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CELLS OF THE IMMUNE SYSTEM

Leukocytes or WBCs are the major cells involved in immune response. All blood and lymph cells are derived from stem cells, which are pluripotent (capacity to develop into many cell type) in nature . these cells are known 55gives rise to RBCs platelets nautrophils, basophils and eosinophils and monocytes. Lymphoid , CD cells gives rise to B cells (B lymphocytes), T cells (T lymphocytes) and natural killer cells. these lymphocytes are the major cell of immune system involve in all of the activities of immunity (diversity, specificity. memory and self and non-self recognition). All the cells except RBCs and platelates reffered as WBO (leukocytes). the neutrophilis, basophilis and eosinophils are rich in grandular materials in cytoplasm and hence they are known as granulocytes. the monocytes. B cells (B lymphocytes). T cells (T lymphocytes) and natural killer cells are not rich in grandular mayerials and known as agranulocytes.

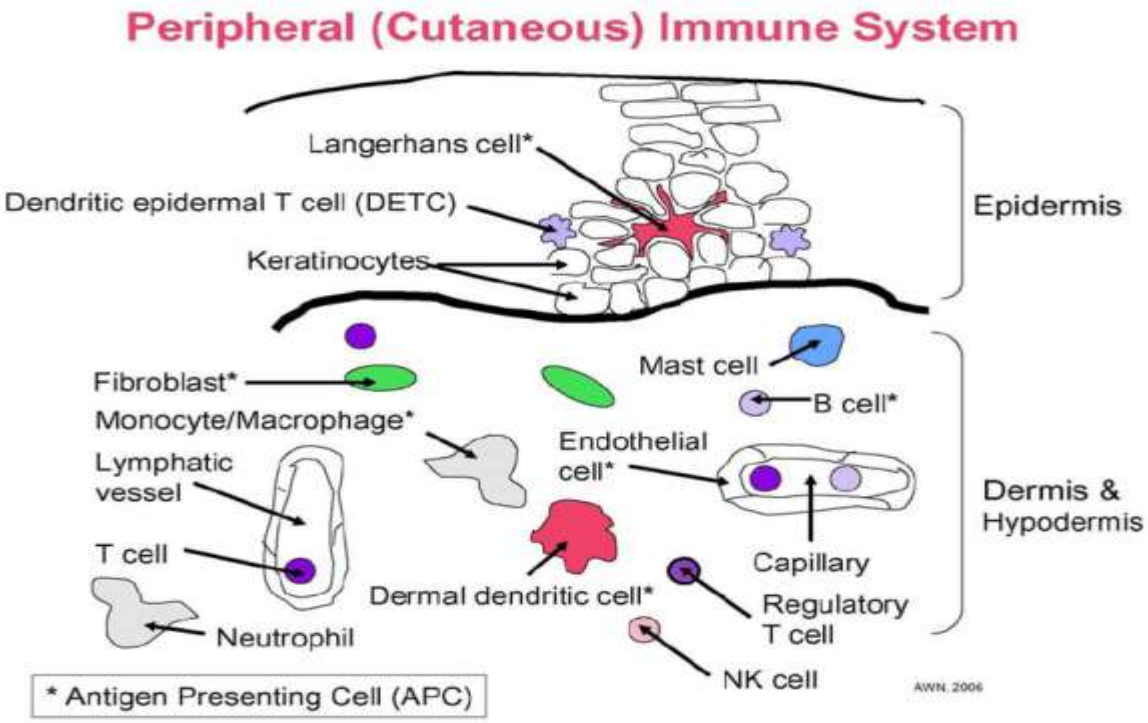
Peripheral (Cutaneous) Immune System
Langerhans cell*
Dendritic epidermal T cell (DETC)
Keratinocytes
Epidermis
Fibroblast*
Monocyte/Macrophage*
Lymphatic vessel
T cell
Neutrophil
Mast cell
B cell*
Endothelial cell*
Capillary
Dermal dendritic cell*
Regulatory T cell
NK cell
Dermis & Hypodermis
* Antigen Presenting Cell (APC)
AWN, 2006

