

**A.S.D.GOVERNMENT DEGREE COLLEGE FOR  
WOMEN (AUTONOMOUS) KAKINADA**

**DEPARTMENT OF MICROBIOLOGY**

*Cells of Immune System*

**II BSc CBMB SEM IV**



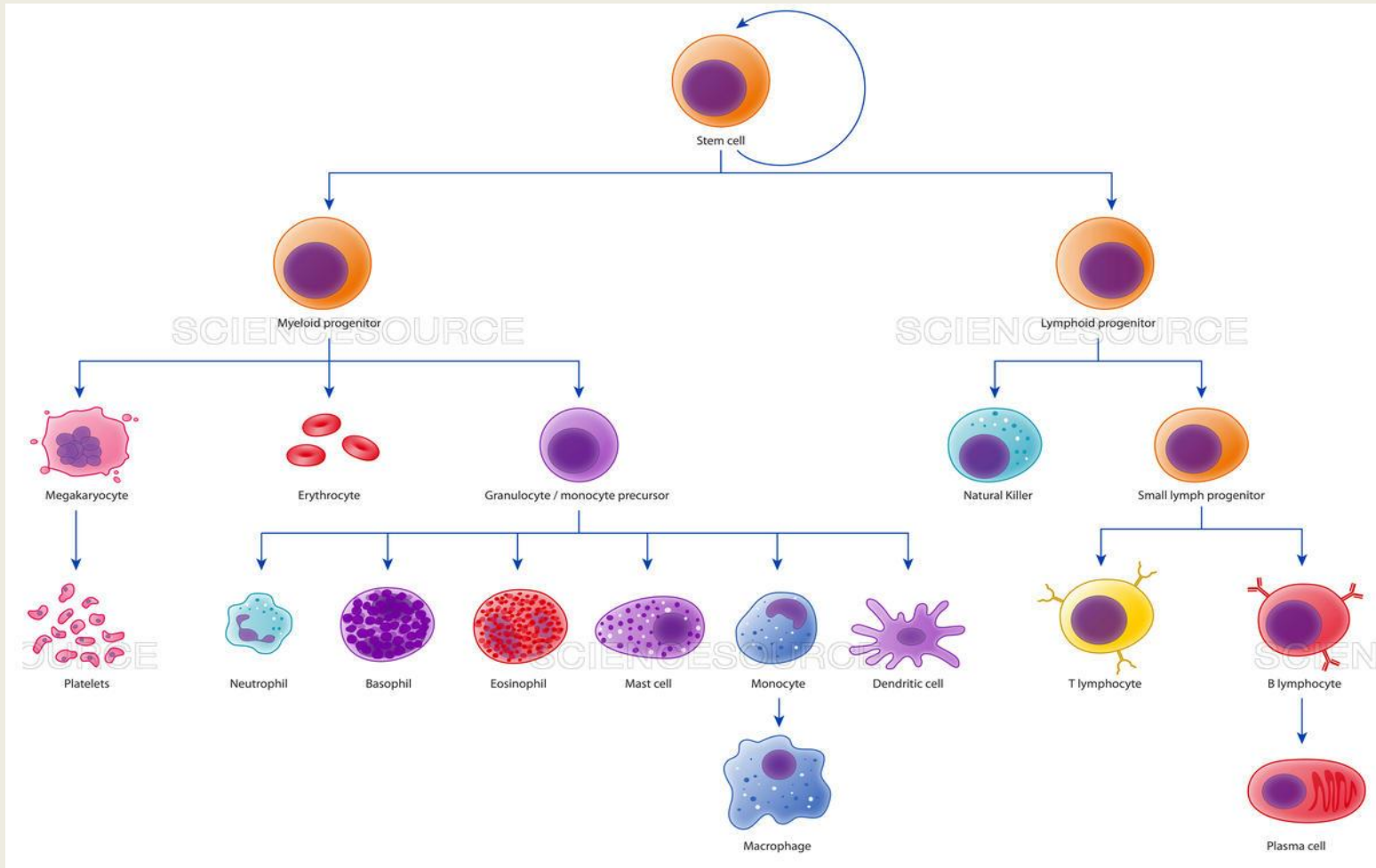
**BY**

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**Lecturer in Microbiology**

