



Academy Of Health Sciences, Lodhran

Immunity

1. Define immunity and immune system.

2. Differentiate the two main wings of immune system?

Non-specific/Innate	
Anatomical barriers	
Physiological barriers	
Cellular barriers	
Chemical barriers	
Specific/Acquired	
Humoral immunity/B-cells (HI)	Cell mediated immunity/T-cells (CMI)
Memory cells	Cytotoxic lymphocytes
	Helper cells
Plasma cells	Memory cells
	Suppressor cells

3. Why are B&T lymphocytes different from each other?

4. Draw the structure of antibody and describes the following terms.

- a. Light chain (Kappa and Lambda)
- b. Heavy chain (Gamma, alpha, mue, epsilon delta)
- c. Fragment antigen binding(Fab)
- d. Paratope
- e. Idiotype
- f. Fragment crystalline (Fc)



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- g. Hinge region
- h. Hyper variable region
- i. Constant region
- j. Papain region

5. What are the main types of immunoglobulin/antibodies describe their functions?

These are based on the different types of heavy chains in antibodies.

IgG	
IgA	
IgM	
IgE	
IgD	

6. What are antigens? How our body differentiates between self and non-self?

- a. Antigen is a molecule which can stimulate our immune system. It can be the part of our body or part of microorganisms.
- b. It will be considered as self if it is already registered to our lymphocytes.
 - All the proteins of our body are registered at intrauterine life in the thymus
 - At this time some foreign proteins can be registered as self mistakenly
- c. It will be treated as non-self if it is not registered to our lymphocytes.
 - Some proteins of our own body are not registered and these are considered as non-self like nuclear proteins, eye lense, sperms etc
 - If these proteins come in contact with blood immune system will be stimulated against them.

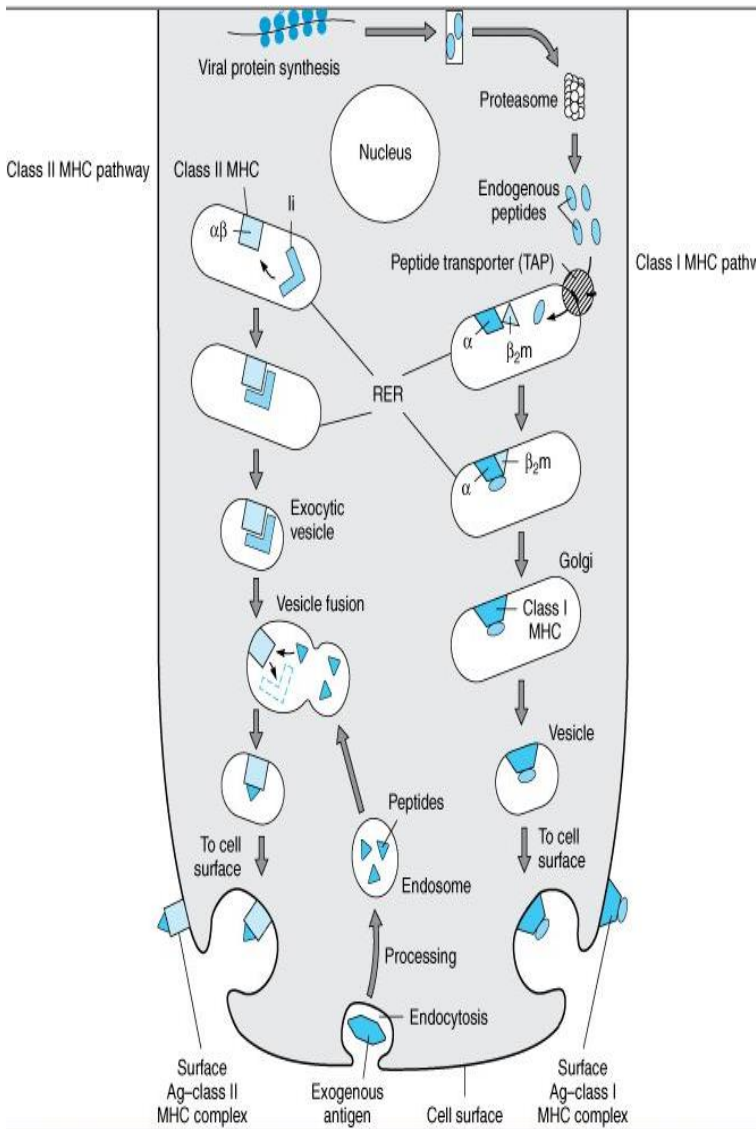
7. What are Major histocompatibility complex proteins and explain their role.

MHCs are the special proteins which are present in cells. These proteins acts as plate in which a cell present antigen to lymphocytes. A lymphocyte first recognize the MHC and then the thing present in it and whatever it is, it is considered as antigen.

