

**Microbiology 2400  
Study Guide #11  
Winter Semester 2008  
E. Hoffman**

## **LABORATORY SECTION**

### **TRANSFORMATION**

**For textbook information regarding this exercise, refer to Chapter 8 Note: there is no material in your laboratory manual concerning this exercise. See your class notes for additional information**

1. What bacterial species did you attempt to transform?
2. What traits did the transformed bacteria receive?
  1. The above traits were included in what larger structure?
  2. What two things were done to the bacterium to induce it to become competent?
  3. Generally describe how you determined if the bacterium had undergone transformation.
  4. You should be able to briefly describe how a bacterium acquires new genes via the transformation process.
7. Some of the Petri Plates contained the sugar, arabinose. What is the function of the sugar in this exercise?
8. What does the acronym, GFP stand for, in the context of this exercise? Where did the gene that controls the production of this protein originally come from?
9. How did you locate, bacterial colonies which were able to produce this protein (GFP)?

### **Bacterial Conjugation**

**For textbook Information regarding this exercise, refer to Chapter 8  
See class notes for additional information**

1. What bacterial species did you make use of during this laboratory designed to introduce you to the phenomenon of conjugation?
2. The genes involved in the conjugation demonstration regulated the ability of the above bacterium to \_\_\_\_\_. Specifically, one strain was resistant to \_\_\_\_ while the other was resistant to \_\_\_\_\_.
3. How did you confirm the resistance of each strain?
4. In the process of conjugation, the cells involved must actually \_\_\_\_ with each other if the genetic exchange is going to occur. What is a pilus? What, in general, is its role in the conjugation process?
5. What genetic trait moved between the cells during the conjugation process? In what type of structure was the trait located?

### **Bacterial transduction**

**For information concerning transduction, please see chapter 8 of your textbook and class notes.**

1. What was the name of the bacterium that you tried to transduce in this exercise?
2. What trait(s) did you try to insert into the receiver bacterium?
3. It was hoped that the trait (s) would be inserted into the receiver bacterium by the action of a \_\_\_\_\_.
4. How did you know if the transduction attempt was indeed successful?
5. You made use of two different strains of the bacterium mentioned in question #1. What was the major difference in these strains?

### **Phage Assay for the Determination of Phage Titer**

**For textbook information regarding this exercise, please refer to chapter 13. You should also see your class notes for information to aid you in answering these questions.**

1. What is a phage?

2. Why can't you determine the number of T4 phages/ml by doing a standard plate count or a direct count?
3. What is a plaque?
4. You should be able to generally describe how you determined the number of T4 phage particles/ml?
5. What does the term, viral titer mean in the context of viral numbers?

### **Amebiasis**

**For the answers to these questions you will need to refer to the online microbiology book that I have referred to in class. There is a link to this site at the bottom of your first day handout (see the online version of this handout). When you get to the online text, click on the parasitology section, and then click on the first chapter. The material you will need is at the beginning of this chapter.**

1. What species is the major cause of this problem?
2. What percentage of the US population is thought to be infected?
3. What major microbial group is this parasite associated (fungi, bacteria, protozoan etc)?
4. This parasite comes in two distinct forms. What are their names?
5. The ingestion of what stage in the life of this parasite, results in infection (under normal circumstances)?
6. Look under the diagnosis section. What is the confirmatory test for determining infection?

## **LECTURE SECTION**

1. Another entirely different approach to the sterilization of materials makes use of chemical agents. Probably the most common substance used to chemically sterilize materials is \_\_\_\_\_. This substance is used in an autoclave-like instrument known as a \_\_\_\_\_.
2. Chemical sterilization is used in some circumstances to sterilize materials that can't be placed into an autoclave because of their sensitivity to \_\_\_\_\_. In addition to these types of

materials, the other situation in which chemical sterilization would be very useful would involve the sterilization of \_\_\_\_.

3. Another technique that can be applied to both fluids and gases involves the use of \_\_\_\_ to sterilize.
4. Generally speaking, very \_\_\_\_ microbes provide the greatest problems if you are trying to filter sterilize a material. What major group of microbes would present the greatest challenge to the filter sterilization process?
5. Lastly, you were introduced to the use of radiation to sterilize materials. There are 4 forms of radiation that are commonly used for the purpose of sterilization. What are they? Which one of the forms has very little ability to penetrate into materials? Which of the forms is generally considered to have marked penetration ability?
6. If you are discussing any kind of antimicrobial agent, the term, mode of action is applicable. What is meant by this term? What is the mode of action of germicidal wavelengths of UV radiation?
7. A brief period of time was spent discussing the process of pasteurization. How did I define this type of microbial control?
- 8.. As an example of the use of pasteurization, I cited the pasteurization of milk. This process originated as an attempt to protect us from acquiring the bacterium, which causes \_\_\_\_\_. Why would you expect to find this bacterium in milk on occasion?
9. You were also introduced to environmental manipulation as a means to control the growth of microorganisms. What were the 4 aspects of the microbial environment that were mentioned in class as being frequently subjected to manipulation?
10. Another approach to the control of microbial populations that was noted in class involved their control by the use of various chemicals. The modern era, in regard, grew out the interest of \_\_\_\_ (name of investigator) in the control of infections
11. The above-mentioned individual initially used \_\_\_\_ in an attempt to control infections.
12. What comment did I make concerning the chemical nature of disinfectants and antiseptics. What kind of surfaces are disinfectants designed to be used on? What kind of surfaces are antiseptics designed to be used on?
13. If a disinfectant is described as being germicidal, what does that imply? If it was described as being bacteriostatic, what does that imply?

14. Your textbook author lists several factors in chapter 7, which influence the effectiveness of antimicrobial treatments. What were the four that were listed?

**Note: see your textbook. Do not ask me about this question.**

15. All methods of microbial control have a mechanism of action or what some individuals call the **mode of action**. Since the autoclave is probably the most common piece of sterilizing equipment that you will see in the future, what is its mode of action?

**Note: see your textbook, page 185. Do not ask me about this question.**

16. It was noted in class, there are two major reasons for doing some “checking” before autoclaving materials that you are not familiar with. What were those reasons? Note, the same can be said for other forms of sterilization but since autoclaving is the most commonly employed technique, your examples came from the use of an autoclave.