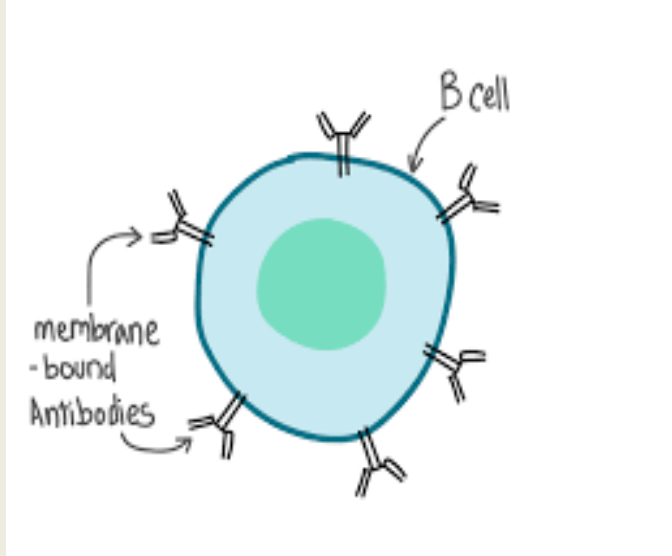
# Haematopoiesis

The formation of blood cellular components. All cellular blood components are derived from hematopoietic Stem Cell

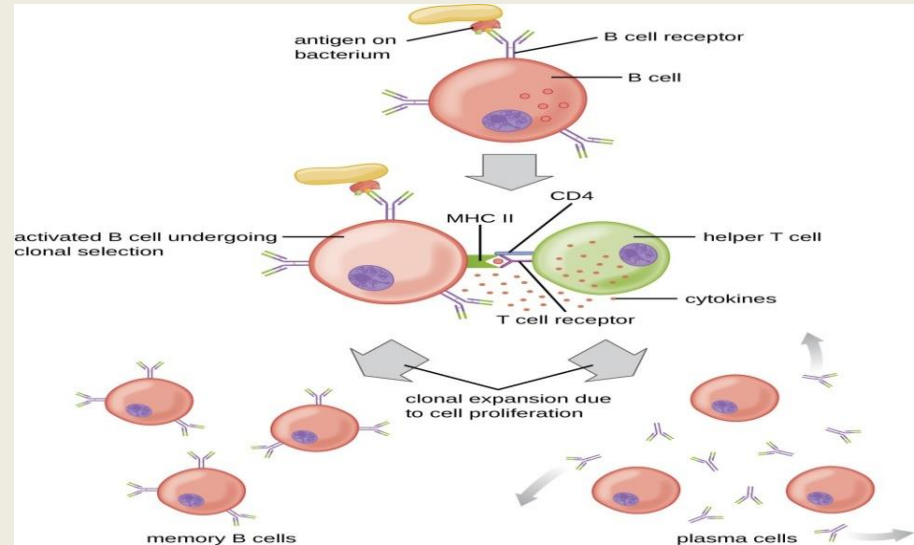


# Lymphocytes

## B-Cell Structure and Functions



**B Lymphocyte**



**B-Cell Activation and Differentiation**

## Characteristics of Mature B-Cells

### ➤ Specific differentiation

1. Plasma cells
2. Memory Cells

### ➤ Membrane –bound molecules

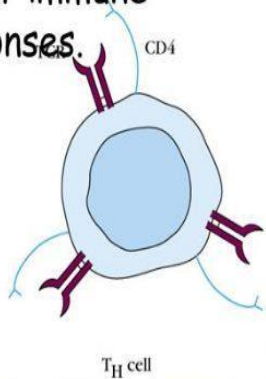
1. CD45 used as marker for B-cells
2. Class II MHC – allow the B-cell as antigen presenting Cell
3. CD35 and CD 21 receptors for complement
4. CD32 is receptor for Ig G
5. CD40 interact with the CD40 ligand of T helper Cell

# T -Cell Structure and Functions

## T cells:

### • Helper T cells (Th cells):

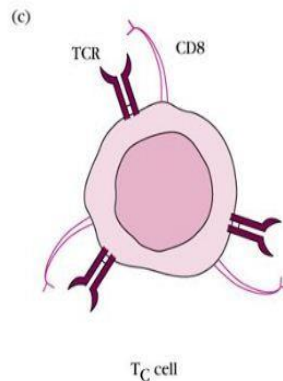
- T cell Receptor (TCR)
- CD4+
- Produce cytokines & direct immune responses.



