**Exam 6 Study Guide**

Please note, this is a highlight of the most important aspects of this unit and reminders of commonly missed concepts. Please do not study only the material on this sheet. The PowerPoints, audio clips, discussion forums and videos are the online lecture components and have the material required for this exam. After learning this unit, you should be able to:

**Chapter 15 – Mechanisms of Pathogenicity**

* Define Pathogenicity and Virulence
* Describe portals of entry for pathogens into a human host
* Define infectious dose and lethal dose and which relates to potency and which to virulence. Define virulence and potency
* Describe adherence and adhesins and discuss their role in pathogenicity
* Review biofilms
* Discuss and describe the bacterial capsule and function of the cell wall components as they relate to defeating host defenses
* Discuss the function of the enzymes: coagulase, kinase, and collagenase as they relate to defeating host defenses
* Discuss antigenic variation
* Define invasins
* Define siderophores and discuss how bacterial cells damage host cells directly
* Define the following terms: toxin, toxigenicity, toxemia, shock and septic shock
* Understand the following regarding exotoxins:
  + How they function and produce the signs and symptoms of disease
  + Define antitoxin and toxoid
  + Polypeptide parts of A-B toxin
  + Discuss membrane-disrupting toxins and super antigens
  + Understand whether most are Gram negative or positive
  + That they are by-products of the growing cell
* Understand the following regarding endotoxins:
  + Know their structure and function
  + Review Lipid A
  + Discuss the pyrogenic response
  + Know whether most are Gram negative or positive
  + Know they are located in the outer membrane of the bacterial cell
* Know what these fungal toxins grow on: ergot toxin, aflatoxin, mycotoxin
* Discuss portals of exit

**Chapter 17 – Innate Immunity**

* Discuss the advantages and disadvantages of fever in a human host
* Define the following terms: Susceptibility, Immunity, Innate immunity and adaptive immunity
* Discuss the first line of defense versus the second line of defense and know examples of each
* Define the following terms: epidermis, keratin, mucous membranes, mucus, ciliary escalator, lacrimal apparatus, saliva, urine and vaginal secretions as they relate to innate immunity
* Discuss examples of chemical defenses in human hosts
* Discuss how normal microbiota
* Know in order from most to least the five leukocytes in a healthy person’s differential white cell count: “Never Let Monkeys Eat Bananas”
* Briefly describe the purpose of the lymphatic system and how closely related it is to the blood vessels
* Describe the process of phagocytosis and the three cell types that perform this process
* Describe the mechanisms microbes possess for evading phagocytosis and provide examples of such microorganisms
* Describe the process of inflammation and list the four cardinal signs of inflammation
* Define diapedesis (slide 24)
* Which part of the brain regulates body temperature (especially in fever)
* Briefly discuss the multiple outcomes of complement activation
* Discuss interferons as they function in inhibiting viral replication
* Define the following terms: Transferrins and Antimicrobial peptides

**Chapter 18 – Adaptive Immunity**

* Define Innate versus Adaptive Immunity
* Define, compare and contrast humoral versus cellular immunity
* Know where in the human body B and T cells mature
* Associate B and T cells respectively with humoral or cellular immunity
* Define the following terms: Antigen. Epitopes and hapten
* Know the following associated facts related to each of the immunoglobulins:
  + IgG – 80% of serum antibodies, can cross placenta (protects fetus/infant), enhances phagocytosis and neutralizes toxins
  + IgM – Agglutinates; first antibody produced in response to an infection
  + IgA – Found in mucus secretions
  + IgD – Initiates immune response in B cells
  + IgE – Allergic reactions
* Discuss the activation of B cells
* Briefly describe the five protective mechanisms of binding antibodies to antigens
* Understand that antibodies mostly identify foreign organisms and improve the ability of other host defenses to fight the infection. Antibodies themselves do not usually destroy microbes alone
* Understand that many types of T cells exist and that each has a specific function. You need not know the function of each specifically
* Discuss the function of T Regulatory cells
* Identify and describe Antigen-Presenting cells
* Discuss the purpose of natural killer cells
* Define cytokine storm
* Define antibody titer and primary and secondary responses
* Discuss why the secondary response occurs faster than the primary response
* Define the four types of adaptive immunity and provide an example of each
* Define the following terms: serology, antiserum, globulins, Immunoglobulins, Gamma globulin