Department of Anesthesia Techniques

Title of the lecture:WHITE BLOOD CELLS & platelets

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WHITE BLOOD CELLS
&
platelets

LEUCOCYTES

- White blood cells or leucocytes are defined as a white or colorless blood cells.
- They are capable of amoeboid movement
- Its chief functions is to protect the body against micro organisms causing disease
- Leucocytes are formed in the bone marrow from myeloid stem cells and some being formed in the lymph nodes from lymphoid stem cells
- Leucocytes are the units of the body’s resistance to infection, disease

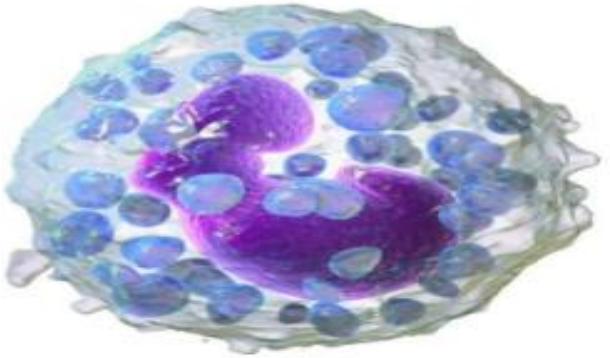
CLASSIFCATION

- They are classified in two main groups which are granular or agranular.
- This is dependent on whether they contain conspicuous (visible) chemical filled cytoplasmic granules (vesicles), that are made visible by staining.

Granular	Agranular
Basophils	Lymphocytes
Neutrophils	Monocytes
Eosinophils	

1.GRANULAR LEUCOCYTES

A- **BASOPHILS**



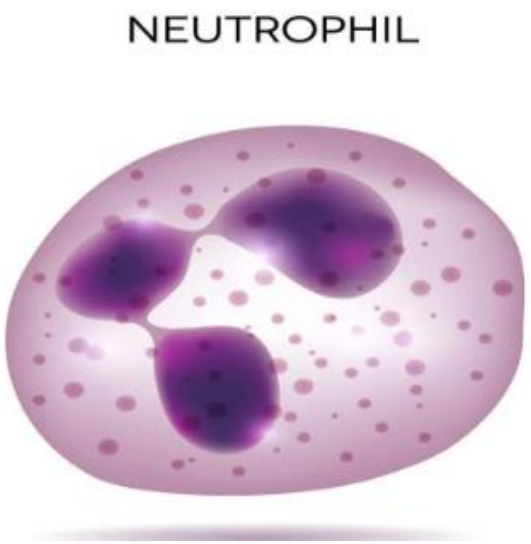
Basophil

- Make up 0.5-1% of all white blood cells.
- They are 8-10 micrometer in diameter
- The nucleus contains 2 lobes
- When stained, large cytoplasmic granules appear deep blue-purple.

BASOPHILS FUNCTION:

Liberate heparin, histamine, and serotonin in allergic reactions that intensify the overall inflammatory response .

B-NEUTROPHILS

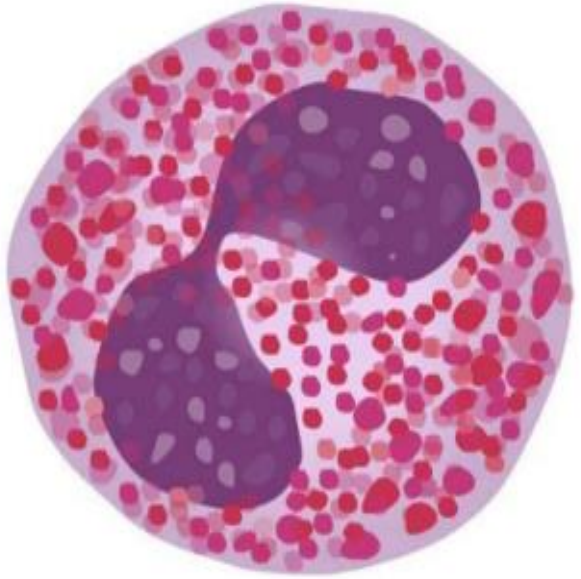


- Make up 60%-70% of all white blood cells.
- They are normally 10-12 micro meters in diameter
- The nucleus contains 2-5 lobes connected by thin strand of chromatin
- The cytoplasm has very fine, pale lilac granules

NEUTROPHILS FUNCTION :

- Its functions as a phagocyte
- Destroy bacteria with lysozyme, defensins and strong oxidocents such as superoxide anions, hydrogen peroxide and hydrochlorite anion.