T<sub>H</sub> cell

### • Cytotoxic T cells (Tc or CTL):

- TCR+
- CD8+
- Cytotoxic



T<sub>C</sub> cell

## Difference between helper T cells (CD4) and cytotoxic T (CD8) cells

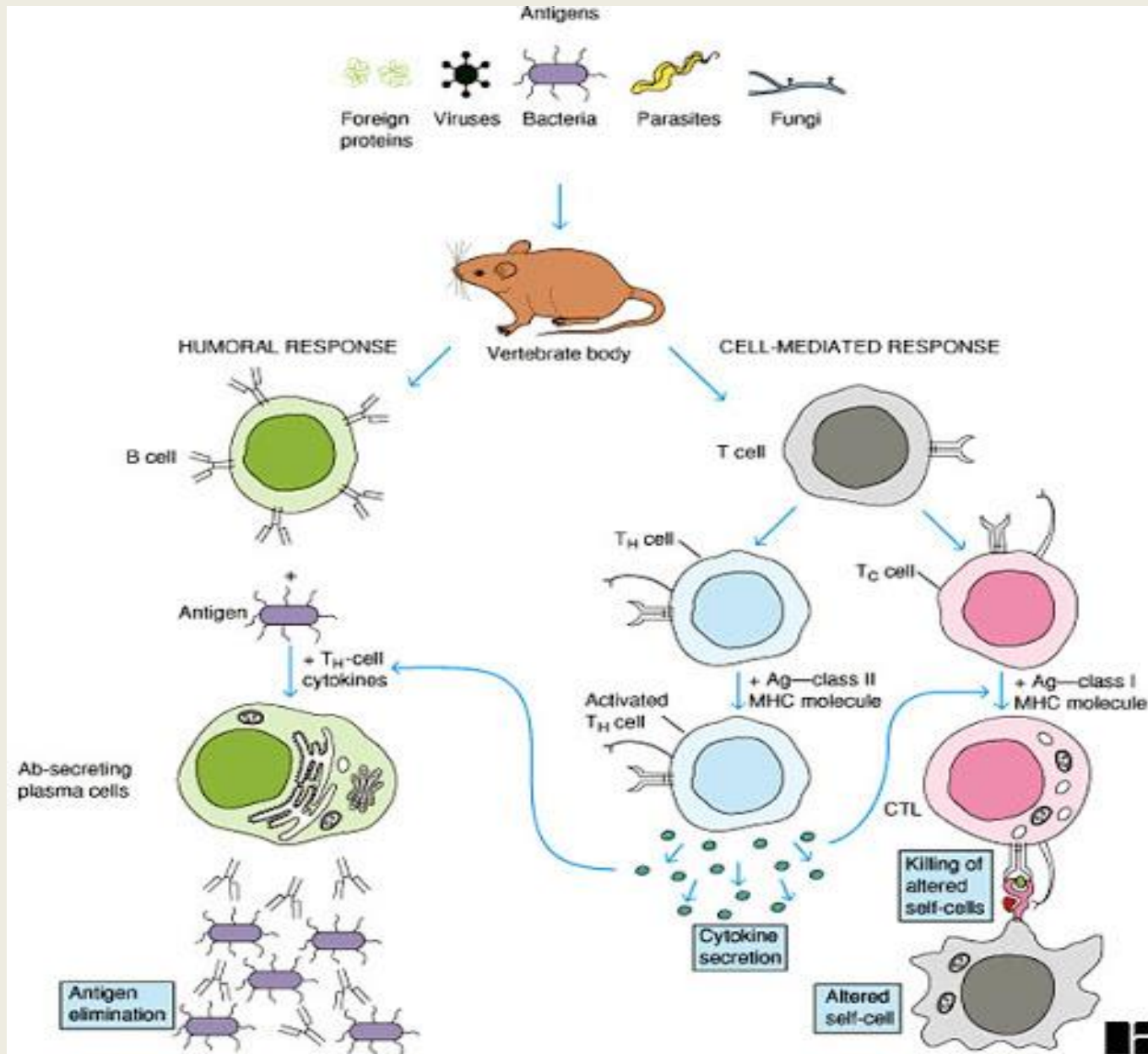
Helper T cells	Cytotoxic T cells
Carries CD4 marker	Carries CD8 cells
Helps or induce immune response.	Predominantly cytotoxic
Recognizes antigens in association with class II MHC	Recognize antigens in association with class I MHC
APCs are activated to kill intracellular microorganisms by secreting cytokines.	Destroy virus-infected and tumor cells directly

