

Immunology.
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 FI7-011

SGD 1

Q No # 8

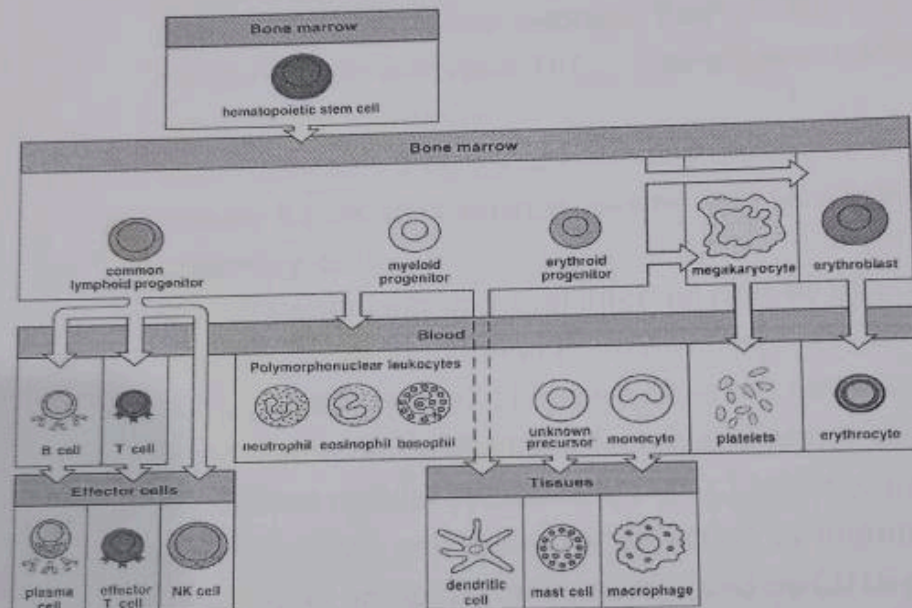


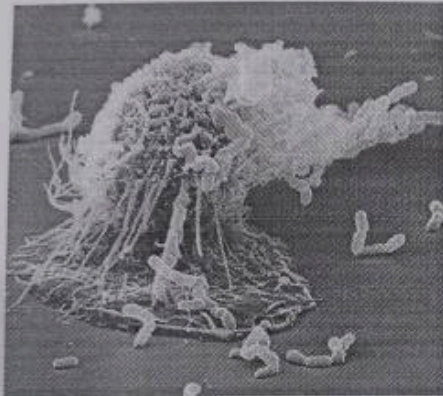
Figure 1-11 The Immune System, 2/e (© Garland Science 2005)

1. Name cells of lymphoid lineage?
2. Name antibody producing cells.
- ✓ 3. What are the functions of CTL?
- ✓ 4. What is the mechanism of action of NK cells? ✓

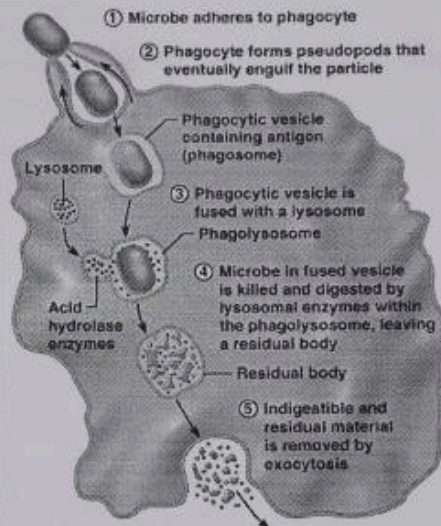
Key 1

1. Lymphocytes, B cell & T cells. And NK cells. T cells are of two types: helper T cells (CD4) and cytotoxic T cell (CD8).
Helper T cells subtypes: Th1.... Activate macrophages and involve in cell mediate immunity.
Th2.... activates B cells and involve in humoral immunity.
2. Mature B cells are known as plasma cells which are antibody producing cells.
3. CTL kill tumor cells and viral infected cells by direct cytotoxicity through the production of granzymes, perforin and granulysin.
4. NK cells is the type of CTL which does not have surface receptors like B and T cells. They kill viral infected and tumor cells through antibody dependent cellular cytotoxicity (ADCC). Infected cells are routinely opsonized with antibodies for detection by immune cells. Antibodies that bind to antigens can be recognised by CD16 receptors expressed on NK cells, resulting in NK activation, release of cytolytic granules and consequent cell apoptosis.

SGD 2



(a)



(b)

- ✓ 1. Name three Antigen presenting cells.
- ✓ 2. What is the mechanism of action of microbe killing by phagocytosis?
3. Name 2 organism which reside in macrophage after phagocytosis.

Key 2

- ✓ 1. Macrophages, B cells, Dendritic cells.
2. Phagolysosome fusion resulting in release of acid hydrolase enzyme from lysosome. ROS(reactive oxygen species) production.
3. Mycobacterium tuberculosis and leishmania prevent phagolysosome fusion, thus prevent degradation.

