

Cells and organs of immune system.

Organs concerned with immune reactions are called lymphoid organs. They contain lymphoid cells. Lymphoid organ and Lymphoid cells constitute the lymphoid system. Lymphoid organs are of 2 types.

1. Primary lymphoid organs
2. Secondary lymphoid organs

1. Primary lymphoid organs

Primary lymphoid organs are the major site of lymphopoiesis. The lymphoid stem cells proliferate, differentiate, and mature into immune competent cells in the absence of antigenic stimulation. The primary lymphoid organs are large at birth and they atrophy with age. Major primary lymphoid organs are

1. Thymus
2. Bursa of Fabricius
3. Bone marrow

2. Secondary lymphoid organs

Lymphocytes are made functional in the secondary lymphoid organs. Here the cells are exposed to antigens and they produce antibodies. The secondary lymphoid organs are small and poorly developed at birth and they grow progressively with age. The secondary lymphoid organs include

1. Lymph nodes
2. Spleen
3. MALT
 - a. Peyer's patches
 - b. Tonsils

Cells of the immune system are

1. Lymphocytes
 - B lymphocytes
 - T lymphocytes
 - Null cells

Natural killer cells (NK cells)

Killer cells (K cells)

2. Macrophages
3. Eosinophils
4. Basophils
5. Neutrophils
6. Antigen presenting cells
7. Mast cells
8. Platelets

Lymphocytes

Lymphocytes are mononucleate, nongranular leukocytes of lymphoid tissue participating in immunity. They are found in blood, lymph and lymphoid tissue such as spleen, lymph nodes, tonsils, peyer's patches appendix etc. they are spherical or ovoid in shape. They arise from pluripotent haemopoetic stem cells.

B lymphocytes

Lymphocyte that matures in bursa of fabricius or bone marrow and that brings about humoral immunity is called B lymphocytes. The B lymphocytes contain immunoglobulin in their surface.

T. Lymphocytes.

Lymphocytes that matures in thymus and that brings about cell mediated immunity is called T.Lymphocytes . The T Lymphocyte are thymus dependent cells. They nature under the influence of thymic hormone. There are different types of T cells. They are T helper cells (TH cells) T suppresser cells. T cytotoxic cells, and T delayed type hypersesitingly cells.

Plasma cells

These are the end cells of the B- lymphocytes. They secrete immunoglobulins. Plasma cells are rarely seen in the plasma of blood but are found mainly in the secondary lymphoid organs namely lymph node and spleen. They have an eccentrically placed nucleus and the sparse cytoplasm is often gathered on one side.

Null cells

Null cells are lymphocytes with cytotoxic properties. They are neither B cell or T cell. They are intermediate between T and B cells. They form the third population cells (TPC). They form less than 3%.

There are 2 types of null cells namely.

1. Natural killer cell
2. Killer cells.
- 3.

1. Natural killer cells (NK cells)

NK cells are a group of null cells. They form the third population of lymphocytes. The NK cells have 2 or 3 large granules in the cytoplasm. Hence they are also called large granular lymphocytes (LGL). They have a kidney shaped nucleus. They destroy the cancer cells and cells infected with herpes and mumps virus. They do not need antibody for activity They are activated by interferons and interleukin – 2.

2. Killer cells (K cells)

Killer cells are a group of null cells. They form the third population of lymphocytes. They are antibody dependent. These cells can combine with specific antibody when it is in complex with antigen

Macrophages

Macrophages are large mononuclear phagocytic cells derived from monocytes. Macrophages are concentrated in lymph nodes, spleen, bone marrow and liver.

Eosinophils

There are acidophilic leucocytes and are called Eosinophils because eosin an acid dye stains the granules of the cytoplasm of these cells intensely. Granules are rich in hydrolytic enzymes. The nucleus is usually bilobed or ellipsoid.

Basophils

The cytoplasm of these cells containing granules that stain with basic dyes. The basophilic granules contain heparin, histamine, serotonin, platelet activating factor.

Neutrophils

Neutrophils form the major part of the white blood corpuscles. They are motile, short lived cells with multilobed nucleus. Major function of the neutrophil is phagocytosis.

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