

Section A: Intro to Histology

Cells are the smallest units of life. In complex organisms, cells group together with one another based on similar structure and function to form **tissues**. Tissues provide the numerous functions of organs necessary to maintain biological life. The study of tissues is called **histology**, and is important to the understanding of how the human body is able to function as a unit. The human body is composed of four basic types of tissues; **epithelium**, **connective**, **muscular**, and **nervous** tissues.

- Epithelium- lines and covers surfaces
 - Connective tissue- protect, support, and bind together
 - Muscular tissue- produces movement
 - Nervous tissue- receive stimuli and conduct impulses
1. Tissues are groups of similar cells working together to ____.
 - a. increase the size and mass of structures
 - b. perform common functions
 - c. deliver messages
 - d. fight against disease
 2. Which type of tissue would make up the majority of the brain and spinal cord? _____
 3. Which type of tissue would be found in the epidermis and form the lining of internal organs such as the intestines? _____
 4. Which type of tissue would form ligaments, tendons, fat and bone? _____
 5. Which type of tissue makes up majority of the heart? _____
 6. How does the type of tissue in an organ relate to its function? _____

Section B: Epithelial Tissue

1. Where are epithelial tissues found within the body? _____

2. What are the functions of the epithelial tissues? _____

3. What do you call the upper or free surface of epithelial tissues? _____
4. What do you call the bottom layer that is attached to connective tissues? _____
5. Epithelial tissue is classified based on two criteria. What are these criteria?

6. Epithelial Cells are said to be avascular. What does this mean?

7. Why is it important for the cells in the lungs and digestive tract to be simple instead of being stratified?

8. Why is it important for the skin to be made up of stratified epithelial tissues instead of simple epithelial?

9. What is unique about transitional epithelium? How is this beneficial? _____

10. What is the function of goblet cells and cilia found within or attached to the epithelium cells? In which epithelium would you find these structures? _____

11. Fill in the missing information in the chart.

Epithelial Tissue	Shape & layer(s)	Location(s)	Functions
Simple Squamous			
Simple Cuboidal			
Simple Columnar			
Pseudostratified Columnar			
Stratified Squamous			
Stratified Cuboidal & Columnar			
Transitional epithelium			
Glandular epithelium			

- Study the slides on my website: on “website” page under Human A&P – Histology & Histology pics links; on “notes” page under Human A&P – Tissue slides.

Section C: Epithelial Concept Check

- Epithelial tissues are _____ which means they have **no blood flow**.
- What type of tissue always can be found underneath epithelial? _____
- All epithelial tissues are **attached** to underlying tissue that holds them in place. What is this membrane called? _____.
- All epithelial tissues are attached to other structures on all surfaces but one. What is the name of the **“free/unattached” surface**? _____.
- Since the epithelial tissues have no blood flow, they are able to receive needed nutrients and expel wastes through the process known as _____.
- Do epithelial cells reproduce rapidly or slowly? _____
- Are epithelial cells tightly packed or loosely spaced? _____
- You’re looking at epithelial tissue in the microscope and notice the specimen has several layers with flattened cells on the apical surface. What type of epithelial tissue are you looking at?

- Which type of epithelial tissue usually forms membranes where filtration or exchange of substances by diffusion occurs? (simple or stratified) _____
- In an area where an epithelium is subjected to considerable wear and tear, you would expect to find (simple or stratified) _____.

Identify the type of epithelial tissue that is found in the following structure(s)

- _____ epidermis, esophagus, oral cavity
- _____ respiratory tract (trachea)
- _____ air sacs/alveoli of the lungs, capillaries
- _____ digestive tract

Section D: Connective Tissue

1. What characteristics do all connective tissues share in common? _____

 2. Identify the functions of connective tissues. _____

 3. Identify at least 2 factors that affect the consistency of a connective tissue. In this case, consistency refers to the make-up or anatomical structure of the tissue. What factors can change the thickness/viscosity of the tissue? _____
 4. What is the extracellular matrix of connective tissue made up of? _____

 5. Why does it take tendons and ligaments longer to heal than many bone injuries? _____

 6. What substances make up the rigid matrix of bone? _____
 7. What are the three types of cartilage? Where are they located in the body?
 - a. _____
 - b. _____
 - c. _____
 8. Identify which type of connective tissue is being described.
 - a. _____ transports oxygen, carbon dioxide, nutrients, and waste through the body by traveling through vessels called arteries and veins.
 - b. _____ is a type of dense connective tissue that connects muscles to bones and connects bone to bone.
 - c. _____ is a type of connective tissue that aids in the formation of red and white blood cells. This tissue is found in the spleen and the marrow.
 - d. _____ is a type of connective tissue with one of the hardest extracellular matrixes that forms a protective structure used for muscle attachment. This type of connective tissue is formed by a cell known as an osteocyte.
 - e. _____ is a type of loose connective tissue that separates the cells of the body from the blood stream. It is a “go-between” for nutrients and wastes to leave and enter the blood stream on their way to and from the bodies’ cells.
 - f. _____ is a type of connective tissue also known as fat. Its purpose is to store excess nutrients and fats as energy. It also serves as a type of insulation for the body.
 - g. _____ is a semi-solid connective tissue that is used as both a protective and supportive structure within the body. This particular type of connective tissue can be found in the nose, ears, ribs, and vertebral disks.
 - h. _____ is a type of dense connective tissue with irregularly arranged fibers that provides strength where tension is exerted in various directions such as in the dermis.
- Study the slides on my website: on “website” page under Human A&P – Histology & Histology pics links; on “notes” page under Human A&P – Tissue slides.