## 1. Regulatory T-Cell : T helper Activates the B – Lymphocytes and control the development of effectors T-cell (Tc)

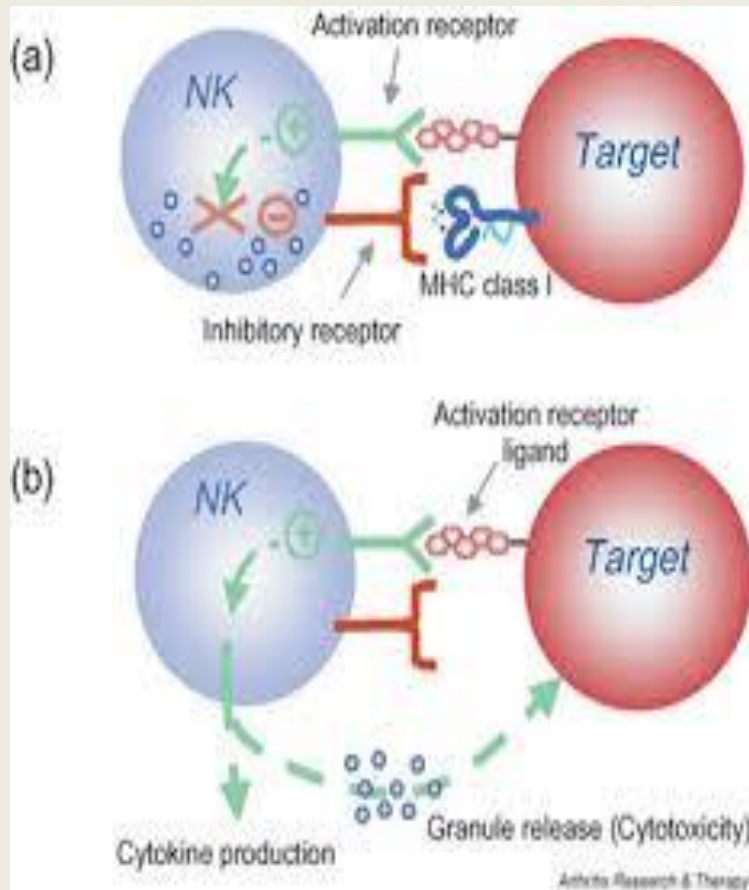
- TH1 secretes IL2, IFN-  $\gamma$  and INF-  $\beta$  – involve in Cellular immunity  
macrophage activation and responsible for delayed type of hypersensitivity
- TH2 secretes IL4,5,10 and 13 –involved in Humoral immunity

## 2. Effector T-Cell : Tc cell attacks the virus infected cell

# Humoral and Cellular Immunity



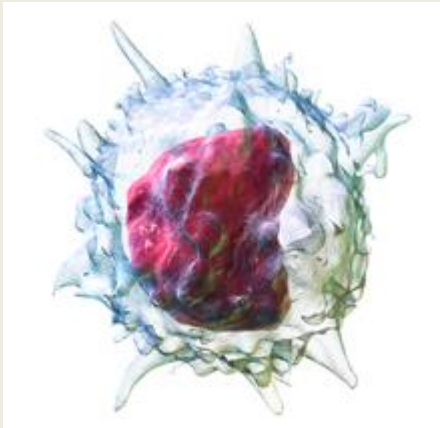
# Null Cells (Natural Killer Cells or NK Cells )



❖ NK cells express CD16, a membrane receptor for the Fc region of IgG

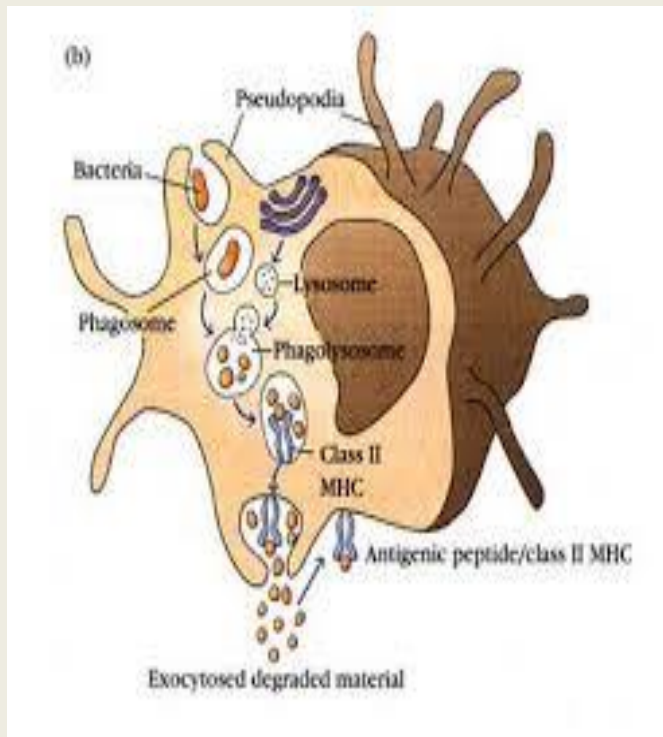
❖ NK cells destroy target cells by a process called ADCC