Fig.1

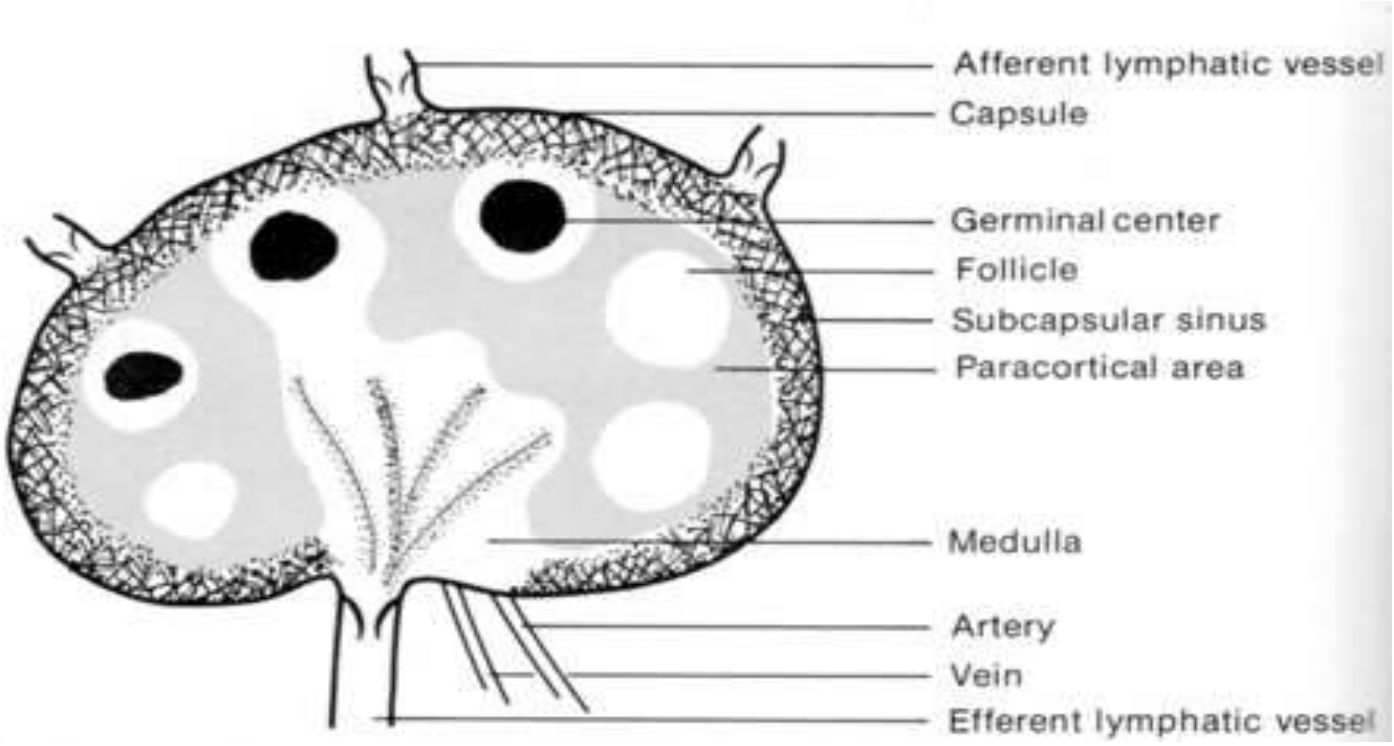
Afferent lymphatic vessel
Capsule
Germinal center
Follicle
Subcapsular sinus
Paracortical area
Medulla
Artery
Vein
Efferent lymphatic vessel

