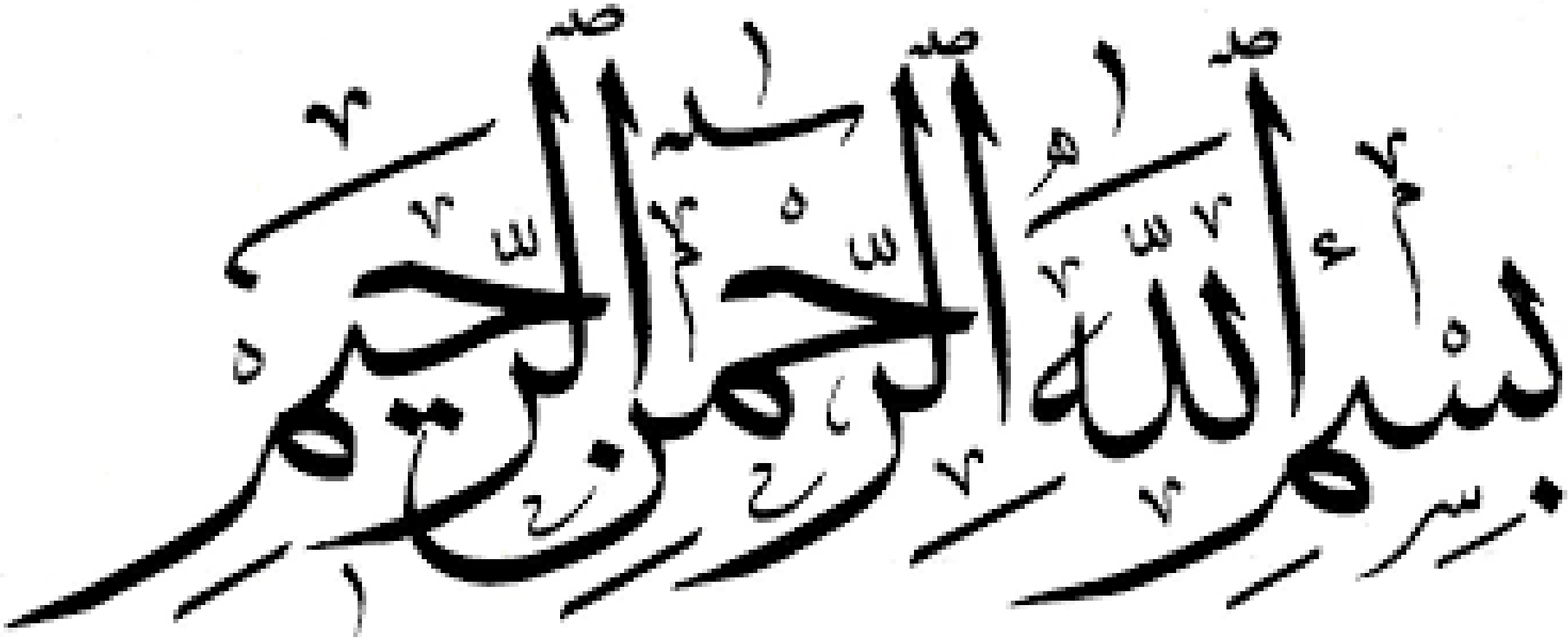
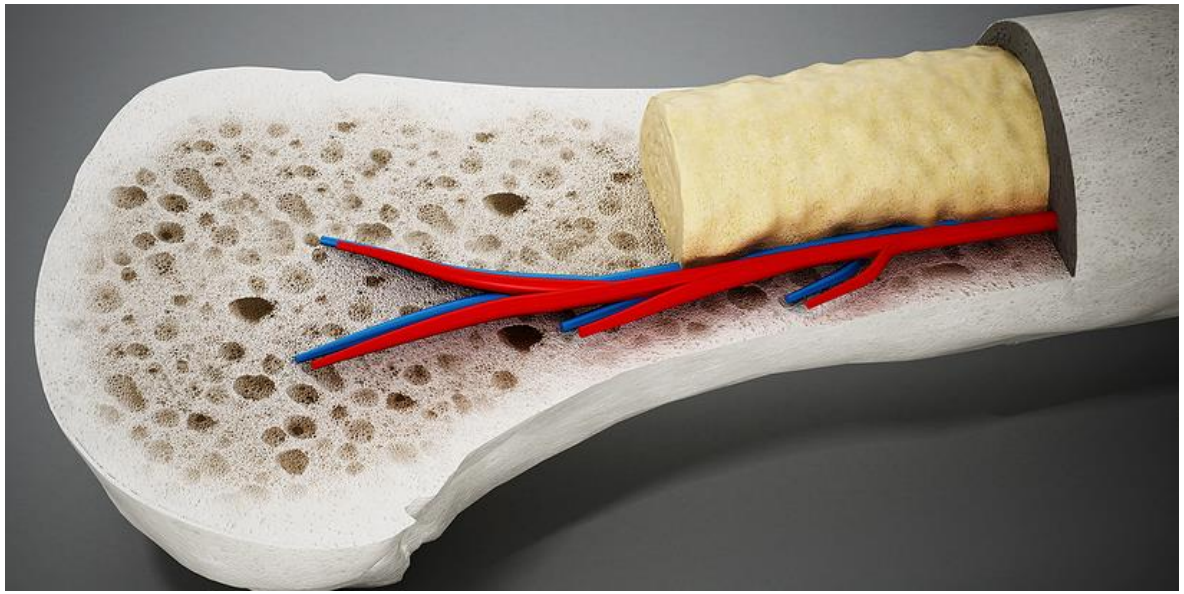
