Independent Study Guide- Host-Microbe Interactions (Chapter 17)

I. The Normal Microbiota (aka Normal Flora) (17.2)
   a. The protective role of the normal microbiota - *Clostridium difficile* example
   b. The dynamic nature of the normal microbiota

II. Establishing the Cause of an infectious Disease – Koch’s Postulates

III. Pathogenic Strategies (intro to section on Mechanisms of Pathogenesis - pg. 397)
   a. Production of toxins that are then ingested
   b. Colonization of surface of the host, followed by toxin production
   c. Invasion of host tissues
   d. Invasion of host tissues followed by toxin production

IV. Establishment of infection (section 17.5)
   a. Adherence
      i. adhesions (figure 17.4)
         1. pili (fimbriae)
   b. Colonization
      i. Compete with normal microbiota
      ii. Obtain iron
         1. Siderophores
      iii. Avoid IgA
         1. Shed antigen
         2. (IgA protease)
         3. antigenic variation
   c. Delivery of effector molecules
      i. Type III secretion systems (figure 17.5)

V. Invasion – Breaching the anatomical barriers (section 17.6)
   a. Penetration of skin
   b. Penetration of mucous membranes
      i. Directed uptake by an epithelial cell (figure 17.6)
      ii. Exploitation of antigen-sampling processes
VI. Avoiding the host defenses (section 17.7)
   a. Hide within a host cell
   b. Avoid killing by complement proteins

VII. Avoid destruction by phagocytes (figure 17.10)
   a. Prevent encounters
   b. Avoid recognition
   c. Survive within the phagocyte

VIII. Damage to the host (section 17.8)
   a. Exotoxins – toxic proteins produced by bacteria; often described according to their activity
      i. neurotoxin, enterotoxin, cytotoxin
   b. Endotoxin
   c. Example of exotoxin-producing bacteria (table 17.1)
      i. Clostridium botulinum (neurotoxin) (p. 657 - 658)

IX. Study Questions
1. Distinguish between colonization and infection.
2. Give two examples of bacteria that cause disease by producing toxins that are then ingested.
3. What is the function of a siderophore?
4. Describe the mechanisms bacteria use to avoid IgA.
5. Describe functions of type III secretions systems.
6. Describe two mechanisms by which bacteria can breach mucous membranes.
7. What advantages does an intracellular bacterium have?
8. Describe three mechanisms of avoiding phagocytosis.
9. How are endotoxins different from exotoxins?