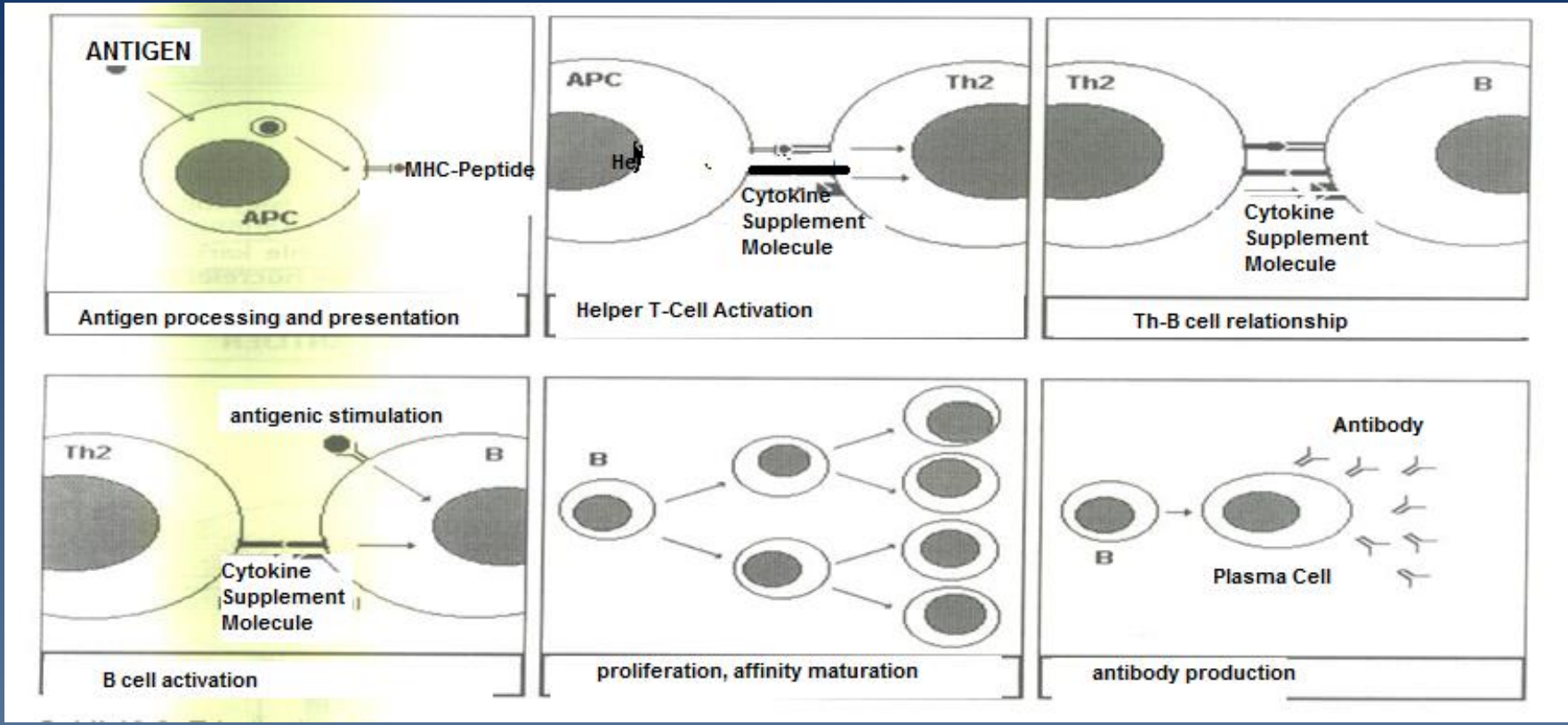
HUMORAL IMMUNITY

Humoral Immunity

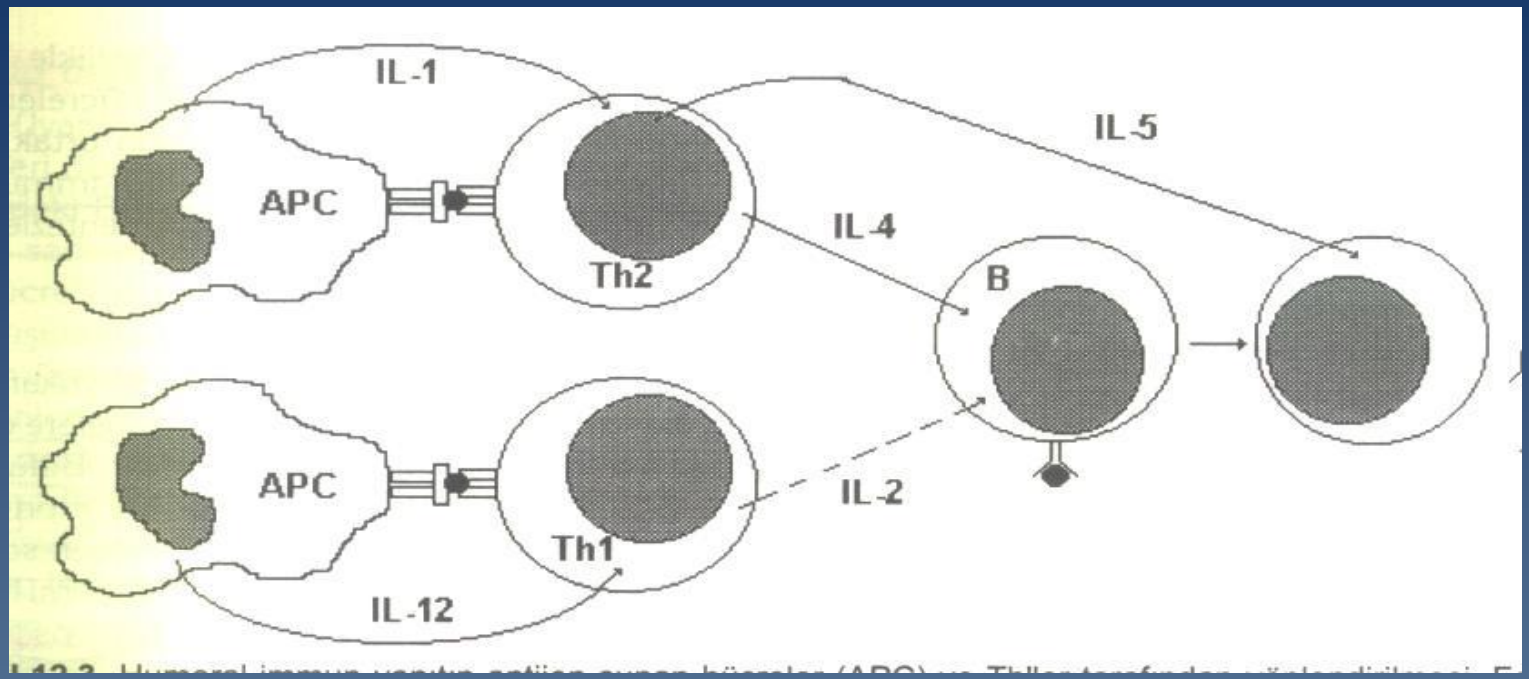
- T-dependent antigens: proteins
- T-independent antigens: non-protein antigens (carbohydrates, etc.)
- Immune response to T-dependent antigens (Th immune response)
- Immune response to T-independent antigens (Immune response without Th help)

