

Lab 1. Observing microbes. Read Leboffe Ex 1-1, 3-1, 3-3.

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

Use microscope to observe organisms in liquid or cultured on agar. Make sure you know the parts of your microscope. Observe 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 (ocular x objective).
- Cell size calculated from micrometer. Behind ocular, 1 unit = 1 mm; divide by objective lens magnification. Figure out the conversion at each magnification. Show all calculations.

Drawings required

- Prepared slide of algae—show two or three whole organisms
- Three different live protists. 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*)

Photos required

- One well-focused photo of a live protist. In Photoshop or Paintshop, adjust contrast for clarity. Show an appropriate portion of the field.

Prepare ahead for Lab 2:

- Pour 4 plates, from 250-ml flask containing 100 ml Tryptic Soy Agar.
- Inoculate previously-poured plate with dust from lab bench.

Requirements for Lab 1 writeup

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. How can you tell when an object is in focus? What does it look when the lens is too close? Too far? (Base on your own experience; sketch an example).
2. How do protists differ in appearance from algae?
3. What organelles did you see within the eukaryotic cells?
4. What ecological relationships can you hypothesize among some of the organisms?
5. How do bacteria (*B. megaterium*) differ from the protists you saw?