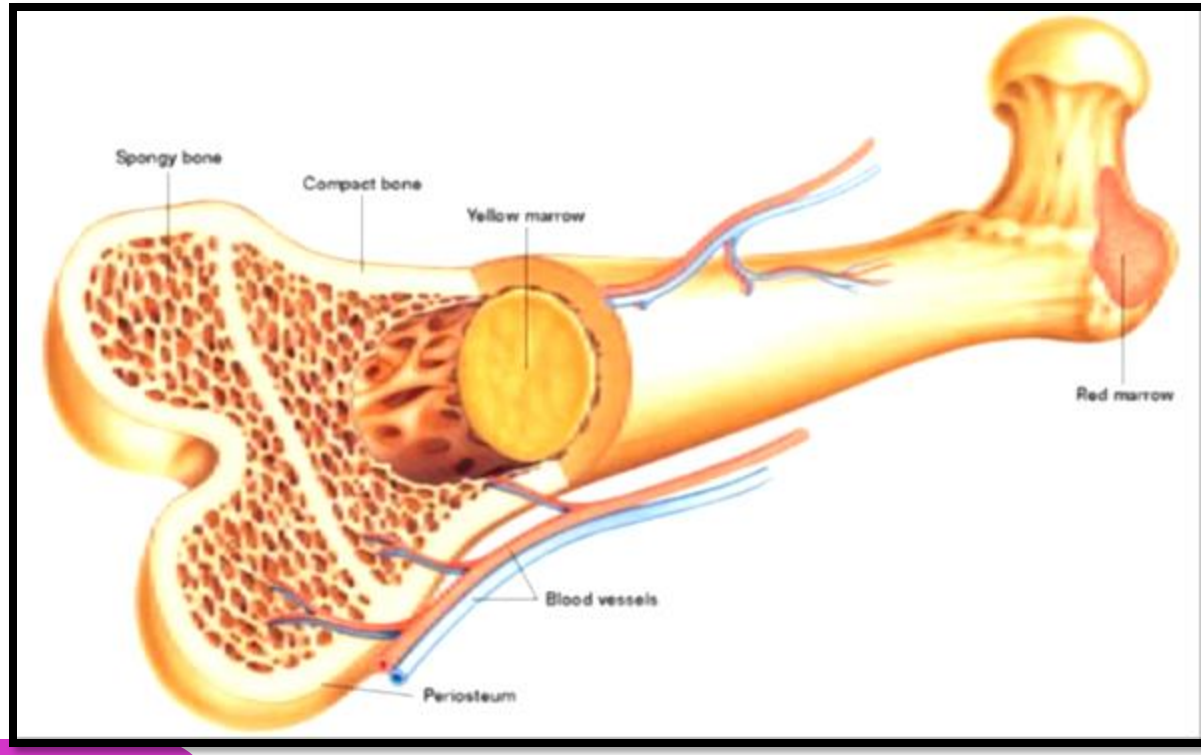