Humoral Immunity



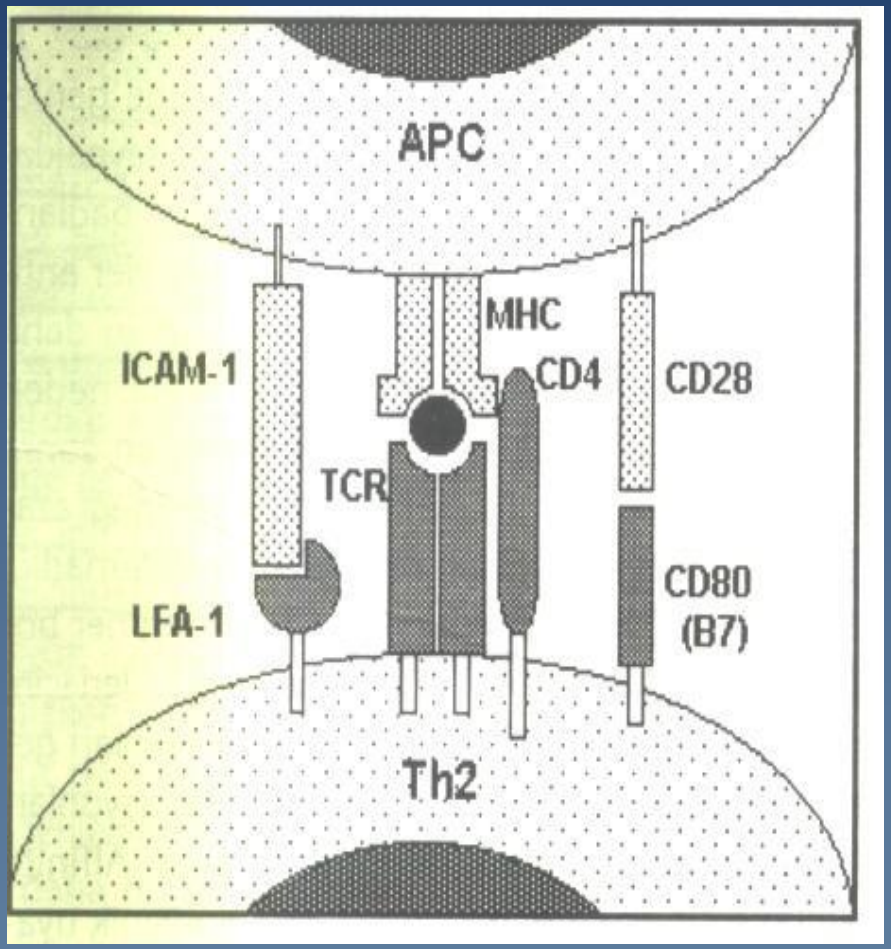
- Antigen processing and presentation
- Helper T-lymphocyte activation
- Relation between T-lymphocyte and B-lymphocyte
- B-lymphocyte activation (proliferation, affinity maturation, isotype change, antibody synthesis

Humoral Immunity



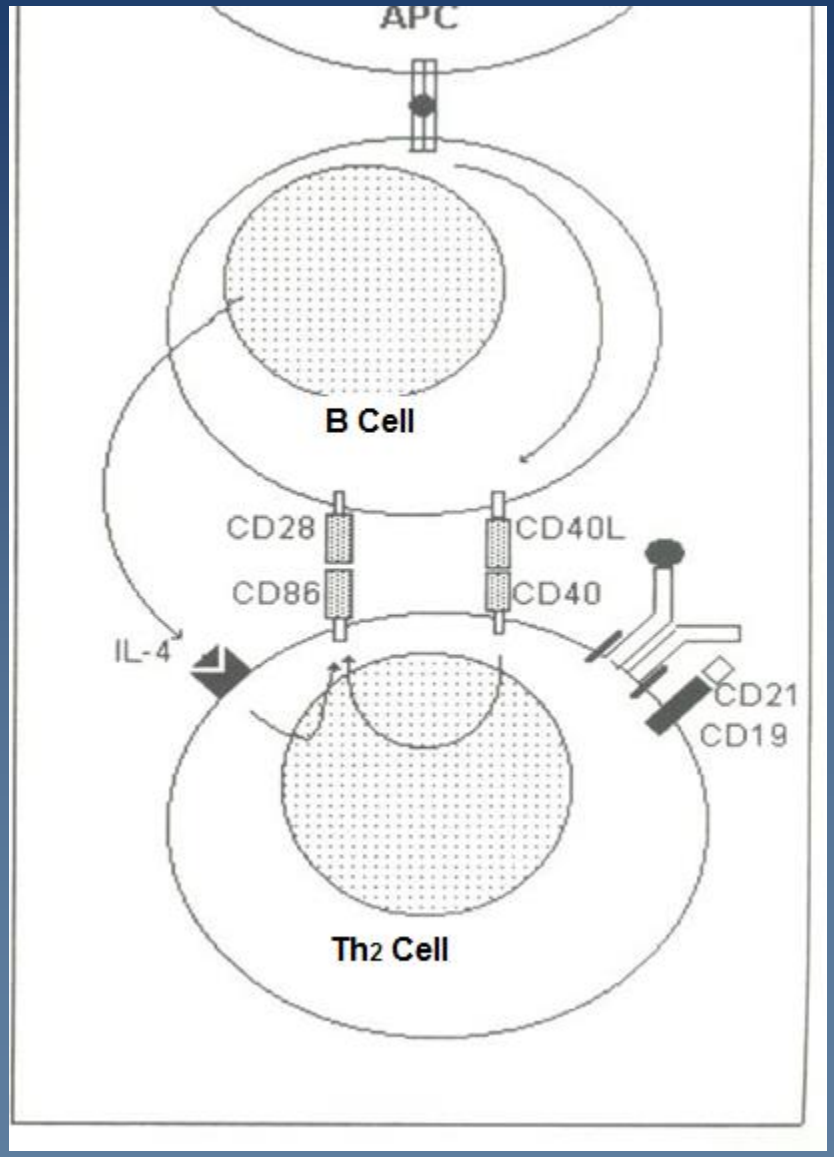
- APC causes the formation of humoral or cellular immunity by presenting the antigens they process in different Helper T-lymphocyte groups