Section E: Connective Tissue Concept Check

1. Where are connective tissue found? _____
2. What are the functions of connective tissue? _____

3. Besides cells what other substances do connective tissues have? _____

4. All connective tissues were derived from a common embryonic tissue. What is the name of the embryonic cells? _____
5. How are connective tissue classified? _____
6. What purpose if any do fibers like collagen and elastin provide in the extracellular matrix of connective tissues? _____

Identify the type of connective tissue based on the following descriptions.

7. _____ contains cells surrounded by a fluid matrix that transports substances
8. _____ contains cells surrounded by a hard matrix that supports and protects
9. _____ contains cells that reduce friction and allow flexibility at joints
10. _____ contains cells that stores energy, insulates the body and cushions organs

Section F: Nervous Tissue

1. What are the two types of cells and how are they different?

Section G: Muscle Tissue

1. What are muscle cells called? _____
2. What are the functions of muscular tissue? _____
3. Check the appropriate space(s) in the following table to indicate which muscle type exhibit the listed characteristic(s). Some characteristics may have more than one correct answer.

	Characteristics	Skeletal	Cardiac	Smooth
A	Striated			
B	No striations			
C	Multinucleated			
D	Uninucleated			
E	Involuntary			
F	Voluntary			
G	Found in the walls of hollow organs			
H	Attached to connective tissue			
I	Found in the heart			

Section H: Tissue Repair

1. What is the difference between regeneration and fibrosis?

Section I: Tissue Review

Identify the type of tissue from the description below.

C = connective N = nervous E = epithelial M = muscular

1. _____ contains large amount of extracellular matrix and possesses fibers
2. _____ has a free apical surface and attached basement membrane
3. _____ composed of neurons and neuroglia
4. _____ cells are tightly packed forming continuous cellular sheets
5. _____ highly vascular with elongated cells called fibers
6. _____ involved in secretion, absorption and protection
7. _____ originates from mesenchyme
8. _____ avascular
9. _____ regenerates the quickest of all tissue
10. _____ relies on nutrients from underlying areolar tissue
11. _____ covers surfaces, either outside or inside the body
12. _____ may have multiple nuclei and striations
13. _____ replaces damaged tissue during fibrosis
14. _____ primary tissue found in glands
15. _____ supports, protects, storage and attachment
16. _____ receive, integrate and conduct impulses throughout the body
17. _____ involved in movement of body, posture and heat production
18. _____ most common type of tissue

Section J: Tissue Family Reunion

Your job is to write out a story about the Tissue Family Reunion which includes the following family members: epithelial, connective, nervous, muscular. All of the tissues have “Grown Up” and moved away from home. Each now lives in a new place and has their own job and they have come home for the annual family reunion. Your job is to write a story that details their conversation as they all get together and discuss where they “live” and what they now “do.” It is your decision as to the format that you would like to use. For example you could write a story in paragraph or script formats that identifies the job and location of each tissue. To help with this process, you will want to give each one of your tissues a name.

- You don't have to include each specific type of epithelial, connective, nervous or muscular tissues.

You will be assessed on:

Correctly identifying the location and examples of each tissue.

Correctly identifying the function of each tissue.

Correctly identifying characteristics of each tissue.

Extra points may be awarded on creativity.

Epithelial Tissue _____ out of 12 pts
Connective Tissue _____ out of 12 pts
Nervous Tissue _____ out of 12 pts
Muscular Tissue _____ out of 12 pts

Grade _____/48 pts.

Tissue Family Reunion – Grading Rubric

	EXCELLENT (4)	GOOD (3)	FAIR (2)	NEEDS IMPROVEMENT (1)
Location & Examples of tissue	Information clearly relates to main topic. It includes several supporting details and data. Background research, investigative data, and observer's prior knowledge are used to fully address all topics and answer all questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. It includes a few supporting details and data. Background research, investigative data, and observer's prior knowledge are used to address most topics and answer most questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge are used to address some topics and answer some questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.	Information has little or nothing to do with the main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge is not used to address any topic or answer any questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.
Function of tissue	Information clearly relates to main topic. It includes several supporting details and data. Background research, investigative data, and observer's prior knowledge are used to fully address all topics and answer all questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. It includes a few supporting details and data. Background research, investigative data, and observer's prior knowledge are used to address most topics and answer most questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge are used to address some topics and answer some questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.	Information has little or nothing to do with the main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge is not used to address any topic or answer any questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.
Characteristics of tissue	Information clearly relates to main topic. It includes several supporting details and data. Background research, investigative data, and observer's prior knowledge are used to fully address all topics and answer all questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. It includes a few supporting details and data. Background research, investigative data, and observer's prior knowledge are used to address most topics and answer most questions. Appropriate data was collected, evaluated and then used to make the analysis and conclusion.	Information clearly relates to main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge are used to address some topics and answer some questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.	Information has little or nothing to do with the main topic. No supporting details and data are provided. Background research, investigative data, and observer's prior knowledge is not used to address any topic or answer any questions. Appropriate data was not collected, evaluated and then used to make analysis and conclusion.

- ❖ Under Human A&P page, click on 'Websites'....click on "Connective & Muscular Tissue" and "Epithelial & Nervous Tissue" to study. Other links to help study:
<http://quizlet.com/3031523/anatomy-tissues-quiz-flash-cards/> click on tabs
<http://msjensen.cehd.umn.edu/webanatomy/histology/default.html> quizzes