بسم الله الرحمن الرحيم

# MYELOID TISSUE
# Bone Marrow

*DR. Ola Abd El Latef*



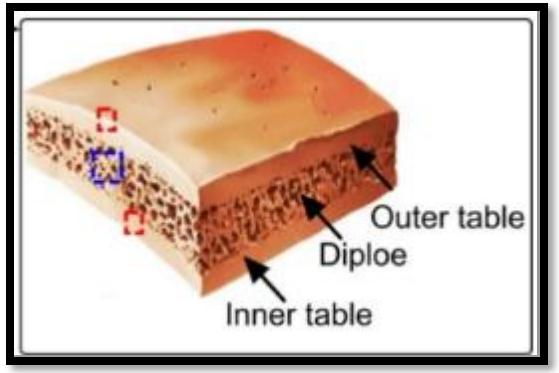
# Types




1.Red bone marrow (active).
2.Yellow bone marrow (inactive).

# Active (red) bone marrow

# Sites

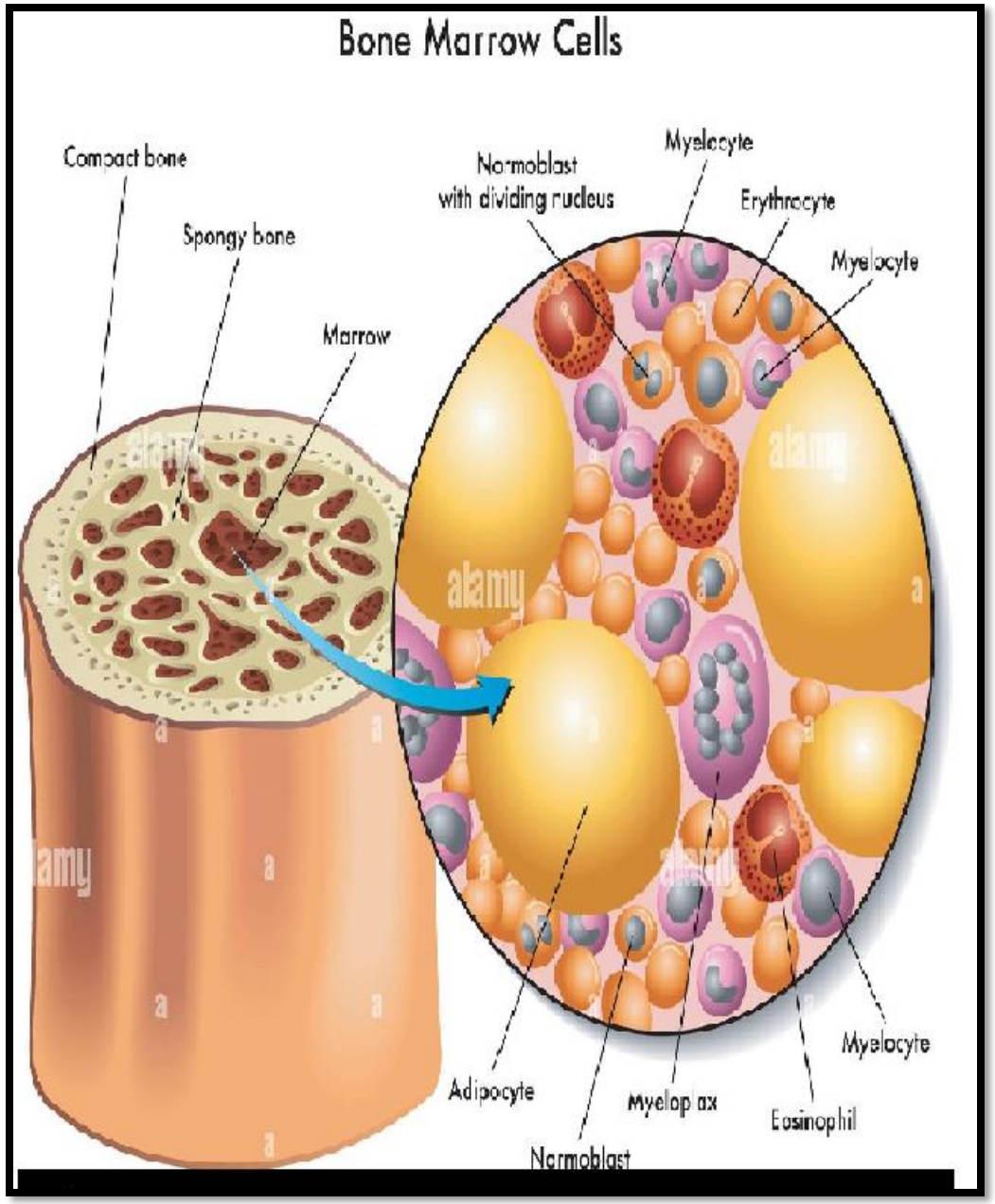



**In fetus:**

-Present in most of the bone.