Humoral Immune- Th Stimulation



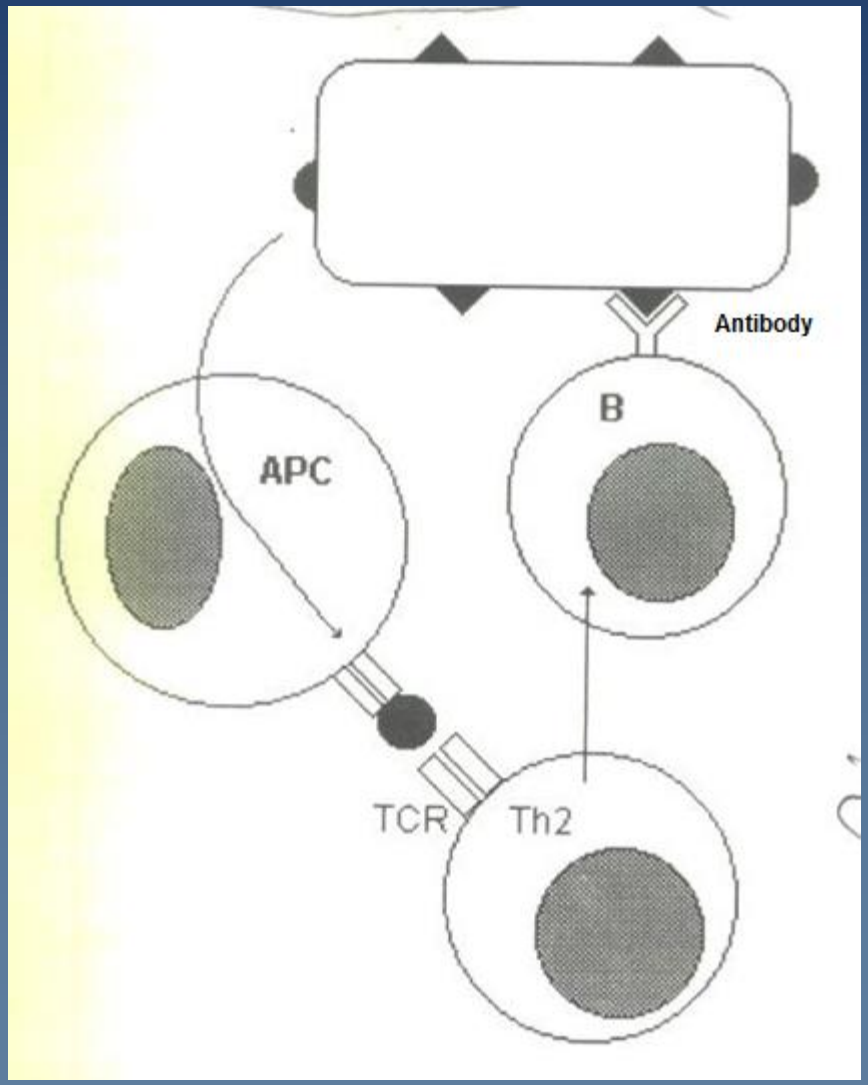
- Importance of MHC class II molecule with TCR connection and additional signal molecules to stimulate Helper T Lymphocytes
- The role of IL-1 synthesized by APC is important !!!!

Humoral Immune-T and B lymphocyte relationship



- Aid of Th is required for B-lymphocyte to receive antigenic stimulation
- Aid of Th occurs with additional molecule and cytokine stimulation

