

Chapter 15 Cellular Mediated immunity

1. Define immunity providing examples of each (12 pts)

- a. antigen; b. antigenic determinant; c. haptens; d. antibody;
- e. What is immunocompetence?
- f. Which cells are most important in the development of immunocompetence?

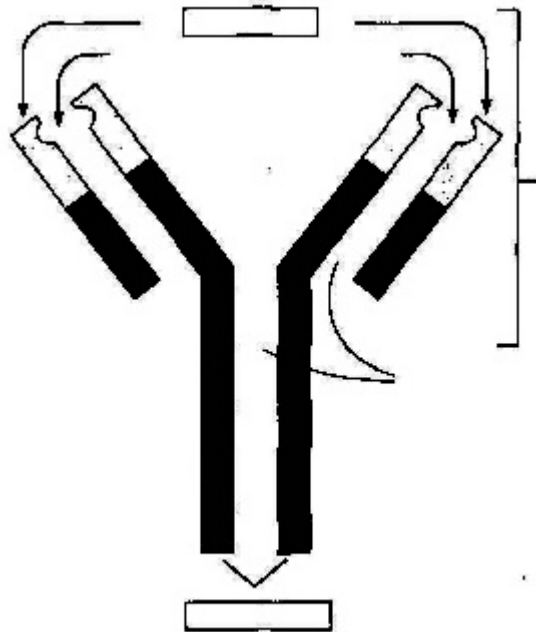
2. Contrast the terms in the following pairs: (14 pts)

- a. innate and acquired immunity
- b. humoral and cell-mediated immunity
- c. active and passive immunity
- d. TH_1 and TH_2 cells
- e. natural and artificial immunity
- f. T-dependent and T-independent antigens
- g. CD_4 and CD_8

3. Classify the following examples of immunity as naturally acquired active immunity, naturally acquired passive immunity, artificially acquired active immunity, or artificially acquired passive immunity: (8 pts)

- a. Immunity following the injection of diphtheria toxoid
- b. Immunity following an infection
- c. A newborn's immunity to yellow fever
- d. Immunity following an injection of anti-bacterial meningitis serum

4. Label the figure shown at the right,
Indicating the location of disulfide
Bonds, heavy chains, light chains,
Variable regions, constant regions,
The antigen-binding site, and Fc region.



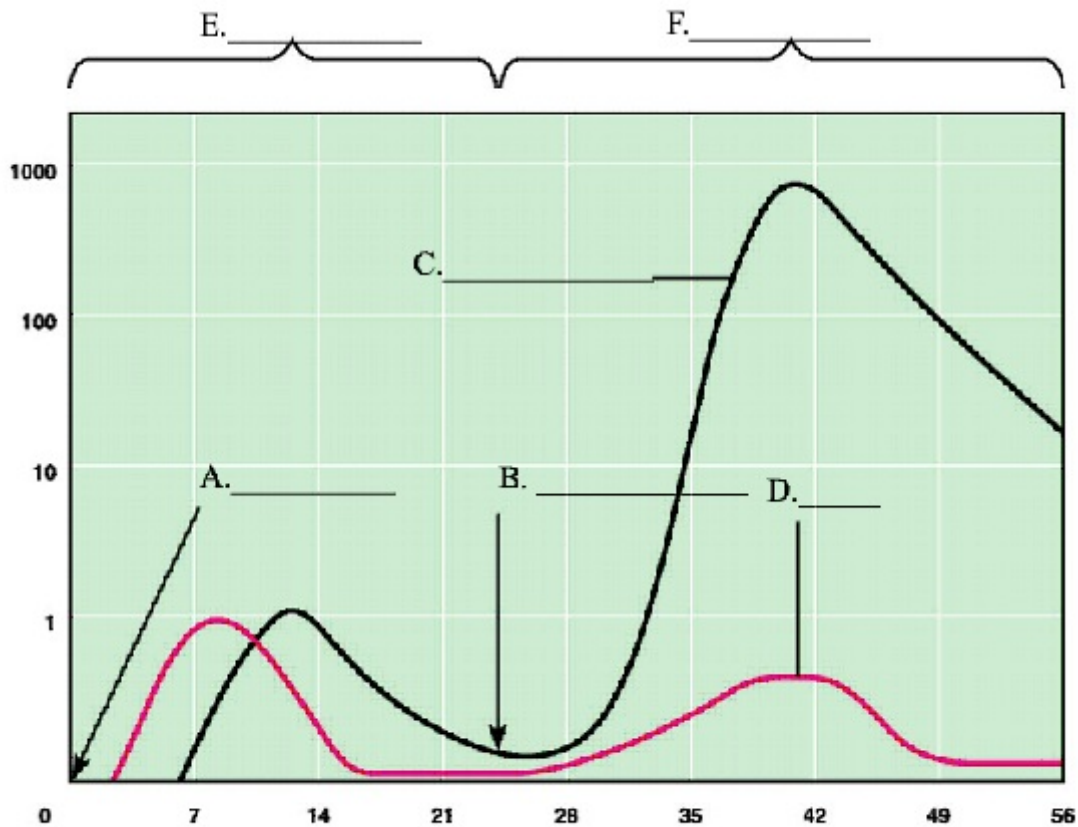
5. List and differentiate between 5 different classes of antibody