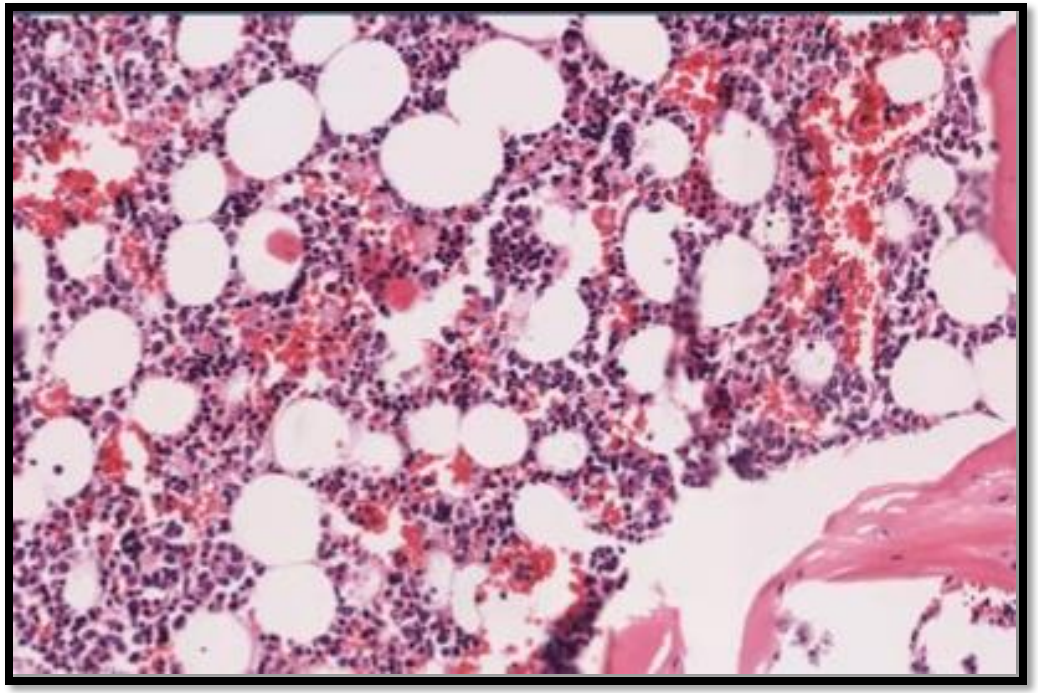
**In adult:**

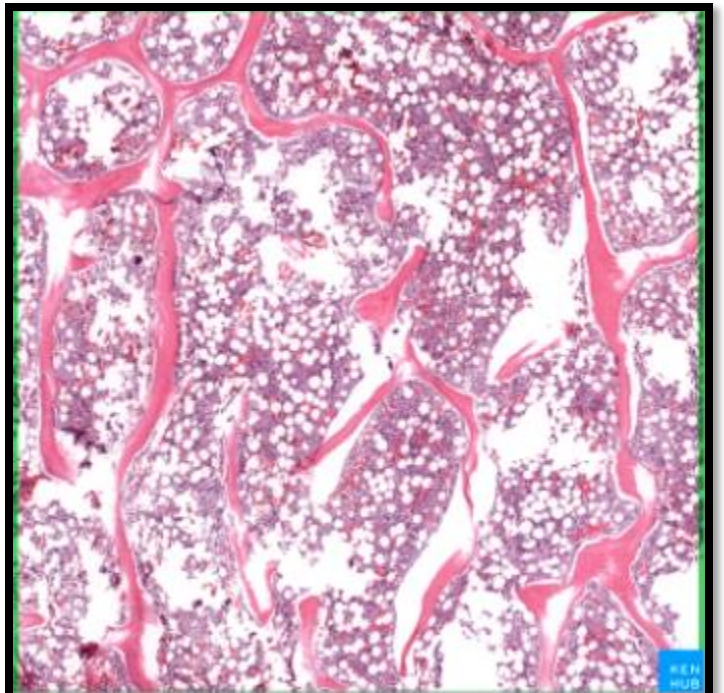
-Flat bone (skull and pelvic bones, sternum, ribs, clavicle and vertebrae).



# Structure:

- I. Stroma of fixed elements.
- II. Blood sinusoids.
- III. Free cells.

