

Miramar College
Biology 205 Microbiology
Midterm Exam II Study Guide

These learning objectives are intended as a study guide. This is not necessarily a complete guide and as such is not intended to be the sole source of your studies. You should use your notes, text, lab manuals, and other resources in order to make sure that you are fully prepared for your exam.

Define the following terms:

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|---------------------------|---------------------------|------------------|
| ▪ pathology | ▪ septicemia | ▪ acute |
| ▪ etiology | ▪ toxemia | ▪ chronic |
| ▪ pathogenesis | ▪ primary infection | ▪ subacute |
| ▪ infection | ▪ secondary infection | ▪ endemic |
| ▪ host | ▪ epidemiology | ▪ epidemic |
| ▪ disease | ▪ herd immunity | ▪ pandemic |
| ▪ normal flora/microbiota | ▪ mutualism | ▪ bacteriolytic |
| ▪ infectious | ▪ parasitism | ▪ bacteriostatic |
| ▪ immunocompromised | ▪ opportunistic pathogens | ▪ bactericidal |
| ▪ predisposing factors | ▪ communicable | ▪ MIC |
| ▪ bacteremia | ▪ non-communicable | ▪ MBC |

1. List and explain the steps in Koch's postulates, and their significance to epidemiology. Why do exceptions to Koch's postulates exist, but not negate its validity?
2. Describe the different ways that the spread of infectious disease may occur.
3. Relate preferred portal of entry and ID₅₀ to the likelihood of infection.
4. List and briefly describe the periods of disease: incubation, prodromal, illness, decline and convalescence.
5. Know how to interpret ID₅₀ and LD₅₀ results.
6. Describe what is meant by invasiveness and the mechanisms and factors that affect invasiveness (adherence, penetration, avoidance of phagocytosis, ability to cause damage).
7. Be able to list enzymes produced by microbes that enhance pathogenicity and virulence as well as describe the effects of these enzymes on the host (*i.e.*, coagulase, hyaluronidase, streptokinase, hemolysins).
8. Differentiate between an endotoxin and an exotoxin as far as source, heat stability, antigenicity, and type of molecule (protein, or polysaccharide/lipid). List and understand how examples from class work.
9. Explain why in some instances it might be wise to prescribe a bacteriocidal antibiotic rather than a bacteriolytic antibiotic. How does this especially apply to Gram negative pathogens?
10. Define the following terms: resistance, susceptibility, nonspecific resistance, specific resistance (immunity).
11. Describe mechanical and chemical factors involved in resistance to disease.
12. Define and describe the mechanism of phagocytosis, describe the process.
13. Describe the process of inflammation and its significance to host resistance.
14. Understand and briefly describe all of the innate defenses in place to protect against disease.
15. Distinguish between the antibody-mediated (humoral) immune system and T cell-mediated immune system. Know the steps and key players in both.
16. Distinguish the four ways that immunity can be acquired.
17. How does herd immunity relate to the containment of infectious disease?
18. Describe and give an example of the various routes of disease transmission.
19. How do host involvement, signs and symptoms relate to the idea of a disease syndrome?
20. Draw and label the structure of an antibody molecule. Include the following components: light chain, heavy chain, variable region, constant region, disulfide bonds, antigen binding site
21. Describe the serological tests discussed in lecture; include direct and indirect versions of each.
22. Explain the antigenicity and cross reactions involved with the human ABO/Rh blood types.
23. Describe the role antibodies play in the hemolytic disease of the newborn (also called erythroblastosis fetalis). Include in your discussion the at-risk population.
24. Explain what is meant by the terms "self" "non-self" and "altered self" in terms of the functions of the immune system.
25. Describe the origin, symptoms, modes of transmission, potential treatments, and future of AIDS.
26. Discuss the mode of action of growth factor analogs in general and sulfonilamides and nucleoside analogs specifically.
27. List and explain the effects of antibiotic/drug action on the bacterial cell and the action of penicillin specifically.
28. Describe how MIC and MBC are calculated. Know which that each of the tests discussed in lecture will tell you.
29. Discuss the major modes of drug/antibiotic resistance (this question refers specifically to metabolic changes in the bacterial cell which cause resistance, NOT how antibiotics are misused). How specifically does the early termination of antibiotic therapy lead to drug resistance?
30. Understand the difference between congenital and acquired immune diseases/defects. How do microorganisms play a role in each of these?
31. How are indirect and direct ELISA, PCR and FACS used to diagnose and track HIV infection?
32. HIV does not just attack helper T cells. If viruses are specific to their host cell type, how is this possible? What other cells does HIV attack?
33. How is HIV transmitted? Describe the progression of the disease in terms of viral load and T cells.