine work together to digest and absorb nutrients from food.

2. Organ systems rely on each other and often work together to keep the body alive.

Ex. digestive and circulatory

<p><b>Nervous System</b></p> <p>Brain, spinal cord, nerves</p> <p>Recognizes and coordinates the body's response to changes in internal and external environments</p>	<p><b>Integumentary System</b></p> <p>Skin, hair, nails, sweat and oil glands</p> <p>Guards against infection and injury and ultraviolet radiation from the sun; helps to regulate body temperature</p>	<p><b>Immune/Lymphatic Systems</b></p> <p>White blood cells, thymus, spleen, lymph nodes, lymph vessels</p> <p>Helps protect the body from disease; collects fluid lost from blood vessels and returns it to the circulatory system</p>	<p><b>Endocrine System</b></p> <p>Hypothalamus, pituitary, thyroid, parathyroids, adrenals, pancreas, ovaries (in females), testes (in males)</p> <p>Controls growth, development, and metabolism; maintains homeostasis</p>	<p><b>Reproductive System</b></p> <p>Testes, epididymis, vas deferens, urethra, and penis (in males); ovaries, Fallopian tubes, uterus, vagina (in females)</p> <p>Produces gametes; in females, nurtures and protects developing embryo</p>	<p><b>Muscular System</b></p> <p>Skeletal muscle, smooth muscle, cardiac muscle</p> <p>Works with skeletal system to produce voluntary movement; helps to circulate blood and move food through the digestive system</p>	<p><b>Circulatory System</b></p> <p>Heart, blood vessels, blood</p> <p>Transports oxygen, nutrients, and hormones to cells; fights infections; removes cell waste; helps to regulate body temperature</p>	<p><b>Skeletal System</b></p> <p>Bones, cartilage, ligaments, tendons</p> <p>Supports the body; protects internal organs; allows movement; stores mineral reserves; contains cells that produce blood cells</p>	<p><b>Respiratory System</b></p> <p>Nose, pharynx, larynx, trachea, bronchi, bronchioles, lungs</p> <p>Brings in oxygen needed for cellular respiration and removes excess carbon dioxide from the body</p>	<p><b>Digestive System</b></p> <p>Mouth, pharynx, esophagus, stomach, small and large intestines, rectum</p> <p>Breaks down food; absorbs nutrients; eliminates wastes</p>	<p><b>Excretory System</b></p> <p>Skin, lungs, liver, kidneys, ureters, urinary bladder, urethra</p> <p>Eliminates waste products from the body</p>
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### III. Plant Structure and Function 23.1

#### A. Tissues and Organs

1. vascular tissue: stacks of cells that form tube-like structures that carry water (xylem) and nutrients(phloem) through the plant
2. mesophyll tissue found in leaves contain cells filled with chloroplasts. This tissue is the home for photosynthesis
3. Dermal tissue:
  - a. the upper side of a leaf is covered with a transparent layer of cells filled with a waxy substance that allows light to pass through while preventing water loss.
  - b. The lower side of a leaf contains special cells that form pores called stomata. Stomata open and close to regulate water balance within the plant