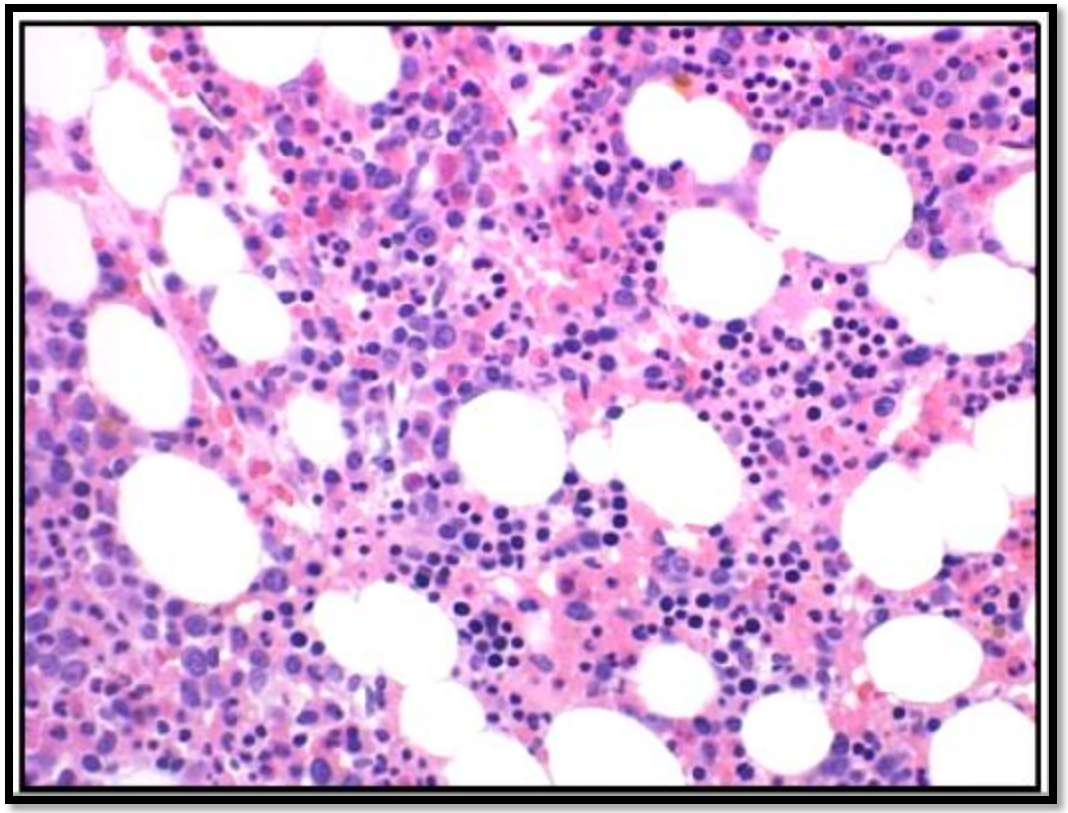




# A. Stroma “fixed elements”:

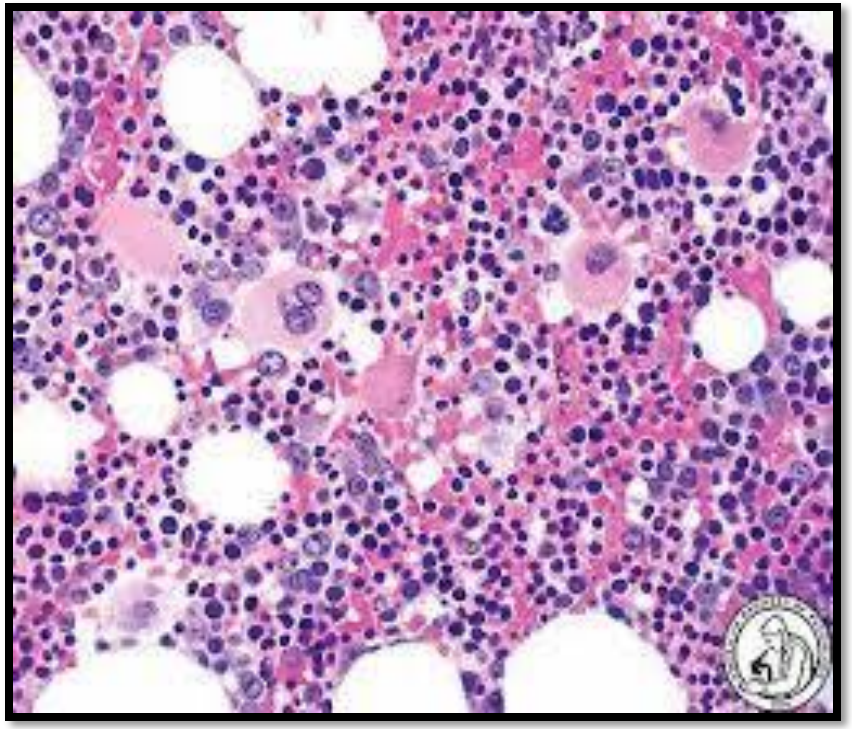
It is a network of reticular fibers containing:

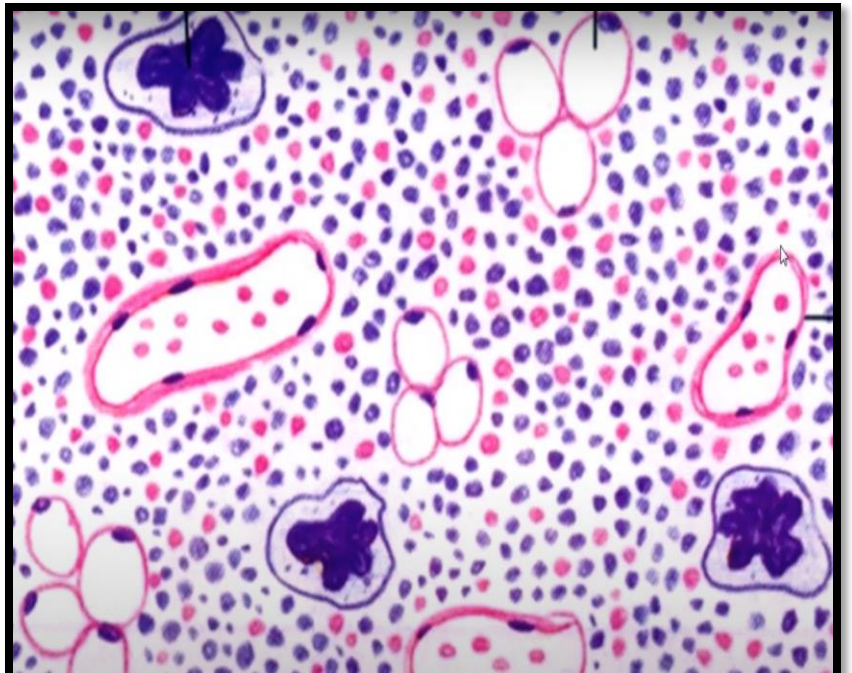
1. **C.T cells**: Reticular cells,Fibroblasts andFat cells.
2. **Pericytes**.
3. **Bone cells**: Osteogenic cells, osteoblasts and osteoclasts.
4. **Endothelial cells**: Lining blood vessels.
5. **Matrix**: formed of collagen, glycoproteins and proteoglycan substances.