# Monocyt and Macrophage



## Monocytes:

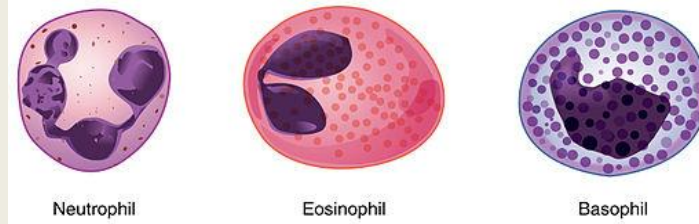
These are produced in bone marrow and enter the blood and enlarge in size, migrates into the tissues as macrophage



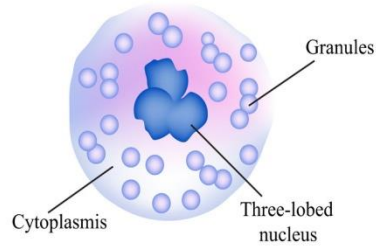
## Macrophage :

These are Highly phagocytic and are capable of ingesting and digesting exogenous antigens

# Granulocytes

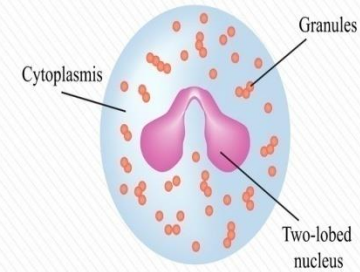


## Basophil



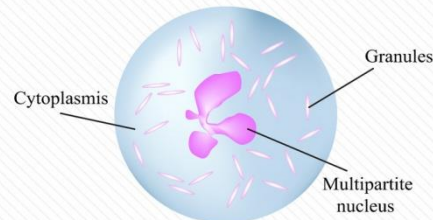
Generation of histamine for inflammatory responses