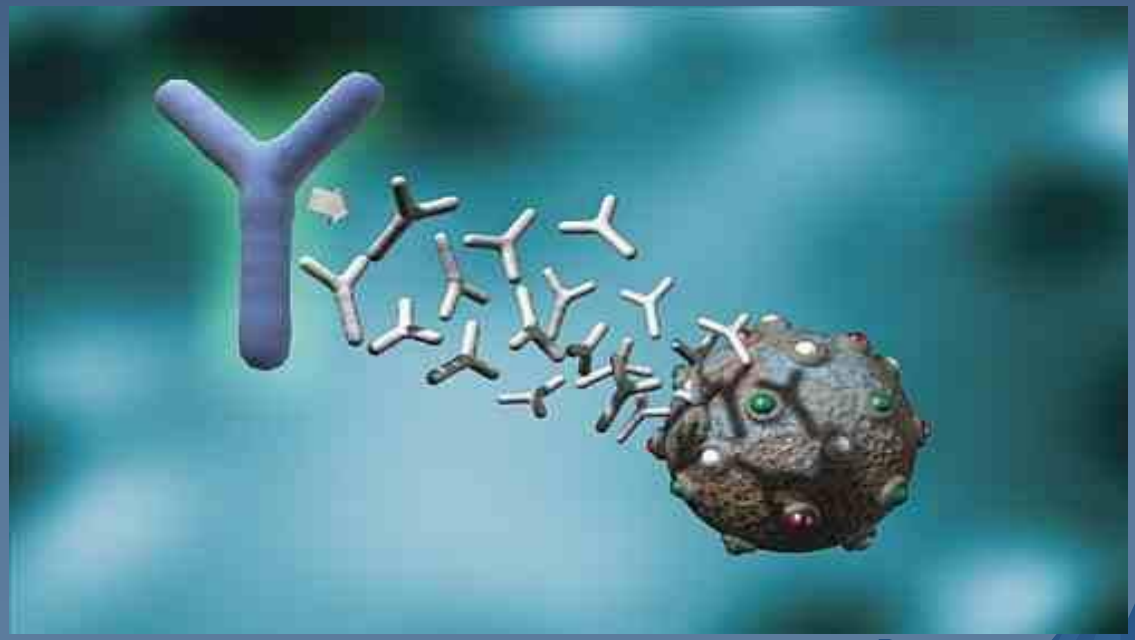
Humoral Immunity



- With the help of Th, antigenic molecule presents with APC in B-lymphocyte stimulation
- Different epitopes of the same antigen can stimulate Th2 and B-lymphocyte

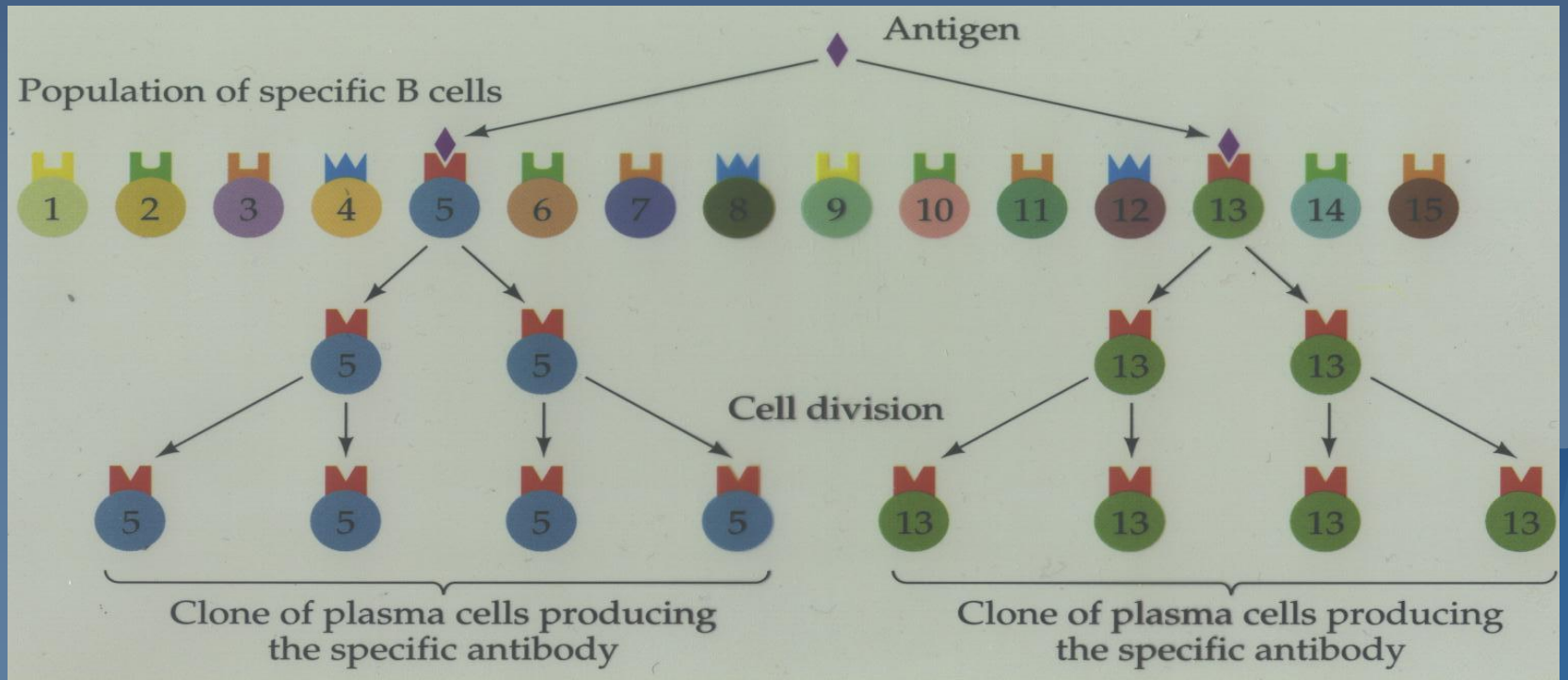
Humoral Immunity

- B-lymphocyte activation:
  B-lymphocyte proliferation → Affinity maturation → Isotype change → Antibody production from plasma cells

