BIOL 239 Experimental Microbiology, Spring 2014 **Prof. Joan Slonczewski**

Lab 1. Observing Protists.

Bring S&F Chapter 2; Read pages 49-55 carefully. Use these pages to adjust your microscope.
Background reading: review S&F Chapter 20 Eukaryotic Diversity.
The purpose of this lab is:

- To use a bright-field light microscope and see how magnification works
- To learn how to find an organism under a microscope and observe its structures
- To observe eukaryotic microbes and distinguish different kinds

Start with prepared slide of diatoms. Then view living specimens.
(1) Make sure you know the parts of your microscope.
(2) Observe specimen first at 100X (10X objective), then at 400X (40X objective).

Do not use 1000X today because the lens requires oil immersion. Never observe 1000X without oil. We will use oil immersion next week, for Lab 2.

- Sketch each organism at 400X. Use pencil on unlined paper.
- Label interesting observations such as organelles, color, movement.
- State species if known; indicate an educated guess, if not known (i.e. "possible mold filaments")
- State full magnification, showing calculation for each specimen (ocular x objective).
- State cell size, calculated from ocular micrometer. In the micrometer, 1 unit represents 1 mm. Because light reaches the micrometer after passing the objective lens, it has not undergone objective magnification. Thus, when using the micrometer to measure the specimen, divide each measured length by the objective magnification (for example, 1 mm / 40X = 0.025 mm = 25 μm). Show calculation for each specimen.

Drawings required:

- Prepared slide of algae—show two or three whole organisms
- Three different live protists. Fill the whole page with your sketch. Some cultures include more than one type of organism; sketch more than one member, and hypothesize as to how they interact in the community.
- Bacteria (*Bacillus megaterium*)**. How does their size compare with the size of the eukaryotes?**
- **Scan all drawings.** Use Photoshop or Paintshop to crop and decrease size as necessary. Keep individual image sizes below 500kb.
- Include one well-focused **photo** of a live eukaryote. In Photoshop or Paintshop, adjust contrast for clarity. Crop to an appropriate portion of the field. **Reduce size to <500kb.**

3:00pm: Bring sketches to Bio Office, 2nd floor, where Ms. Busenburg-Taylor will demonstrate the scanner/email function of photocopiers (outer office and Reading Room).

Prepare ahead for Lab 2:

- Pour 4 plates, from 250-ml flask containing 100 ml Tryptic Soy Agar (TSA)**.**

Report: Submit by Moodle, with all images embedded in Word.
Introduction: A paragraph stating what you gained from this lab.
Methods: Summarize the methods used for sample prep and microscopy.
Results: Drawings required, plus any explanatory comments.
Discussion: Answer these questions.

1. From your own experience: How can you tell when an object is in focus? Sketch an example.
2. What organelles did you see within the eukaryotic cells?
3. What ecological relationships can you hypothesize among some of the organisms?
4. How do bacteria (*B. megaterium*) differ from the protists you saw?