## Eosinophil



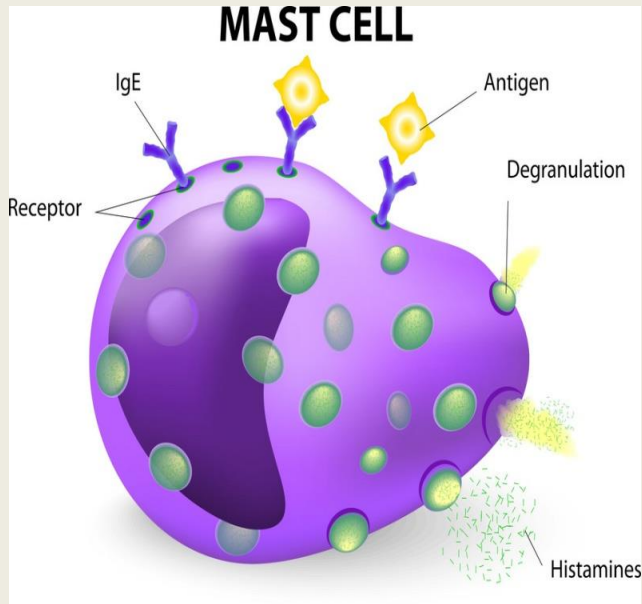
Neutralize parasitic infections

## Neutrophil



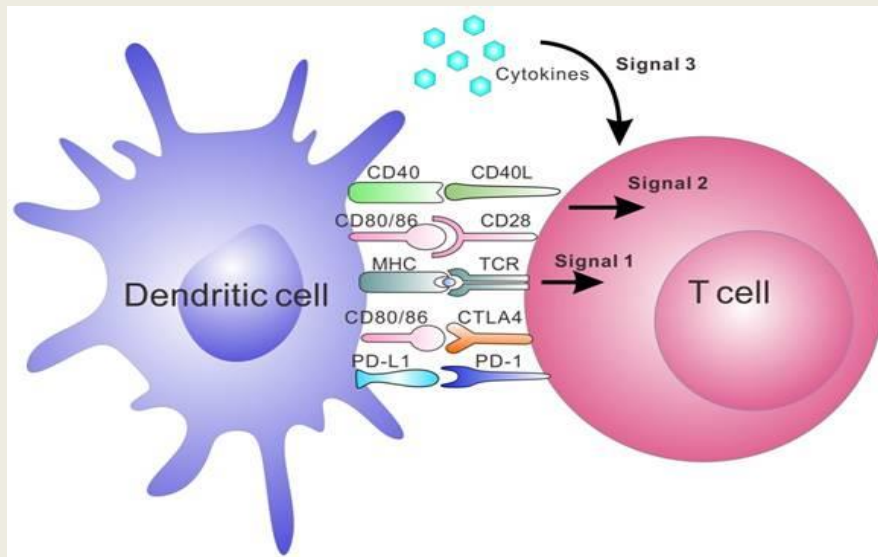
Protects against bacterial and fungal infections

# Mast and Dendritic Cell



➤ Mast cells produced in bone marrow and released into the blood as undifferentiated cell

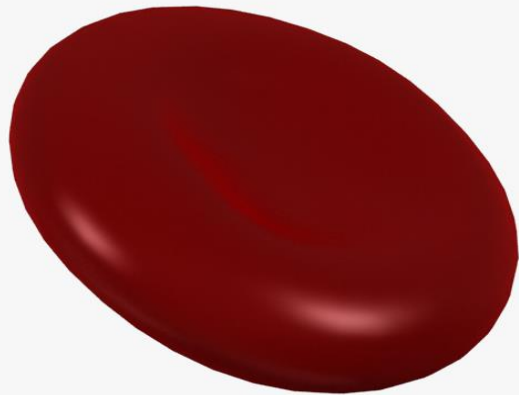
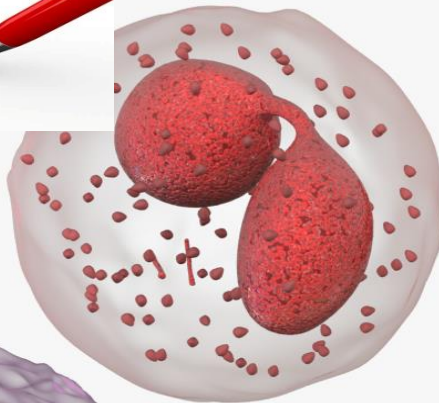
➤ Play an important role in in the development of allergic reactions and hypersensitivity reactions



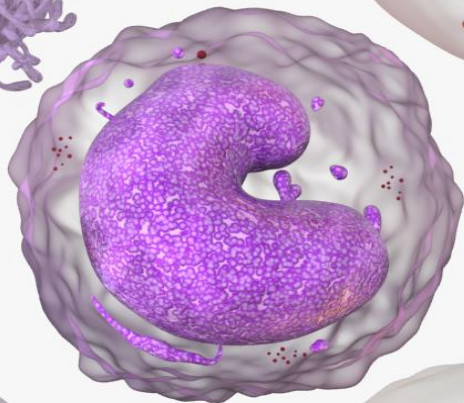
**Dendritic Cells functions as antigen presenting Cell (APC) and more potent APC than Macrophage and B-lymphocytes**



Thank you



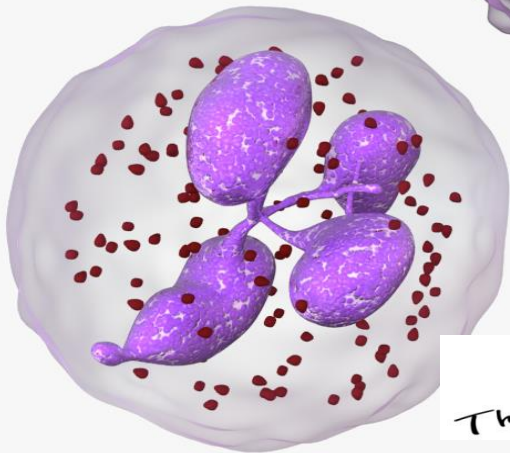
Thank you



Thank you



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