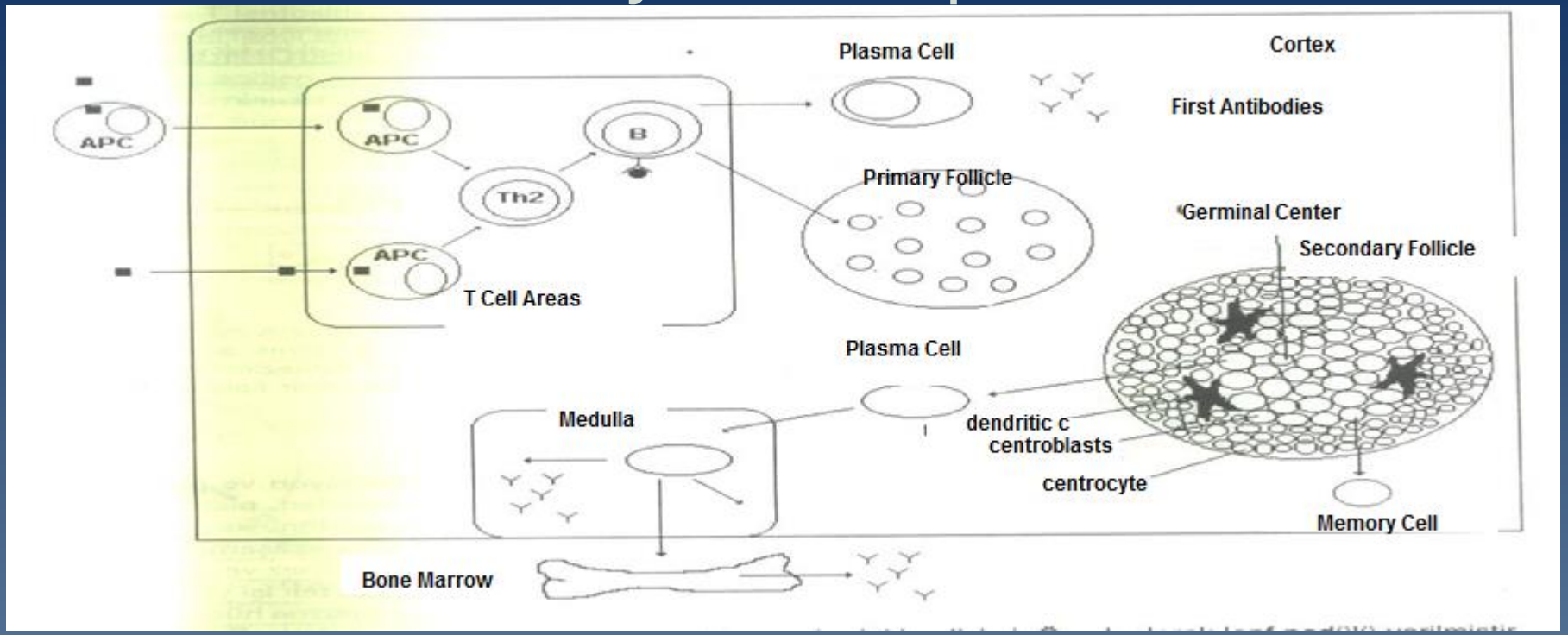


Clonal Selection

- The proliferation of specific lymphocyte clones response to a specific epitope. The response is triggered through specific antigen-binding receptors.



Humoral immunity - development of tissues

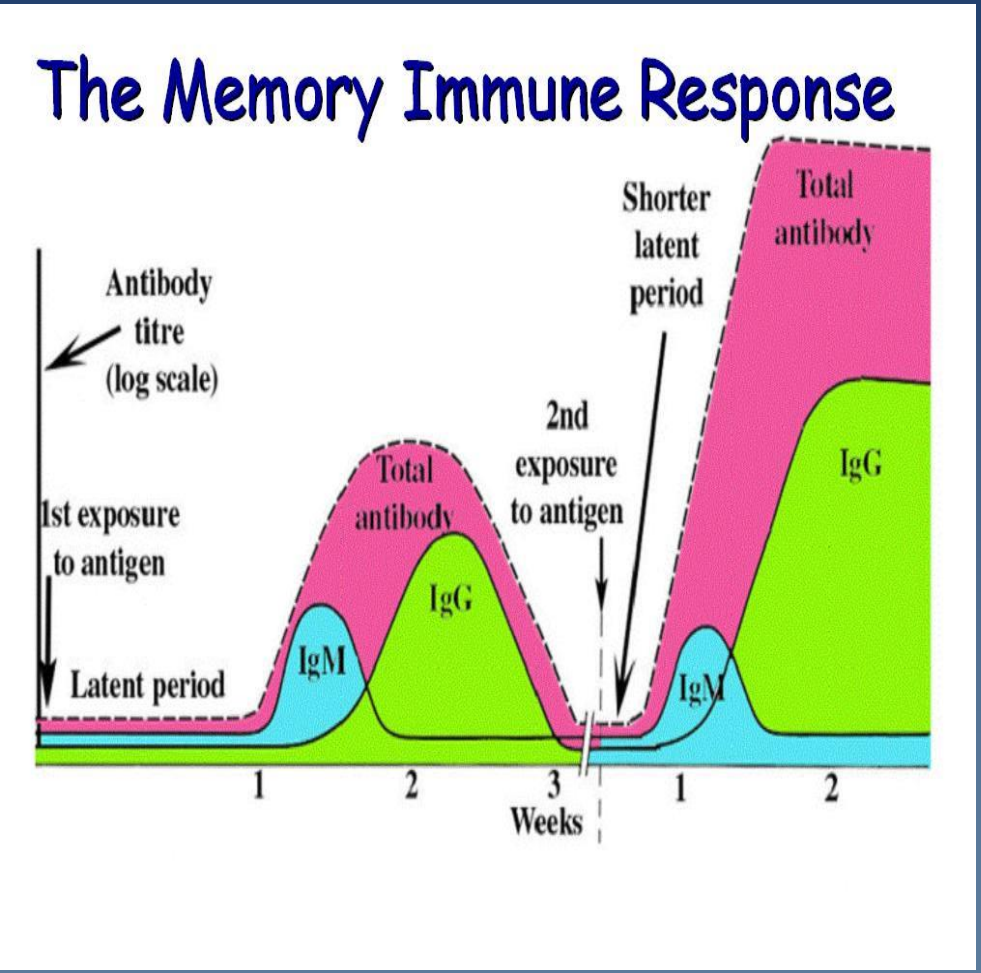


- Secondary lymphoid organs
- Antigen presentation from APCs to Ths
- B-lymphocyte stimulation of Th2s in T cell areas
- B-lymphocyte proliferation-affinity maturation-isotype change in germinal centers
- Memory cell formation at the exit of germinal centers
- Antibody synthesis in medulla

Humoral Immunity (Against T Independent Antigens)

- T-independent antigens are antigens that can stimulate B-lymphocytes without Th help.
- Example: polysaccharide, lipopolysaccharide structures in the cell wall of bacteria
- There is no Th help and no cytokine help in this type of humoral immune response
- Affinity maturation, isotype change and memory B cell (B memory) do not occur in B-lymphocytes

Primary and Secondary Immune Response



- Immunological memory
- Memory cells: undergone isotype change and affinity maturation
- Primary and secondary immune response

