

**Study Guide**  
**MICROBIAL DIVERSITY**  
**Brock Ch. 21**

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With this chapter, we bring together several of the themes we've touched on in class – and highlight several of the ways in which this class interfaces with others you may take/may have taken. We use humans as our model 'host' organism in this chapter to examine the diversity of microbes – beneficial and not so – that inhabit us.

1. Define these terms:

Virulence

Pathogen

Parasite

2. True or false: the host-pathogen interaction is a consistent, static, and unchanging interaction.
3. True or false: the majority of microorganisms that occur on and in the human body are benign.
4. Define, and distinguish between, *infection* and *disease*. Are these synonyms? Why or why not?
  
5. True or false: microorganisms are typically associated with regions of the body that are exposed to the environment (e.g., digestive tract, respiratory tract, etc.).
6. True or false: in a healthy person, microbes are common in the organs and blood.
7. Provide at least two reasons for which the mucous membranes of animals are frequently the site of infection by microorganisms.
  
8. About how much surface area is represented by the skin of the average human adult?
9. The majority of microorganisms that occur on skin are found in association with \_\_\_\_\_.
10. True or false: underarm secretions from human adults are odorless until inoculated with bacteria.

11. The normal flora of microbes on human skin may be transient or resident. Distinguish between these two terms, and provide an example (along with the domain and phylum) for each.
12. True or false: the majority of human skin represents a dry, acidic environment.
13. The \_\_\_\_\_ contains one of the more complex and heterogeneous microbial habitats in humans.
14. What developmental stage in human growth is associated with a sudden increase in anaerobic microbes in the oral cavity?
15. True or false: cavities (dental caries) represent the effects of an infectious disease caused by microbes.
16. Describe the interaction between *Streptococcus mutans* and sucrose. Why do children in the US differ in the frequency of dental caries vs. those from a developing country such as Tanzania?
17. Bacteria make up about what percentage of the weight of human feces?
18. True or false: the presence of normal, nonpathogenic microorganisms in the human respiratory tract and urogenital tract are important for organ function.
19. What is LD<sub>50</sub>?
20. What is attenuation? How do pathogens become attenuated? Why is attenuation a problem, and what is a benefit of it?
21. Compare and contrast toxicity and invasiveness, illustrating each with an example (genus, species, domain, phylum).

22. I will not test you on the mechanisms of toxicity/etc., but do suggest that you read these sections – they are interesting and compelling!
- 23.
24. Use table 21.5 to compare and contrast endo- and exotoxins. Make sure that you can fill in such a table, including an example of an organism (domain, phylum, genus, species) that produces endo- or exotoxins.
25. Non-specific physical, anatomical, and chemical barriers prevent colonization of human hosts by most pathogens. List an example of each kind of barrier.
26. What is a 'compromised host'?
27. Inflammation and fever are nonspecific responses to noxious stimuli such as pathogens. What is the function of these responses?