

Miramar College
Biology 205 General Microbiology
Lab Exam III Study Guide

In addition to this study guide, use your notes, text, lab manual and other resources (*i.e.*, **the Objectives & Discussion section of the Labs and the bold words in the Background and Introduction sections**) to make sure that you are fully prepared for your exam. Topics & experiments covered in lab are fair game, even if you personally did not perform them.

Physiological & Biochemical Tests for Minor & Major unknowns

- For all of the tests performed in lab, be able to identify: the media used, the chemical being tested, a positive and negative result, the microbial enzyme(s) involved, and products being produced. **You WILL see several of these media out and you will need to determine “what’s happening.”** For example, if you are shown a Lactose Durham Tube that is cloudy, yellow and has marked gas in the inverted vial: the organism has the enzyme lactase and has fermented lactose, producing both acid & gas, this is visible because the pH indicator Phenol Red has turned yellow, which happens in acidic media. The *Media Use Descriptions* at the end of the Lab Manual will be very useful for this purpose.
- Be familiar with the use of dichotomous keys to determine the genus to which a bacterial unknown belongs.

LE 21: Simulated Epidemic

- Define dead pathogen, attenuated, toxoid, and subunit immunizations. Define herd immunity.
- Understand how herd immunity and host susceptibility affect flu prognosis.

Staphylococci: Isolation & Identification

- Know introductory material, including the use of Mannitol Salt Agar and m-*Staph* medium.
- Know the tests that were available to you in class that help to differentiate between staphylococcal species, and which tests were done to isolate a *Staphylococcus* species.
- Recognize an unknown *Staphylococcus* as *S. aureus*, *S. epidermidis*, and *S. saprophyticus* based on their mannitol fermentation, Novobiocin susceptibility, coagulase production, and α -toxin production.
- Recognize staphylococcal bacteria on a Gram stain.
- Understand how each of the tests performed in lab is used to determine an unknown *Staphylococcus* species, use *SSE Media Use Descriptions* in the Lab Manual.

Streptococci: Isolation & Identification

- Know introductory material, including the use of Blood Agar and Brain-Heart Infusion Agar.
- Differentiate between γ -hemolysis, α -hemolysis, and β -hemolysis and know which media is used to determine this property.
- Recognize streptococcal bacteria on a Gram stain.
- Understand how to determine a streptococcal species using the table in the SSE handout.
- Understand how each of the tests performed in lab is used to determine an unknown *Streptococcus/Enterococcus* species, use *SSE Media Use Descriptions* in the Lab Manual.

Gram-Negative Enteric Organisms

- Define enteric.
- Know introductory material, including the use of MacConkey Agar and Eosin Methylene Blue Agar.
- Know the tests routinely used to differentiate normal flora from pathogens, and the pathogens used in this lab.
- Recognize enteric bacteria on a Gram stain.
- Understand how each of the tests performed in lab is used to determine an unknown Enteric species, use *SSE Media Use Descriptions* in the Lab Manual.

LE 23: ELISA

- What is an ELISA? Why are antigens and antibodies central to the ELISA?
- What are the basic steps of an ELISA, how is an indirect ELISA different from a direct ELISA?
- Why is proper washing between steps of an ELISA so important?
- Recognize positive and negative ELISA results. Why is the ELISA such a sensitive/specific serological test?

The Major Unknown

- Know the characteristics used to determine the bacterial genera for Gram positive and Gram negative organisms. (See the dichotomous keys in the Lab Manual for details.)
- Know how to use Bergey's Manual of Determinative Bacteriology to decide a strategy for isolate identification.