SGD 3

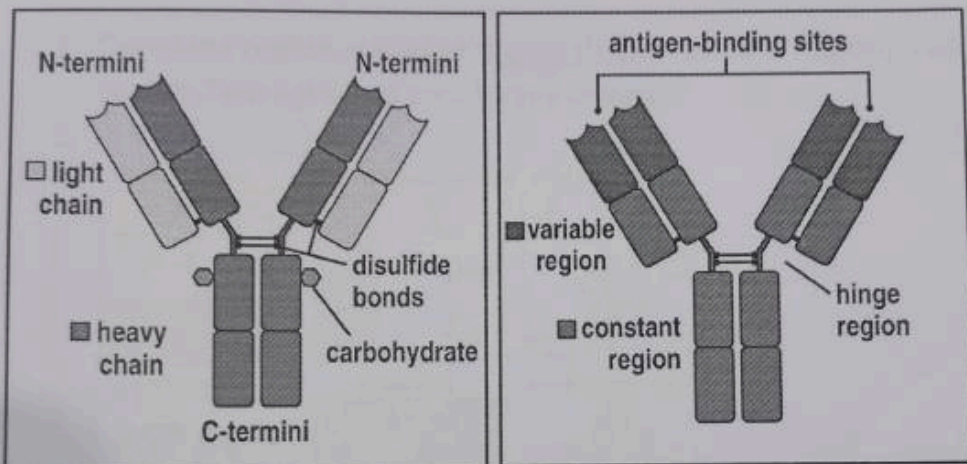


Figure 2-2 The Immune System, 2/e (© Garland Science 2005)

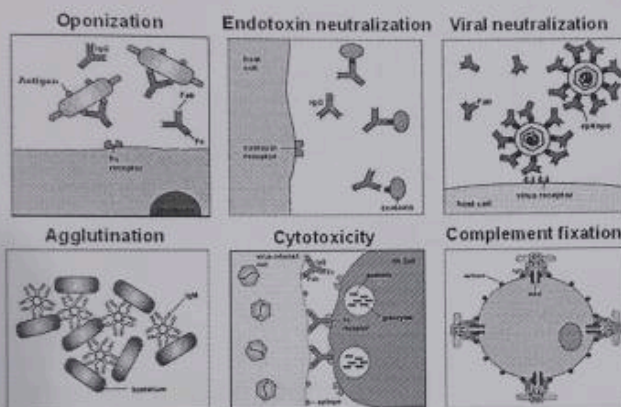
1. What are different parts of antibody?
2. What are functions of antibodies?
3. How antigen bound antibody is bound to macrophage?
4. How antibodies react to different antigens which we encounter throughout life?
5. Which is the most common and least antibody in serum? *IgG, IgM, IgE*

Macrophages have Fc receptor for antibody bound to an antigen resulting in an activation.

Key 3

1. Constant region, variable region (hypervariable region), Fab and Fc region, Two light and two heavy chains.

2.

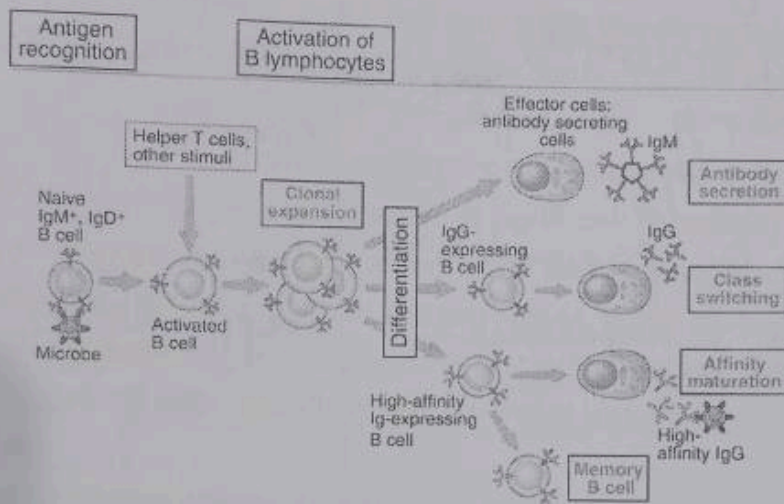


3. Macrophages have Fc receptors for antibody bound to an antigen resulting in activation.

4. Through VDJ gene recombination. Each antibody is only specific for one antigen and through this diversity we produce broad combinations to combat various infections throughout life.

5. IgG&IgE.

SGD 4



1. What is clonal expansion?
2. How B cells class switch?
3. What is the role of memory cells in immunity?

Adaptive immunity

It is a type of immunity that the organism develops during a lifetime. It provides B & T lymphocytes & provides a 3rd line of a defence.

Innate immunity

It is a non-specific defence mechanism that comes into play immediately or within in the hour of an antigen appearance in the body.

Key 4

1. Once specific clone of B and T cell recognise their cognate antigens results in proliferation of specific clones with multiple copies, this is known as clonal expansion.
2. Class switching occurs after activation of a mature B cell via its membrane-bound antibody molecule (or B cell receptor) to generate the different classes of antibody, all with the same variable domains as the original antibody generated in the immature B cell during the process of V(D)J recombination, but possessing distinct constant domains in their heavy chains. B cells also class switch under influence of specific cytokines.
3. Primary infection results in activation of B cells which produce antibody and formation of memory cells. Subsequent infection with the same antigen results in memory cells to proliferate and produce antibodies.