Antibody Class	Description	Percentage in Blood Serum	Longevity (Half Life)

6. List and describe the six (6) protective mechanism of binding antibodies to antigens (18 pts)

Type of Protective Mechanics	Description

7. Discuss the clonal selection theory mechanism. (4 pts)



8. a. Provide the “X” and “Y” axis labels

b. In the graph above, what is occurring at time “A”, time “B” ? At time B, the host was given a booster dose.

c. Explain the meaning of the areas of the curve marked “C” and “D”.

d. Identify in the graph the greatest response time of “C”(12 pts)

9. What are antigen presenting cells (APC) and how do they present antigens to the T_H or T_S cells (4 pts)

10. If an APC present an antigen to a T-helper cell, how does the APC activate the T cell? How does the T cell then activate a B cell?

11. How do B cells present antigens to T cell? (4 pts)

12. What signals do B cells require to activate? (2 pts)

13. Where do B cell mature in the human body? Where do T cells mature? (4 pts)
14. Where do B and T cell go after maturation? (2pts)
15. What are natural killer (NK) or cytotoxic killer (Tc) cells?
- a. What are their functions? (6 pts)
16. A specialized group of receptors are Major Histo Compatibility (MHC) antigens.
- a. What are the two types of MHC? (2 pts)
- b. Which cells express each type of MHC (4 pts)
15. How would each of the following prevent infection? (4 pts)
- a. antibodies against *Neisseria gonorrhoeae* fimbriae
- b. antibodies against host cell mannose
16. Explain why a person who recovers from a disease can attend others with the disease without fear of contracting the disease. (4 pts)
17. Pooled human immune serum globulin is sometimes administered to a patient after exposure to hepatitis A. What is human immune serum globulin? What type of immunity might this confer on the patient? (4 pts)
18. What is cellular apoptosis and how does the HIV virus effect apoptosis? (4 pts)
19. Fill in the table

Activation Event	B cells	T cells
Differentiate (to what?)		
Produce proteins (what proteins?)		
Clonal expansion (yes or no)		

20. Place an X in all the cells that match the listed characteristics

Trait	T_{H1}	T_{H2}	T_c or NK cells
Recognizes MCH II			
Has CD ₄			
Has CD ₈			
Recognize MHC I			
Regulates immune reactions			
Produces antibody			
Provides B-cell and T-cell help			
Produces perforins			
Causes late allergies			
Destroys virally infected cells			
Reduced in HIV/AIDS patients			

21. Fill in the table with **X** as appropriate

Attribute	T-cell Receptor	Antibody	Both
Antigen Binding Sites			
Variable and constant regions			
Light or Heavy Chains			
Formed by Genetic Modification			
Secreted			
Binds MHC and Antigen			
Found on B cells			
Recognizes free Antigen			
Recognizes antigen Bound to MHC			
Disulfide Bonds			