28-12-21

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Department → AI Section → B

Subject → 18PCB101J - Biology Assignment.

- Write an assignment regarding the cells involved in immune system and their functions in innate immune response and acquired immune response.

- A cell is a part of immune system and helps the body fight infections and other diseases. Immune cells develop from stem cells in the bone marrow and become different types of white blood cells. These include neutrophils, eosinophils, basophils, mast cells, monocytes, macrophages, dendritic cells, natural killer cells, lymphocytes (B cells and T cells)

- Cells in Innate Immune system:

There are many types of white blood cells. or leukocytes, that work to defend & protect the human body.

(1) Phagocytes → They're eating cells that circulate throughout the body, looking for potential threats like bacteria & microbes to engulf & destroy.

(2) Macrophages → They're are efficient phagocytes cell that can leave the circulatory

systems by moving across the walls of ~~circulatory system~~ capillary vessels. It allows it it to hunt pathogens with less limits. Macrophages can also release cytokinins in order to signal & recruit other cells to an area with pathogens.

(3) Mast Cells → They're found in mucous membrane & connective tissue & are important for wound healing & defense against pathogens via the inflammatory response.

(4) Neutrophils → They're phagocytic cells that also classified as granulocytes because they contain granules in their cytoplasm. These granules are very toxic to bacteria & fungi.

(5) Eosinophils / Basophils : → They're granulocytes which target multicellular parasites.

(6) Natural Killer Cells : → They do not attack pathogens directly. Instead, they destroy infected host cells in order to stop the spread of an infection.

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(7) Dendritic Cells :→ They're antigen-presenting cells that are located in tissue & can contact external environments through the skins. Since they're located in tissue which are initial point for infectiously can identify threats & convey the rest immune system about it.

- Acquired immunity

Acquired or adaptive immune system uses specific antigens. To strategically mount an immuned system.

(1) B cells :→ After maturation and formation in the bone marrow, the naive B cells encounter an antigen, which starts the maturation process of B cells. They have one of millions distinctive surface antigen-specific receptors that are inherit to organism's DNA for example, naive B cells express antibodies on their cells surface which can also be called membrane-bound antibodies. Whenever naive B cells encounters an antigen that fits or matches it's membrane bound antibody it quickly divides in order to become a memory B cell or an effector B cell, which is also called plasma cells.

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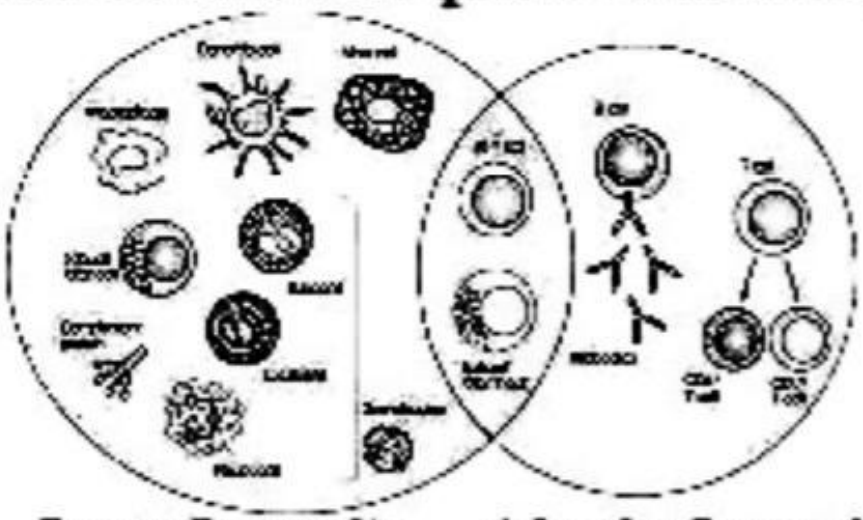
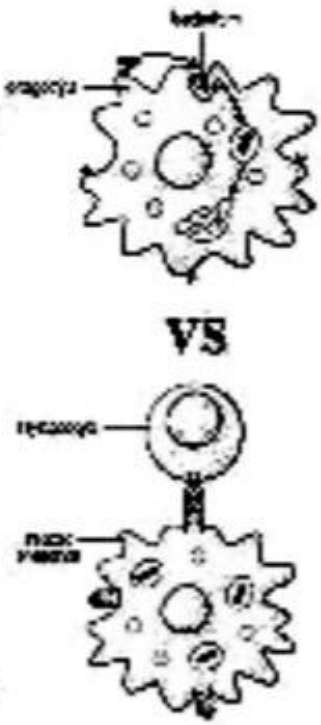
(2) T cells:→ Once formed in bone marrow, T progenitor cells migrate to the thymus to mature & become T cells. While in Thymus the ~~dev~~ developing T-cells start to express T cells receptor (TCRs) & other receptor called CD4 & CD8 receptors. All T cells express T cells receptors & either CD4 or CD8 not both. So, some T cells, will express CD4 & others will express ~~&~~ CD8. Unlike antibodies which can bind to antigens directly, T cells receptor can only recognize antigens directly that are bound to certain receptors molecule called Major Histocompatibility complex (MHC1) & Callasi (MHC11). These MHC molecules are membrane-bound surface receptors on antigen-presenting cells, like dendritic cells & macrophages CD4, CD8 play arole in T cells recognition & activation by binding to either MHC1 & MHC11.

Helper T-cells are arguably the most important Cells in adaptive immunity.

Difference between
Innate and Adaptive Immunity





INNATE

NONSPECIFIC
fast response (0-4 hours)

MONONUCLEAR PHAGOCYTE SYSTEM

macrophage

dendritic cell

monocyte

complement protein

natural killer cell

mast cell

basophil

eosinophil

neutrophil

granulocites

γδ T cell

natural killer T cell

ADAPTIVE

SPECIFIC
slow response (4-14 days)

HUMORAL

B cell

antibodies

CELLULAR

T lymphocyte

CD4+

CD8+