Chapter 15 – Microbial mechanisms of pathogenicity lecture outline

Portals of entry
Numbers of invading microbes
Adherence
  Adhesins and receptors
  Biofilms
How bacterial pathogens penetrate host defenses
  Capsules
  Cell wall components
  Enzymes
  Antigenic variation
  Penetration into the host cell cytoskeleton
How bacterial pathogens damage host cells
  Siderophores
  Direct damage
  Production of toxins
    Exotoxins vs. endotoxins
Pathogenic properties of viruses
Pathogenic properties of fungi and protozoa
Portals of exit

Objective questions
1. What are some common portals of entry that microorganisms use to gain access to the human body?
2. Differentiate between ID_{50} and LD_{50}.
3. What are adhesins made of? What is the function of adhesins? Where are they located on a pathogen? What are receptors made of? Where are they located?
4. What are biofilms? How do they form? Where do they form?
5. How does adherence of a pathogen to a target cell translate to entry of the pathogen into the host cell?
6. What are some different ways that bacterial pathogens are able to penetrate host defenses?
7. Distinguish between the functions of coagulases, bacterial kinases, hyaluronidase, collagenase, and IgA proteases. How can these enzymes help a pathogen penetrate host defenses?
8. What is the function of invasins?
9. What is a siderophore? How is iron used by microbes?
10. Describe, in detail, how bacterial pathogens can damage host cells.
11. Define “toxin” vocabulary.
12. Describe, in detail, the structure of endotoxins and exotoxins and the mode of action for each.
13. What are antitoxins and toxoids? What is the relationship between toxoids and vaccination?
14. Describe the structure and function of A-B toxins, membrane-disrupting toxins, and superantigens. Are these endotoxins or exotoxins?
15. Are endotoxins and exotoxins both produced by gram (+) and gram (-) cells?
16. Where are the genes for most exotoxins found?
17. Identify exotoxins based on the type of host cell that the toxins attack.
18. What are leukocidins? Hemolysins? Streptolysins?
19. What are genotoxins?
20. What is the difference between shock and septic shock?
21. Describe the process by which endotoxins are believed to cause fever. How do aspirin and acetaminophen help reduce fever?
22. Describe the Limulus amebocyte lysate assay. What is this procedure used for?
23. Know the info in table 15.3 in the text.
24. What is the role of plasmids and lysogeny in pathogenicity?
25. What are some viral mechanisms for evading host defenses?
27. Identify pathogenic properties of fungi and protozoa.
28. What are portals of exit? Are they the same as portals of entry?