Fig.2

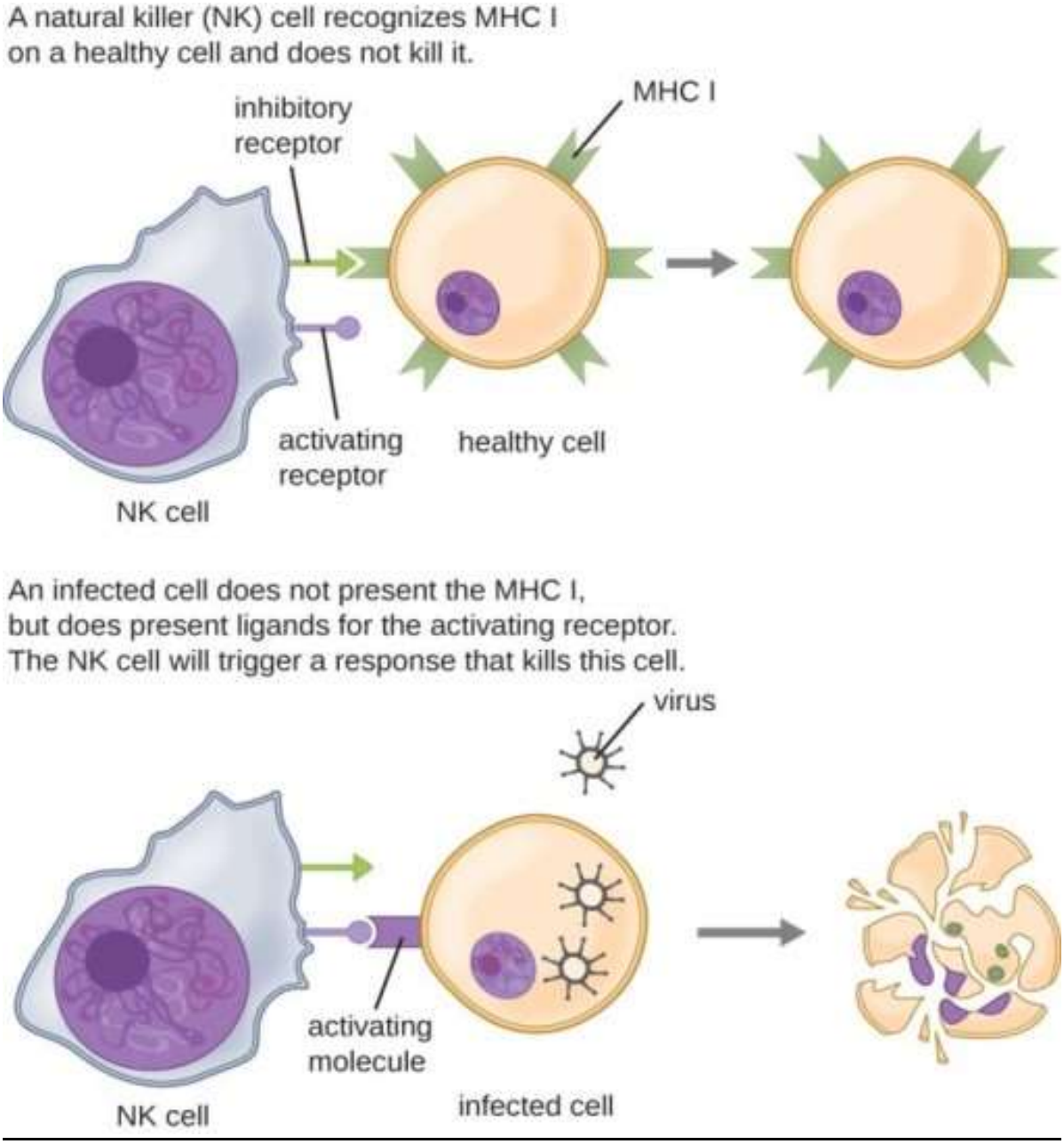
A natural killer (NK) cell recognizes MHC I
on a healthy cell and does not kill it.
inhibitory
receptor
MHC I
activating
receptor
healthy cell
NK cell
An infected cell does not present the MHC I,
but does present ligands for the activating receptor.
The NK cell will trigger a response that kills this cell.
virus
activating
molecule
infected cell
NK cell

Fig. 3.

AGRANULOCYTES

B cells (B lymphocytes): The B id derived from bursa of fabricius in birds or bone marrow the site maturation of the cells. This cells type is always having surfaced membrane bound antibodies (~1.5*10^8 antibodies per B cells). These after coming in contact with the antigen differentiate in to antibodies producing plasam cells and memory B cells, plasma cells, ehich lack membrane –bound antibody , synthesized and secrete one of the five classes of antibody . all clonal progeny from a particular B cells produce antibody with the same antigen binding specificity , the mature B cell contain number of membrane bound receptor molecules known as the Cluster of differentation (CD). Along with these number of membrane bound cluster of differentation (CD) . and B cells also have the capacity to presenting the antigen to immune system hence celled antigen presenting cells (APC). These cell contain CD40, CD45, CD35, CD21, CD80 and CD86 molecules. B cells are known to bind the soluble antigen , the major function of B cells in immune system in the synthesis of specific antibodies and the immunity obtained through the antibodies is known as humoral immunity (humor meaqns body fluid contained by antibodies). It constitutes 5-15% of the circulating lymphoid cells.

T cells (T lymphocytes):

The T is the T is derived from thymus, the site of maturation of the cells. these cells express various receptor molecules of the group CD3, CD4,

CD8, CD28, CD45 (Cluster of differentation) .

and Tcell receptor molecules (TCR) for antigen binding. Tcells are known to bind to the antigen, which are processed and present of the self-cell. there are three sub types identified in the t cells, namely, ata helper (TH) CELLS, T cytotoxic (TC) CELLS and T suppressor (TS) cells.

T helper cell (TH) interact with B cells to make antibodies and interact with phagocytes to destroy the pathogens. The TH Cells has CD4+ Surface molecules and reconizing antigen bound to class || major histocompatablity complex (MHC) molecules. T cytotoxic (Tc) cells having CD8+ surface Makers are responsible for elimination of host cells harboring virus and other pathogen. T suppessor (Ts) cells are known to suppress the functions of B and T cells, but still dispute is going on between immunologists regarding its exact function . the immunity obtained through the various T cells is known as cellular immunity.

Natural killer cells (NK cells):

The lymphocytes that are not having any type of surface receptors and fail to synthesized antibodies are caller null cells. Many of the null cells that are large , granular lymphocytes are called natural killer cells. It account for upto 15% of blood lymphocytes. These cells constitute 5%-10% of lymphocytes in human peripheral blood. The NK cells destroy tumor cells and virus infect cells. It is also produces gamma interferon (proteins involve in protection against viral infections) and bears CD2, CD16, CD56, Killer activatory (KAR) and killer inhibitory receptor (KIR) molecules on the surface.

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