**2.White blood cells:**

Less than RBC in number, with no pigment, it contain nucleus and other cell organelles. The number of WBC changed daily ,and with feeding and stress. White blood cells only make up about 3 % of blood cells, but their small number belies their immense importance. They play a vital role in the body’s immune system—the primary defense mechanism against invading bacteria, viruses, fungi, and parasites. Total number in human: is' about 8000 cell /cm3 blood.

WBC Classified into two main groups: \*Granulocytes(Polymorphonuclear granulocytes):

Contain granules in the cytoplasm and nucleus more than one lobes, which subdivided into three types according to the granules staining:

1-Neutrophils. 2-Acidophils. 3-Basophils.

\*Agranulocvte: no granules in the cytoplasm and nucleus of one lobe, divided into two types :

1-Lymphocyte. 2-Monocyte.

Granulocytes:

-Neutrophils:

1-Form about 65% of total WBC, and it is motile cells.

2-Granules stained with neutral stain, which have light colour.

3-Nucleus consist from more than one lobes (3-5 lobe).

4-Women may show drum stick .

Function:

Neutrophil act as phagocytic cells , its function is defense against microbes , and it formed in bone marrow.

-Acidophil (Eosinophils):

1-Its percentage is 4% .

2-Nucleus bilobed.

3-Cytoplasm contain acidophilic granules .

4-Formed in bone marrow.

Its function is related to allergic conditions & some parasitic cases.

**-Basiophil:**

1- Its percentage is 1% .

2- Nucleus longitude as S shape .

3-Cytoplasm contain basophilic blue granules.

4-Formed in bone marrow. In the tissues, they are called [mast cells](http://training.seer.cancer.gov/ss_module08_lymph_leuk/leuk_unit02_sec02_composition.html).

Its function is formation of heparin & histamine.

Agrnulocvtes :. lymphocyte ;

1-its percentage is 25%.

2-Nucleus is large .

3-Cytoplasm with no granules & as a thin layer a round the nucleus .

4-Formed in lymphatic tissues (lymph node, spleen, tonsils, thymus gland).

Its function is formation of antibodies

monocyte:

1-Its percentage is 5%.

2-Large cells .

3-Nucleus large and take one side in the cell & the cytoplasm in

other side

4-Formed in spleen & bone marrow.

Its function : phagocytosis of microbes

**3- Thrombocytes (platelets):**

Thrombocytes, or platelets, are not complete cells, but are small fragments of very large cells called [megakaryocytes](http://training.seer.cancer.gov/ss_module08_lymph_leuk/leuk_unit02_sec02_composition.html). Megakaryocytes develop from hemocytoblasts in the red bone marrow. Thrombocytes become sticky and clump together to form platelet plugs that close breaks and tears in blood vessels. They also initiate the formation of blood clots.