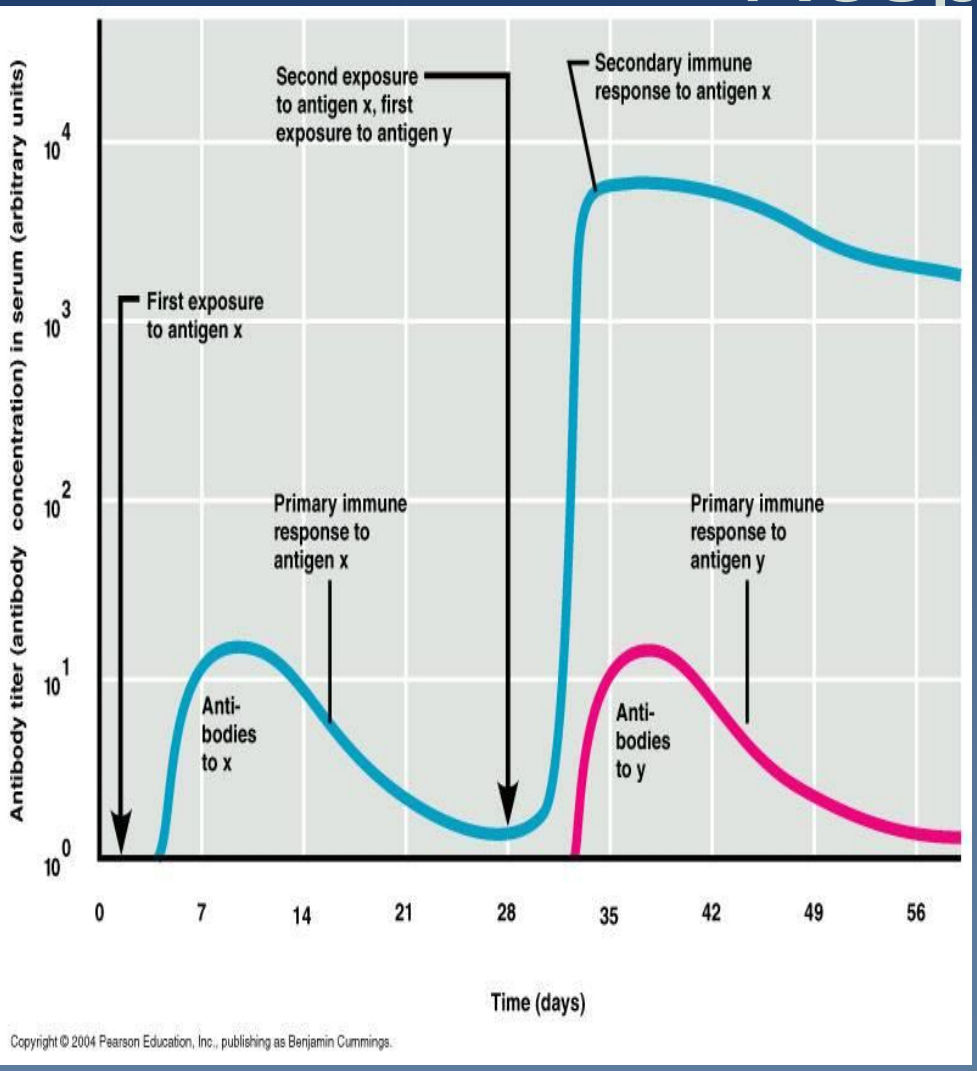
*time

*antibody isotype

*antigen affinity

*antibody production site

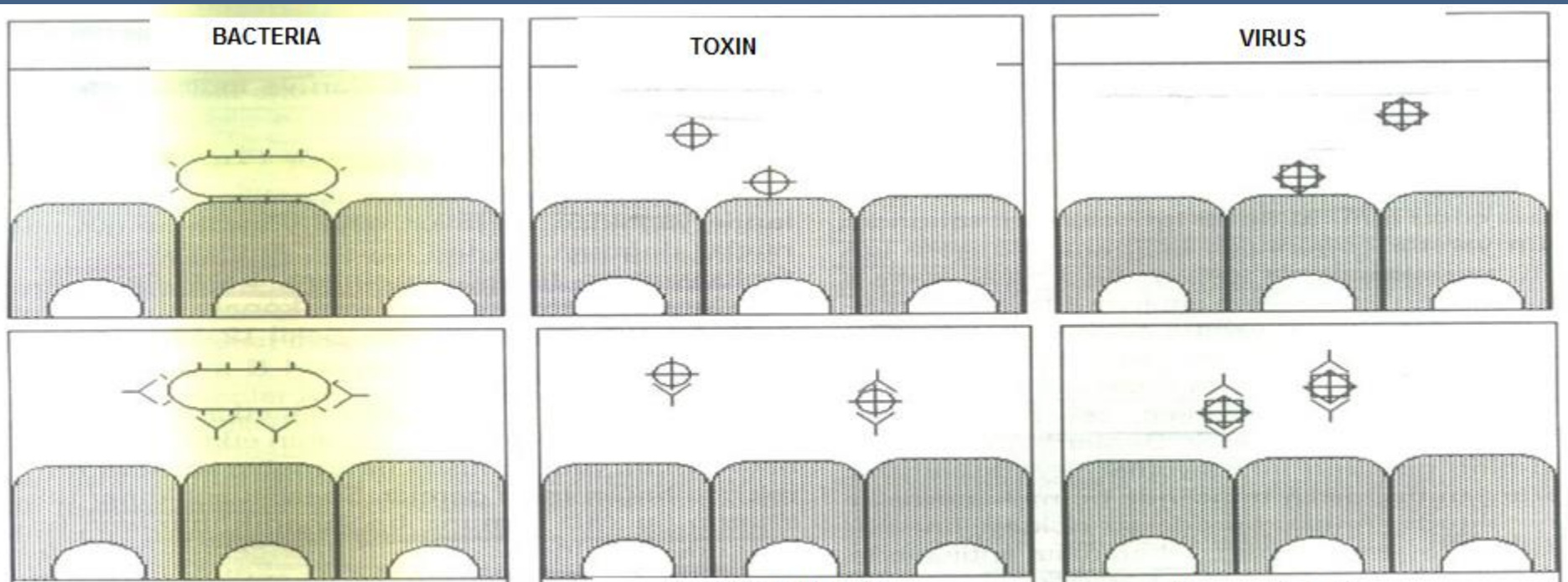
Primary and Secondary Immune Response



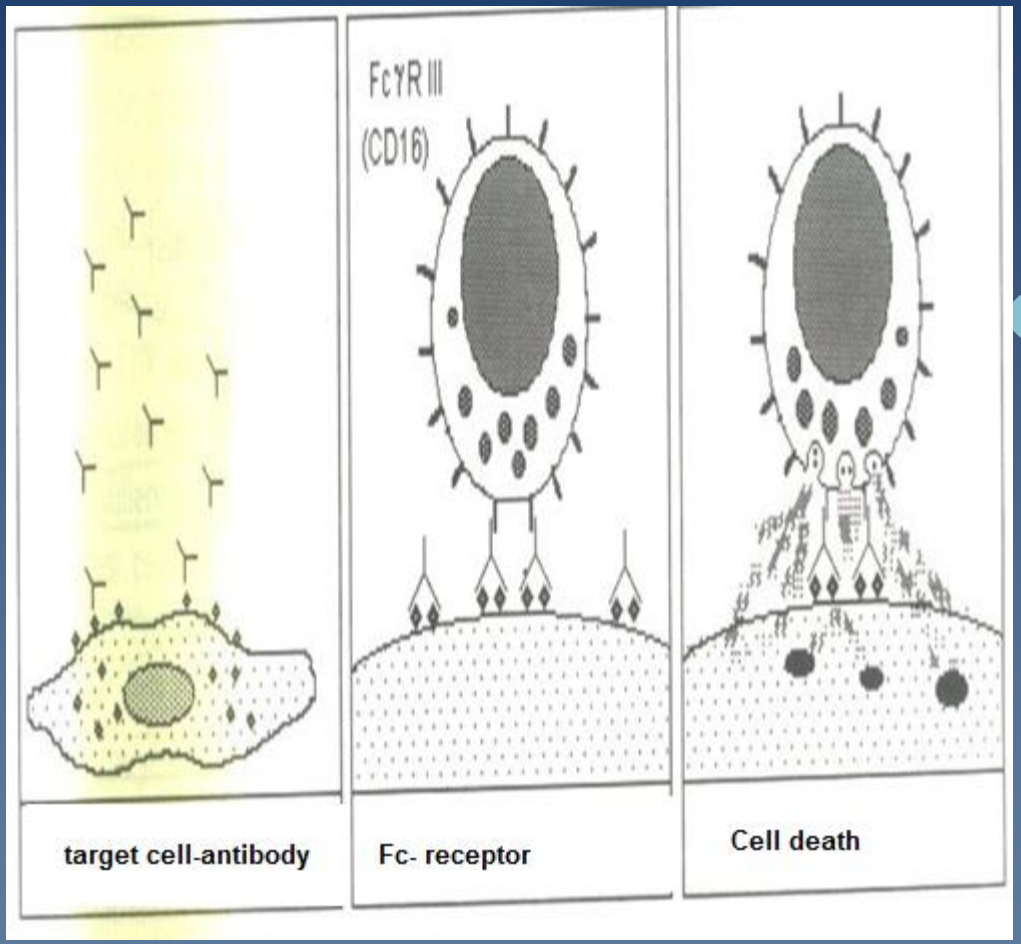
- The difference between primary and secondary immune