

Human Anatomy & Physiology

Virtual Tissue Lab (please read all instructions)

Objectives

- To understand the basic structure, function, and location of the four tissue types found in the human body.
- To reinforce and practice identification of the four tissues found in the body.
- To be introduced to one of the many free and valuable internet resources available with which to study the human body

For this virtual lab, you will use your textbook together with histological images from "The JayDoc Histoweb" of the University of Kansas Medical Center. The web address is <http://www.kumc.edu/instruction/medicine/anatomy/histoweb/index.htm>.

Notice the menu buttons on the ride side of the home page. You will view images accessed by clicking on the following menu buttons: epithelia, connective, cartilage, muscle, and nervous. We are skipping both bone and blood as connective tissue types since we will study them in greater depth in later lectures and labs.

Sketch each type of tissue as you work on the following pages in the spaces indicated and give an example of where each tissue type is found. You can use the information at this site, given in lecture, or from your text to name locations.

Be sure to read the accompanying text. ***Don't worry about terminology and specific names of structures not discussed in class.*** Just get the general idea of the structure and its basic characteristics as described in lecture and the textbook.

Epithelial Tissue

Click on "Epithelia".

Notice that each image can be enlarged by clicking on "expanded view".

1. View images 2 (simple squamous)
2. View images 3 and 4 (simple cuboidal)
3. View images 5 and 6 (simple columnar).
4. View images 7 and 8 of "Pseudostratified Columnar" epithelia. Note the presence of cilia and goblet cells
5. View images 9 and 10 of "Transitional" epithelia.
6. View images 11 through 15 of "Stratified Squamous" epithelia. There are images of both keratinizing and non-keratinizing stratified squamous epithelial tissue. Notice the differences in the keratinized layer depending on the skin location.
7. View images 16 and 17 of "Stratified Cuboidal" epithelia. This cell type is not commonly found in the body.

8. Loose and Dense Connective Tissue (CT)

Loose and Dense Connective Tissue (CT)

Click on "Back to the JayDoc Histoweb" at the bottom left corner of the page to return to the main menu.

Click on "Connective".

1. View images 4 through 6 to examine collagen, elastic, and reticular fibers, respectively.
2. View images 7 and 8 of "Loose CT". Notice the various cell types and fibers present.
3. View image 9 of "Dense Irregular CT" and compare it to the two previous images to understand the difference between loose and dense connective tissue.
4. View images 10 through 12 of a tendon.
-Is this an example of loose or dense CT?

Cartilage

Click on "Back to the JayDoc Histoweb" then "Cartilage". *Recall it is a type of supportive or specialized connective tissue.*

1. View images 1 through 3 of "Hyaline" cartilage. Notice the small nests of cartilage cells called chondrocytes sitting in spaces in the matrix called ***lacunae***. Hyaline cartilage is the most prevalent form of cartilage found in the body. Recall that the fetal skeleton is made of this type of cartilage. It is later replaced by bone.
2. View images 4 through 7 of "Elastic" cartilage. Note the large amount of elastic fibers hence its name. Elastic cartilage is more flexible than hyaline cartilage because of the large amount of wavy elastic fibers in its matrix. This type of cartilage provides strength and elasticity.
3. View images 8 through 10 of "Fibrocartilage". Fibrocartilage contains fewer cells than either hyaline or elastic cartilage. Like hyaline cartilage, its matrix contains collagen fibers. Fibrocartilage is made to withstand pressure.

Note that you can sketch either elastic or fibrous cartilage. You do not need to sketch both types. Just be sure to label the cartilage type you have chosen.

Muscle Tissue

Click on "Back to the JayDoc Histoweb" then "Muscle".

1. View images 1 through 7 of "Skeletal" muscle. Notice the peripheral location of the elongated muscle cell nuclei and the presence of alternating dark and light bands that form the cross striations. You will learn more about these bands and skeletal muscle in general when we study the muscular system.
2. View images 8 through 11 of "Smooth" muscle tissue. Notice the spindly shape of the smooth muscle cells their centrally placed nuclei, and the absence of striations.

3. View images 15 through 19 of "Cardiac" muscle. Note the central location of the cell nuclei, the branching of the muscle cells, and the bands connecting several of the cells called intercalated discs. Striations in the cardiac muscle cells can be seen in several of the images.

Nervous Tissue

Click on "Back to the JayDoc Histoweb" then "Nervous".

Nervous tissue is composed of two major cell types, neurons and neuroglial (AKA glial cells). View image 15 of an astrocyte. They are star-shaped cells that perform many functions, including biochemical support of endothelial cells which form the blood-brain barrier, the provision of nutrients to the nervous tissue, and a principal role in the repair and scarring process in the brain. We will learn more about other glial cells and neurons when we study the nervous system

Bone

Click on "Back to the JayDoc Histoweb" then "Bone".

Bone is a solid connective tissue. We will view the detailed structure of the Haversian System of compact bone when we study the skeletal system.

View images 4 and 5 to view compact bone.

Blood

Click on "Back to the JayDoc Histoweb" then "Blood".

Blood is the only example of liquid connective tissue. We will identify the cell types when we study blood and the cardiovascular system.

View images 21, 22, and 24 to view blood.