

**Microbiology Lab 3051 (Spring 2016)**  
**Mid-Term Laboratory Exam**  
**Study Guide**  
**Labs 1 - 5**

**Objectives:**

1. Know the parts of the microscope and their functions.
2. Know how to use the microscope (adjusting for proper viewing, getting an image in focus, using oil immersion) and how to take care of a microscope.
3. Describe aseptic technique and understand why it is important.
  - a. Aseptic Technique: sterilize inoculating loop by holding it over flame of Bunsen burner → flame mouth of tube → insert loop → remove loop → flame mouth → cap tube
  - b. Insures that no contaminating organisms are introduced into culture materials when the latter are inoculated or handled in some manner.
  - c. Insures that organisms are being handled do not contaminate the handler or others who may be present.
4. Compare and contrast how to make a bacterial smear from liquid media and solid media.
  - a. Liquid Media – two loopfuls of liquid containing organisms are placed in the center of the “target circle” → organisms are dispersed over entire area of “target circle” → the smear is allowed to dry at room temperature → slide is passed through flame several times to heat-kill and fix organisms to slide.
  - b. Solid Media – two loopfuls of water are placed in center of “target circle” → a very small amount of organisms is dispersed with inoculating loop in water over entire area of “target circle” → the smear is allowed to dry at room temperature → slide is passed through flame several times to heat-kill and fix organisms to slide.
5. Explain the importance of heat fixing and air-drying specimens on slides.
  - a. Heat-fixing
  - b. Air-drying
6. Distinguish between acidic and basic dyes and when to use each.
  - a. Basic dyes – dyes that have cationic chromophores
  - b. Acidic dyes – dyes that have anionic chromophores
7. Describe simple staining and what bacterial characteristics can be observed using this technique.
  - a. Simple staining – the use of a single stain to color a bacterial cell
  - b. Works well on bacteria that have color-bearing ions (chromophores) and are positively charged.
8. Recognize the different bacterial morphologies.
  - a. Bacilli – rods
    - i. Coccobacillus
    - ii. Bacilli
    - iii. Fusiform
  - b. Cocci – spherical
  - c. Spirals – curved rods
9. Understand the distribution of bacteria in our world.
  - a.
10. Compare and contrast gram-positive and gram-negative cells (what colors they stain using the Gram stain and how cell wall structure determines how they stain).

# Microbiology Lab Midterm Study Guide

**John Harley**



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