Lab #5 Connective Tissues
Imaging the Body, Fall 05

Objectives

The objectives of this lab exercise are to:

- Observe various types of connective tissues;
- Observe and become familiar with the differences between cardiac, skeletal and smooth muscle tissues;
- Learn to prepare and observe various tissues using compound microscopes;
- Gain additional skills using a compound microscope.

Exercise

Record all your observations and drawings in your lab/sketching notebook. All your sketches should have a title that includes magnification and any discernible structures should be clearly labeled.

1. **Observe prepared slides** of the following tissues. Sketch and label the structures indicated.

Tissue	Structures to observe and label
Cardiac muscle	Muscle cells, nucleus, striations, intercalated discs
Smooth muscle	Make sure that you're looking at the muscle, not the absorptive structures on the interior of the gut. Smooth muscle cells, nucleus
Skeletal muscle	Muscle fibers, striations, nucleus
Hyaline cartilage	Chondrocytes, lacuna, intercellular matrix
White fibrous tissue	This is tendon tissue. Fibroblast cells, collagen fibers
Human blood	Red blood cells, white blood cells

2. **Prepare and observe fresh-mount slides of cheek cells**.
    a. Get a paper towel, a slide and a cover slip. Place the slide on the paper towel and do your preparations with the slide on the towel.
    b. Using a fresh toothpick, gently scrape the inside of your cheek and deposit the scrapings onto a microscope slide.
    c. Put a small drop of methylene blue stain on the slide next to the scrapings and mix it with the scrapings using the toothpick. Put a cover slip on top of the stain and gently tap it down. Remove any excess stain with a paper towel.
    d. Observe and draw what you see. Label any visible structures (nucleus, cell membrane).

3. **Preparation of fresh connective tissue mounts from the bone sections (optional, but recommended).** You can prepare and observe skeletal muscle, tendon, and fascia tissue.
    a. Use a razor blade to remove the smallest possible piece of tissue. Place a small drop of methylene blue stain next to the tissue piece and use a dissecting needle to spread out the tissue.
    b. Place a cover slip onto the tissue and gently smoosh the tissue. Try to get all the air bubbles out.
4. **Prepare and observe fresh-mount slides of human blood cells (optional, but recommended).**
    a. Take a clean slide over to the bloodletting area.
    b. Be very careful with lancet. Load a fresh lancet into the spring-loaded device.
    c. Clean your finger with an alcohol swab and use the lancet to puncture your finger.
    d. Squeeze out a small drop of blood onto a slide. Wipe your finger and cover with a band-aid.
    e. Put a cover slip on the blood drop, observe and sketch. Locate and sketch white blood cells.
5. **Totally optional, looking for follicle mites**. Follicle mites are these little critters that live in our hair follicles. You can look for them by scraping your forehead right at your hair line with the curved end of a bobby pin and then transfer the scrapings to a slide. Stain, add a cover slip and go hunting.

Fig. 6. The follicle mite.

Questions

1. Why are the cardiac muscle cells connected with intercalated discs? Think about how they have to function as compared to skeletal muscles.
2. Based on your observations, construct a dichotomous (two-choice) key to the various types of tissues that you observed on the prepared slides. At each step in the key, you choose between two choices that eventually bring you to the proper tissue. For example, your first key question could be:

    1 a. Cells organized into a distinct tissue? Go to #2
    1 b. Cells unconnected, individual cells by themselves. Blood cells