response explains the importance of vaccine immunity

Functions of Antibodies (Direct Effector Functions)

- Inhibition of bacterial adhesion
- Toxin neutralization
- Virus neutralization

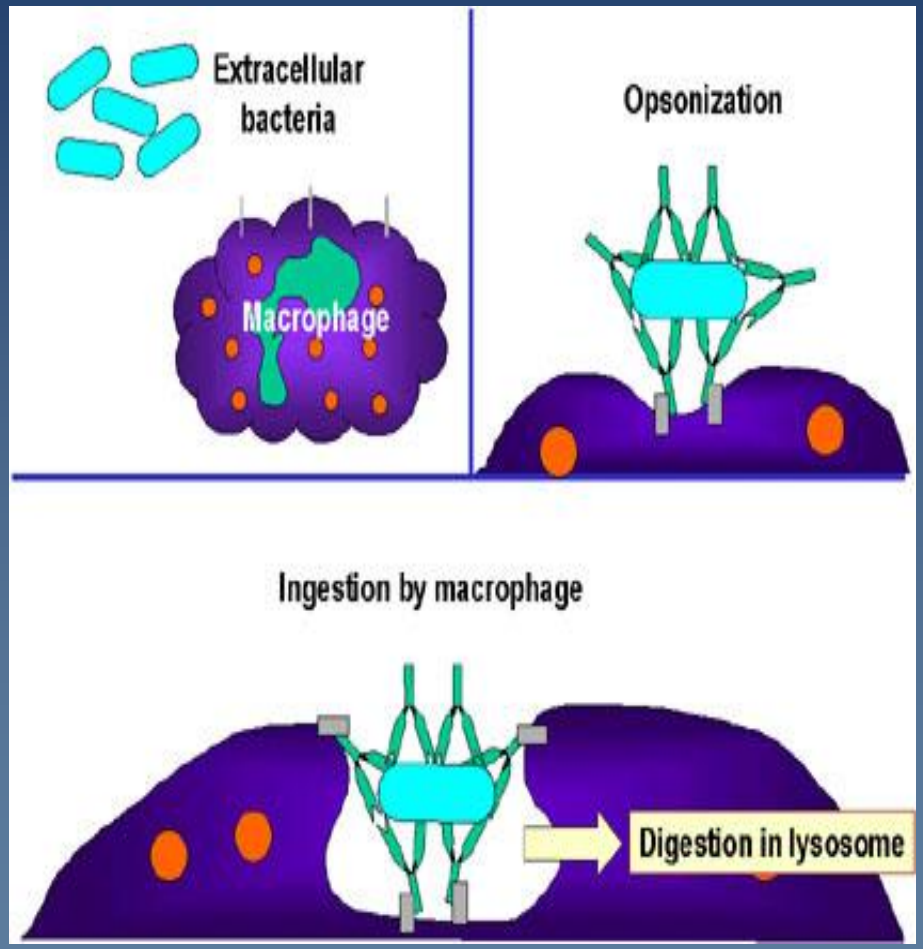


Functions of Antibodies (Indirect Effector Functions)