C- EOSINOPHILS



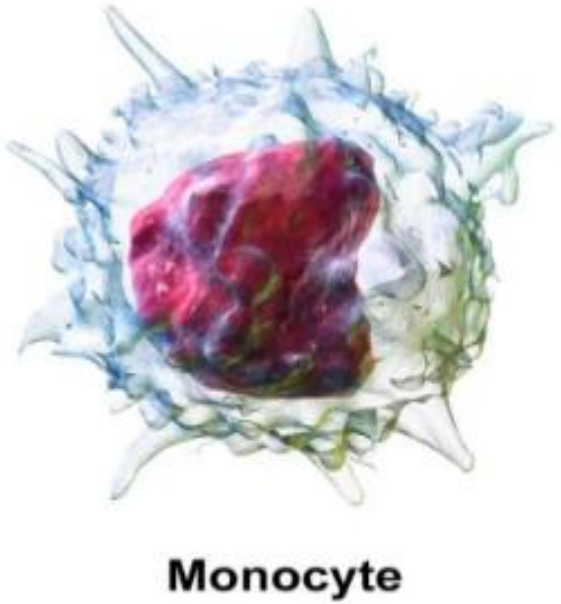
- Makes up 2-4% of all white blood cells.
- They are 10-12 micrometer in diameter
- Its nucleus has 2 or 3 lobes: large, red-orange granules fill the cytoplasm.

EOSINOPHILS FUNCTION :

- Combat the effects of histamine in allergic reactions,
- Phagocytize antigen-antibody complexes
- Destroy certain parasitic worms.

2- AGRANULAR LEUCOCYTES

A- MONOCYTES :


Monocyte

- They are 12-20 micrometer in diameter
- The nucleus is kidney shaped or horseshoe shaped
- Cytoplasm is blue-gray and has foamy appearance.
- Make up 3-8% of all white blood cells.

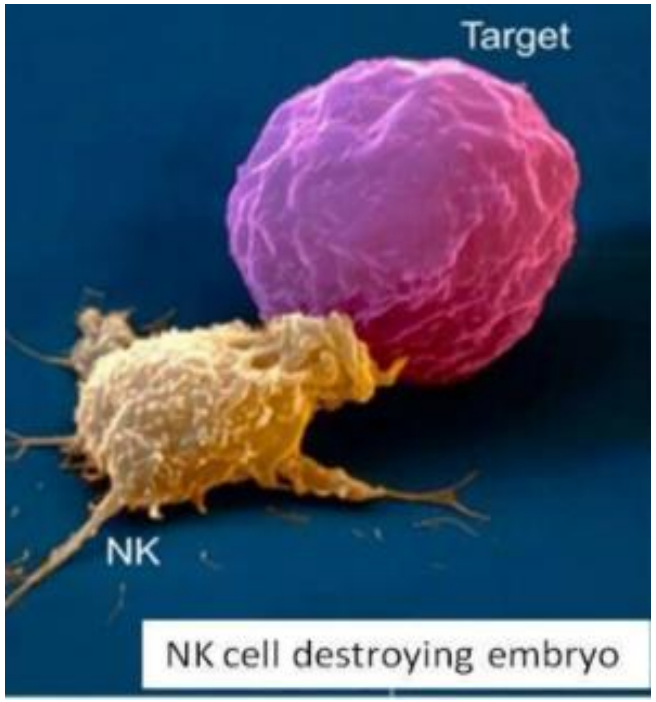
MONOCYTES FUNCTION:

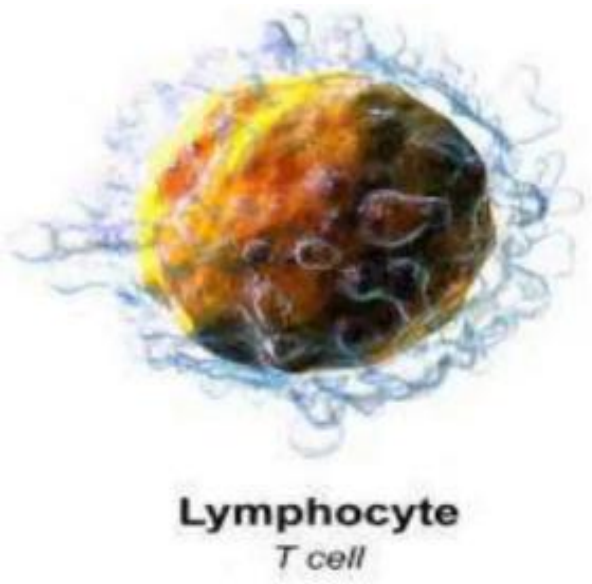
✓ Phagocytosis this occurs after they transform into fixed or wandering macrophages.

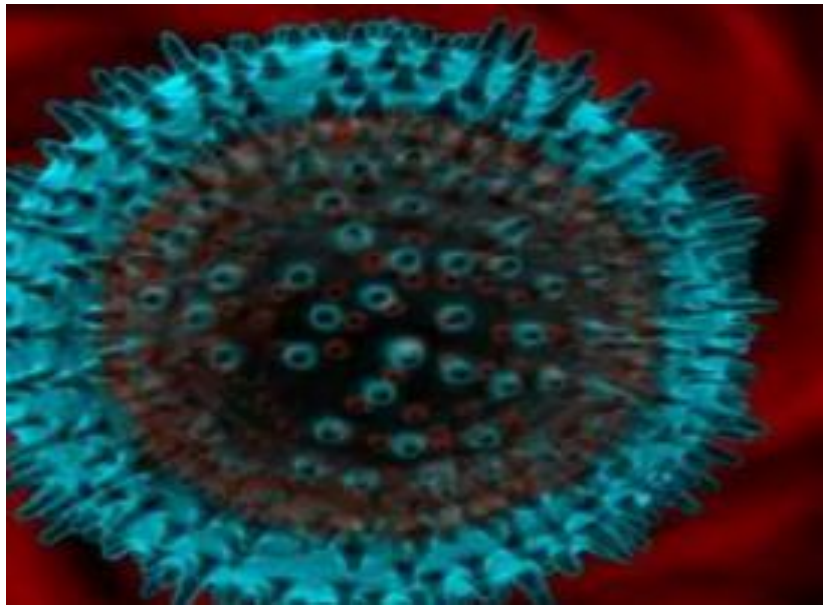
B-LYMPHOCYTES

Lymphocytes are divided in to three subtypes :

- ❖ T Cells
- ❖ B cells
- ❖ Natural killer cells







B cell (Ab)

LYMPHOCYTES characterizes :

- nucleus is round or slightly indented
- cytoplasm forms a rim around the nucleus that looks sky blue
- the larger the cell, the more cytoplasm is visible.

FUNCTION :

- Mediate immune responses, including antigen- antibody reactions.
- B cells develop into plasma cell, which secrete antibodies.
- T cells attack invading viruses, cancer cells and transplanted tissue cells.
- Natural killer cells attack a wide variety of infectious microbes and certain spontaneously arising tumor cells.

Platelets

❖ Platelets are not cells but cytoplasmic fragments of extraordinarily large (up to 60 µm in diameter) cells called megakaryocytes.

❖ Normal Platelet Count: 130,000 – 400,000/µl

❖ originate in bone marrow from giant cell megakaryocyte

❖ Contain several clotting factors – calcium ions, ADP, serotonin .

❖ They are called thrombocytes because they involve in the process of thrombus formation (clotting).

Function :

•The main function of platelets is to initiate clotting by converting prothrombin into thrombin

THANK YOU....