- a. MHC-1
 - It is present on every nucleated cell
 - It expresses the proteins/antigens of intracellular microorganisms like viruses and intracellular bacteria
 - It presents to cytotoxic lymphocytes (CTL/CD-8)
- b. MHC-2
 - It is present in immunocompetent cells/ active phagocytes
 - It presents the proteins/antigens of circulating microorganisms to helper cells(CD-4)

8. What is immunization/vaccination?

	Active	Passive
Natural		
Artificial		



1. Describe the events of inflammation

- a. Vasoconstriction
- b. Vasodilation
- c. Transmigration
- d. Chemotaxis
- e. Recognition
- f. Phagocytosis
- g. Phagolysosome formation
- h. Antigen presentation to lymphocytes
- i. Antibodies production from B-cells
- j. Future immunization from that antigen/microorganism

2. Types of antigen antibody reaction

- a. Precipitation
- b. Agglutination
- c. Flocculation
- d. Neutralization

3. What are complement proteins? Describe their pathways.

- a. Classical pathway
- b. Alternate pathway
- c. Lactin pathway

9. What is allergy/hypersensitivity?

	Introduction	Mechanism	Examples
Type-1			
Type-2			
Type-3			
Type-4			



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Table 6-2 Examples of Disorders Caused by Immediate Hypersensitivity

Clinical Syndrome	Clinical and Pathologic Manifestations
Anaphylaxis (may be caused by drugs, bee sting, food)	Fall in blood pressure (shock) cause by vascular dilation; airway obstruction due to laryngeal edema
Bronchial asthma	Airway obstruction caused by bronchial smooth muscle hyperactivity; inflammation and tissue injury caused by late-phase reaction
Allergic rhinitis, sinusitis (hay fever)	Increased mucus secretion; inflammation of upper airways, sinuses
Food allergies	Increased peristalsis due to contraction of intestinal muscles

Table 6-3 Examples of Antibody-Mediated Diseases (Type II Hypersensitivity)

Disease	Target Antigen	Mechanisms of Disease	Clinicopathologic Manifestations
Autoimmune hemolytic anemia	Red cell membrane proteins (Rh blood group antigens, I antigen)	Opsonization and phagocytosis of red cells	Hemolysis, anemia
Autoimmune thrombocytopenic purpura	Platelet membrane proteins (GpIb: IIIa integrin)	Opsonization and phagocytosis of platelets	Bleeding
Pemphigus vulgaris	Proteins in intercellular junctions of epidermal cells (epidermal cadherin)	Antibody-mediated activation of proteases, disruption of intercellular adhesions	Skin vesicles (bullae)
Vasculitis caused by ANCA	Neutrophil granule proteins, presumably released from activated neutrophils	Neutrophil degranulation and inflammation	Vasculitis
Goodpasture syndrome	Noncollagenous protein in basement membranes of kidney glomeruli and lung alveoli	Complement- and Fc receptor-mediated inflammation	Nephritis, lung hemorrhage
Acute rheumatic fever	Streptococcal cell wall antigen; antibody cross-reacts with myocardial antigen	Inflammation, macrophage activation	Myocarditis, arthritis
Myasthenia gravis	Acetylcholine receptor	Antibody inhibits acetylcholine binding, down-modulates receptors	Muscle weakness, paralysis



Table 6-4 Examples of Immune Complex-Mediated Diseases

Disease	Antigen Involved	Clinicopathologic Manifestations
Systemic lupus erythematosus	Nuclear antigens (circulating or "planted" in kidney)	Nephritis, skin lesions, arthritis, others
Poststreptococcal glomerulonephritis	Streptococcal cell wall antigen(s); may be "planted" in glomerular basement membrane	Nephritis
Polyarteritis nodosa	Hepatitis B virus antigens in some cases	Systemic vasculitis
Reactive arthritis	Bacterial antigens (e.g., <i>Yersinia</i>)	Acute arthritis
Serum sickness	Various proteins, e.g., foreign serum protein (horse antithymocyte globulin)	Arthritis, vasculitis, nephritis
Arthus reaction (experimental)	Various foreign proteins	Cutaneous vasculitis

Table 6-5 T Cell-Mediated Diseases

Disease	Specificity of Pathogenic T Cells	Principal Mechanisms of Tissue Injury	Clinicopathologic Manifestations
Rheumatoid arthritis	Collagen? Citruinated self proteins?	Inflammation mediated by T_H17 (and T_H1 ?) cytokines; role of antibodies and immune complexes?	Chronic arthritis with inflammation, destruction of articular cartilage
Multiple sclerosis	Protein antigens in myelin (e.g., myelin basic protein)	Inflammation mediated by T_H1 and T_H17 cytokines, myelin destruction by activated macrophages	Demyelination in CNS with perivascular inflammation; paralysis,
Type 1 diabetes mellitus	Antigens of pancreatic islet β cells (insulin, glutamic acid decarboxylase, others)	T cell-mediated inflammation, destruction of islet cells by CTLs	Insulinitis (chronic inflammation in islets), destruction of β cells; diabetes
Inflammatory bowel disease	Enteric bacteria; self antigens?	Inflammation mediated by T_H1 and T_H17 cytokines	Chronic intestinal inflammation, obstruction