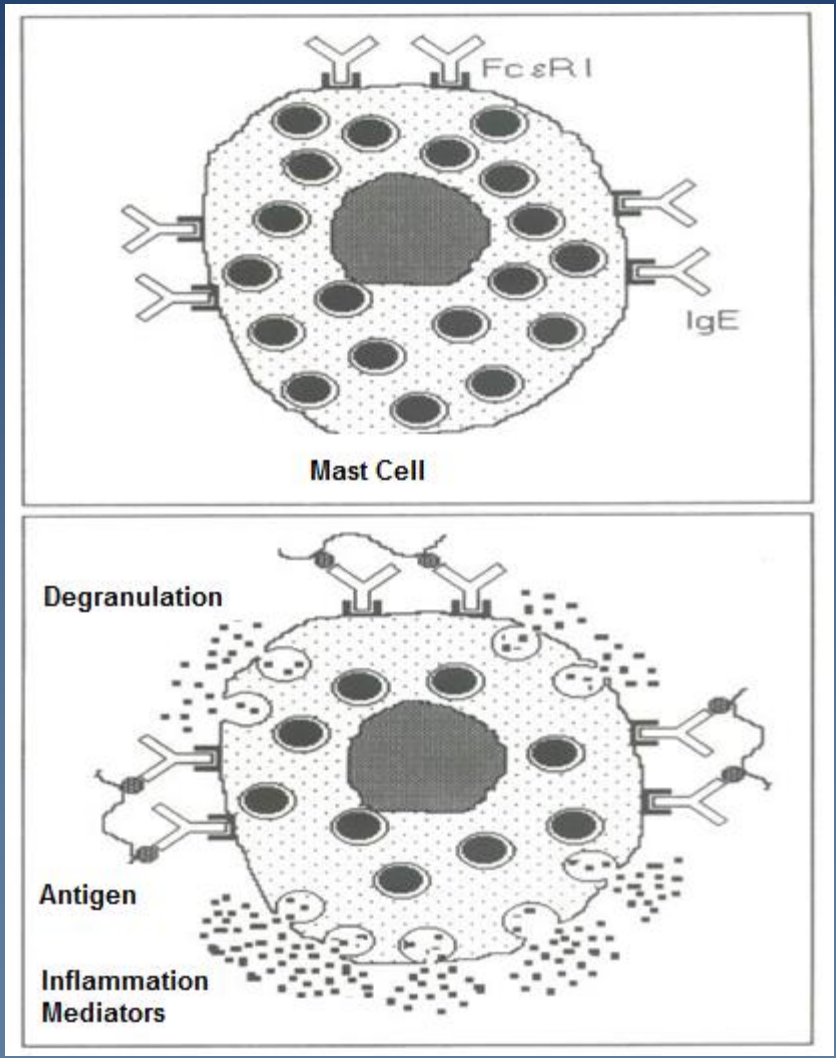
- Antibody-dependent cellular cytotoxicity (ADCC)

Functions of Antibodies (Indirect Effector Functions)



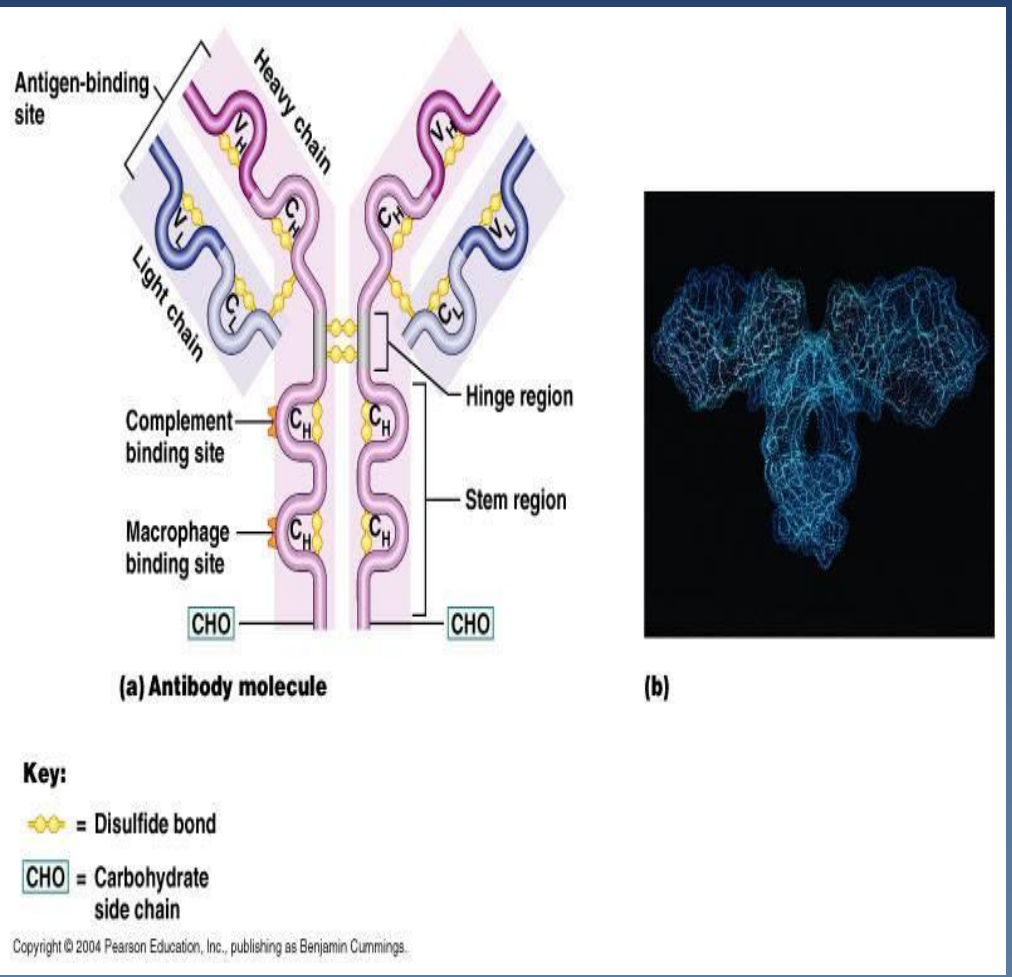
- The opsonization

Functions of Antibodies (Indirect Effector Functions)



- Local inflammatory reaction stimulation

Functions of Antibodies (Indirect Effector Functions)



- Complement Activation