

**Microbiology 2400
Study Guide #9
Winter Semester 2008
E. Hoffman**

LABORATORY SECTION

The following laboratory questions are based on the demonstration materials put at the front of laboratory

Neisseria gonorrhoeae

1. As your textbook notes, it is very important for these bacteria to attach to cells of the body if they are going to be successful in maintaining themselves in the body. What is the structure that these bacteria have that allows them to attach to body cells?
2. Your textbook describes a condition known as ophthalmia neonatorum. What does this condition describe?
3. The gonorrhea causing bacteria are somewhat unusual in that although they are cocci, their Gram reaction is ___ in nature.
4. Of the STDs that are caused by bacterial organisms that are mentioned in your textbook, where does gonorrhea rank in terms of number of cases in the USA on a yearly basis?

Trichomonas vaginalis

1. You had the opportunity to view this organism via the front cover of the January 12, 2007 issue of Science. This is another agent of STD. Unlike the bacterial forms that you have been introduced to, this disease agent is a form of ___.
2. According to the data in your textbook, approximately how many Americans contract this disease agent in a year?
3. Generally speaking, what is the treatment for this condition?
4. While both males and females can show symptoms, it is more common for infected ___ to be asymptomatic for this condition.

Giardia lamblia

**See your textbook as well as on line microbiology book mentioned in your first day
handout.**

1. This microbe was mentioned the laboratory but you were not able to view a demonstration microscope because the slide which illustrates it could not be located. This microbe belongs to which major group of microorganisms (fungi, bacteria, protozoans, algae, etc)?
2. This is the most common cause of ____ borne illness in the USA. The problems brought about by having this organism in the human body are mostly associated with what body system?
3. This microbe is, in a sense, more likely to cause us a problem than *Trichomonas vaginalis* because of its ability to form what are called ____.
4. What is the standard methods to acquire this particular infection?

Cryptosporidiosis

See your textbook as well as on line microbiology book mentioned in your first day handout.

1. This microbe belongs to what major group of microorganisms?
2. As your textbook notes, the microbe was thought to not be a particular hazard to man. What major American city was hit by a major outbreak illness due to this microbe? How did the microbe reach the people it infected?
3. This microbe normally causes problems in what organ system of the body?
4. How is this microbe normally acquired by people?

LECTURE SECTION

1. You were introduced to several ways to determine bacterial numbers. You should be able to briefly describe how the following number determination methods achieve their ends:
 - a. Standard Plate Count.
 - b. Direct Count
 - c. Turbidimetric Measures.
 - d. MPN.
2. What were the two major reasons cited for the existence of the LAG phase of the growth curve? Under what two circumstances (When) would you expect to encounter a LAG phase if you were cultivating or growing bacteria in culture?

3. The LOG phase of the growth curve is marked by the ___ growth rate of the bacterium.
4. Show by means of a labeled graph, how you would calculate the generation time of a bacterium.
5. If you had a bacterial species, which doubled every 30 minutes, and you started with 10 bacteria, how many would you have at the end of a 4-hour growth time? You should be able to use the following formula for this problem:

$$X_t = 2^{kt} (X_0)$$

6. The stationary phase is indicated by a ___ rate that is equal to the ___ rate for the culture.
7. The stationary phase is usually triggered by a “limiting factor”. What, in general, are limiting factors? In the case of bacterial cultures, three potential classes of limiting factors were noted. What were they?
8. The death phase of a culture is marked by a situation where ___ of cells is greater than ___. Cite 2 factors that have the potential to cause cell death.
9. What are the two general methods employed to cultivate microorganisms? Which method have you employed in the laboratory?
10. What is a chemostat? Which of the above methods of cultivation is it used in?

11. One the most significant of “mother natures” chemostats is the rumen.
- a. Briefly, what is a rumen?
 - b. You should be able to cite 2 examples of animals, which have rumens.
 - c. Rumen microbes have the ability to digest what wide-spread polysaccharide?
 - d. Generally speaking, the metabolism of the above mentioned polysaccharide via fermentation leads to the production of ___ acids which pass into the animal’s circulatory system and serve as the primary source of **energy** to run the organism. The above mentioned metabolism also leads to the production of the gas, ___ which leaves animal by the process of eructation or ___.
 - e. Since the rumen is also a structure in which microbes reproduce, excess microbial cells accumulate in the rumen. This activity should lead to the production of other nutrients for the animal. You should be able to cite 2 such groups.
 - f. Ruminant animals have proven to be very useful to man. What is the basic reason for their usefulness to us?