

Tissues

Introduction

As you will be doing something that “violates” the integrity of the human body, it is appropriate that you have a brief lab overview exercise on tissues.

Tissues are combinations of various molecules, e.g., proteins, complex forms of carbohydrates, lipids and nucleic acids, which are genetically directed in their nucleus, which contains the DNA, i.e., the “brains” of this sub-cellular orchestration.

While performing this experiment, refer regularly to the online lecture and graphics so that you can see what “textbook” images look like and what you get for \$2.50, commercially prepared in bulk.

Different structures of the body require different kinds of cells which make different tissues in an organ for a specific function. One example is a kind of tissue found exclusively in the trachea (windpipe). This tissue is called ciliated pseudostratified columnar epithelium. The purpose of the cilia is to move debris from the bronchi to the throat for expulsion. Nicotine partially paralyzes these cilia in smoker’s lungs and this defense mechanism is inactivated.

Squamous epithelium you have already observed in your cheek smear in your previous lab experiment. Simple squamous epithelium functions where filtration processes occur, e.g., lung, kidney, blood lymph vessels. These cells are the simplest kind of epithelial types.

Connective tissues help hold various organ [systems] together and/or protect them. One obvious tissue example of protection is adipose (fat) tissue. Fat cushions our organs and gives our bodies shape. Microscopically, it resembles chicken wire. The dark “dot” at the outer edge of each cell is the nucleus.

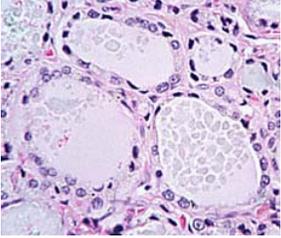
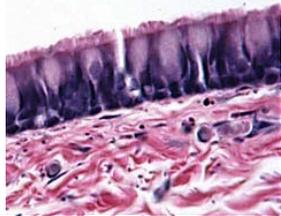
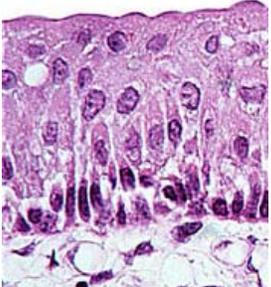
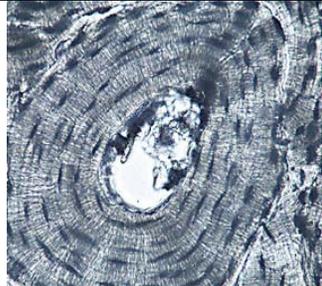
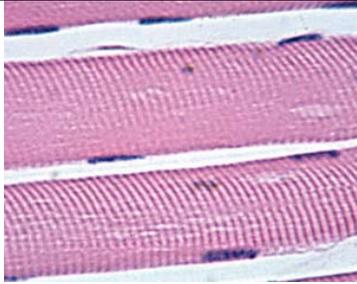
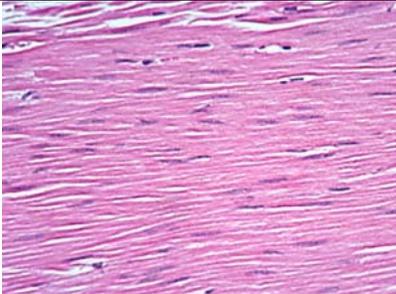
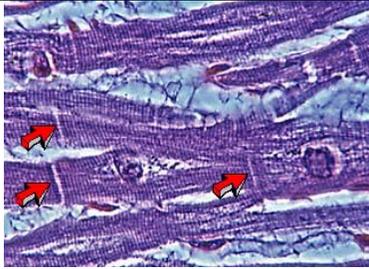
Osseous tissue, i.e., bony tissue, gives support and protection to the body. Bones protect the body by enclosing organs like the skull around the brain, the ribs around the heart and lungs and the pelvis around the internal reproductive organs.

Bones also serve as stores of minerals such as calcium, phosphorus and magnesium. This is particularly important for women who are pregnant. These bony tissues, if necessary, will provide the calcium and phosphorus to the developing fetus for appropriate growth.

Inside the long and flat bones there are cavities. These cavities contain bone marrow. The bone marrow at the ends of these bones is red. This marrow is responsible for producing the blood cells: red blood cells (RBC), white blood cells (WBC) and platelets. RBC are necessary for proper gas (oxygen and carbon dioxide) transfer. WBC are necessary to help combat infections, allergic reactions and to provide immunity from various diseases. Platelets provide a framework for clot formation.

Three kinds of muscle tissue are found in the human: skeletal, smooth and cardiac. Skeletal muscle is under conscious control and is the type of muscle used for bodily movements. Smooth muscle is found around hollow organs like blood vessels and the bowel. Smooth muscle is NOT under conscious control. Cardiac muscle is found only in the heart and is involuntary. Notice that both cardiac and skeletal muscle tissues are striated, but that only cardiac muscle has intercalated disks. Intercalated disks increase the speed of impulses between the fibers to facilitate uniform contraction in the heart.

In the table, below, are examples of 9 kinds of tissues and their sources:

		
Simple cuboidal epithelium (thyroid follicle)	Simple columnar epithelium (gall bladder)	Pseudostratified ciliated columnar epithelium (trachea)
		
Transitional epithelium (urinary bladder)	Stratified squamous epithelium (vagina)	Bone
		
Skeletal Muscle	Smooth Muscle	Cardiac Muscle

Experimental: Supplies

Microscope	Prepared Tissue Slides (Your instructor will show you which ones to examine.)	Colored Pencils/Pens	Tissues Lecture
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Experimental: Methods

Using your new skills with the microscope, examine each of the slides in the tray and draw and label what you see in the spaces, below. Note that you may not use all of the spaces, below.