# C- Free cells:

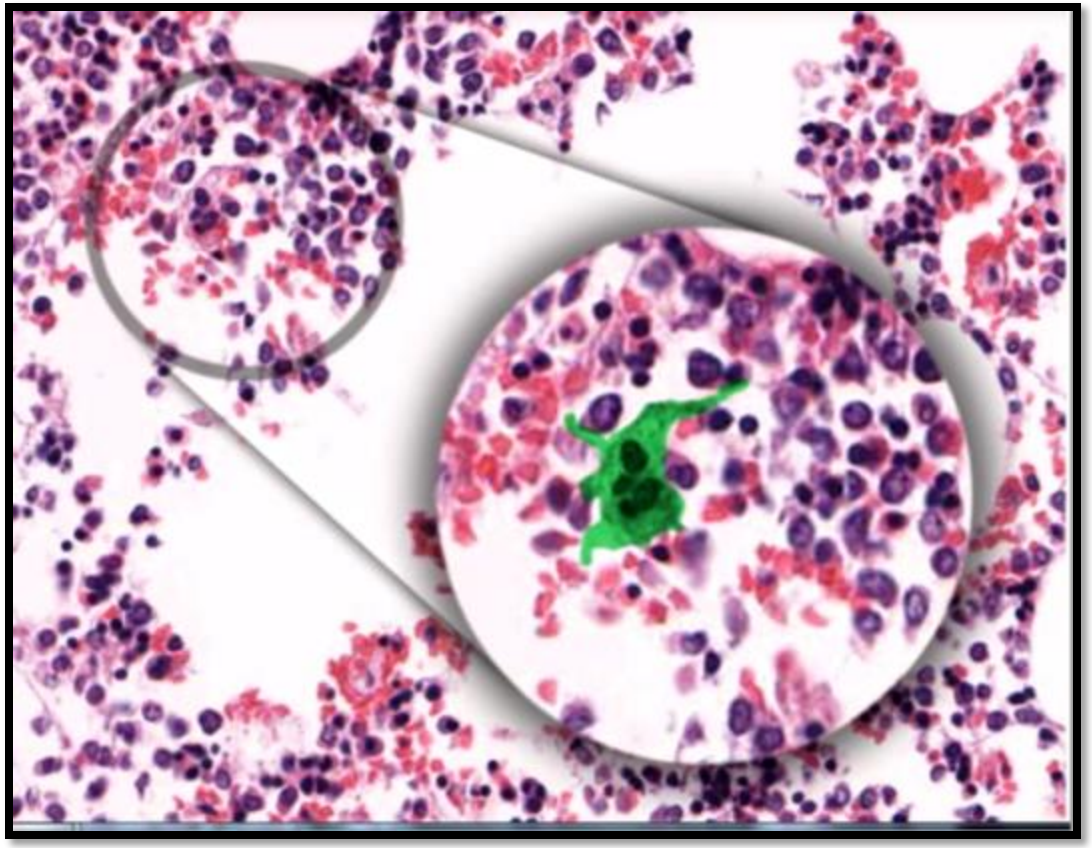
- These are blood cells in various degree of development.
- Developing leucocytes are called **myeloid tissue.**
- Developing erythrocytes is called **erythroid tissue.**
- Myeloid / Erythroid ratio is **5-1.**
- The bone marrow forms more leucocytes than RBCs, as leucocytes have shorter life span.





# Function

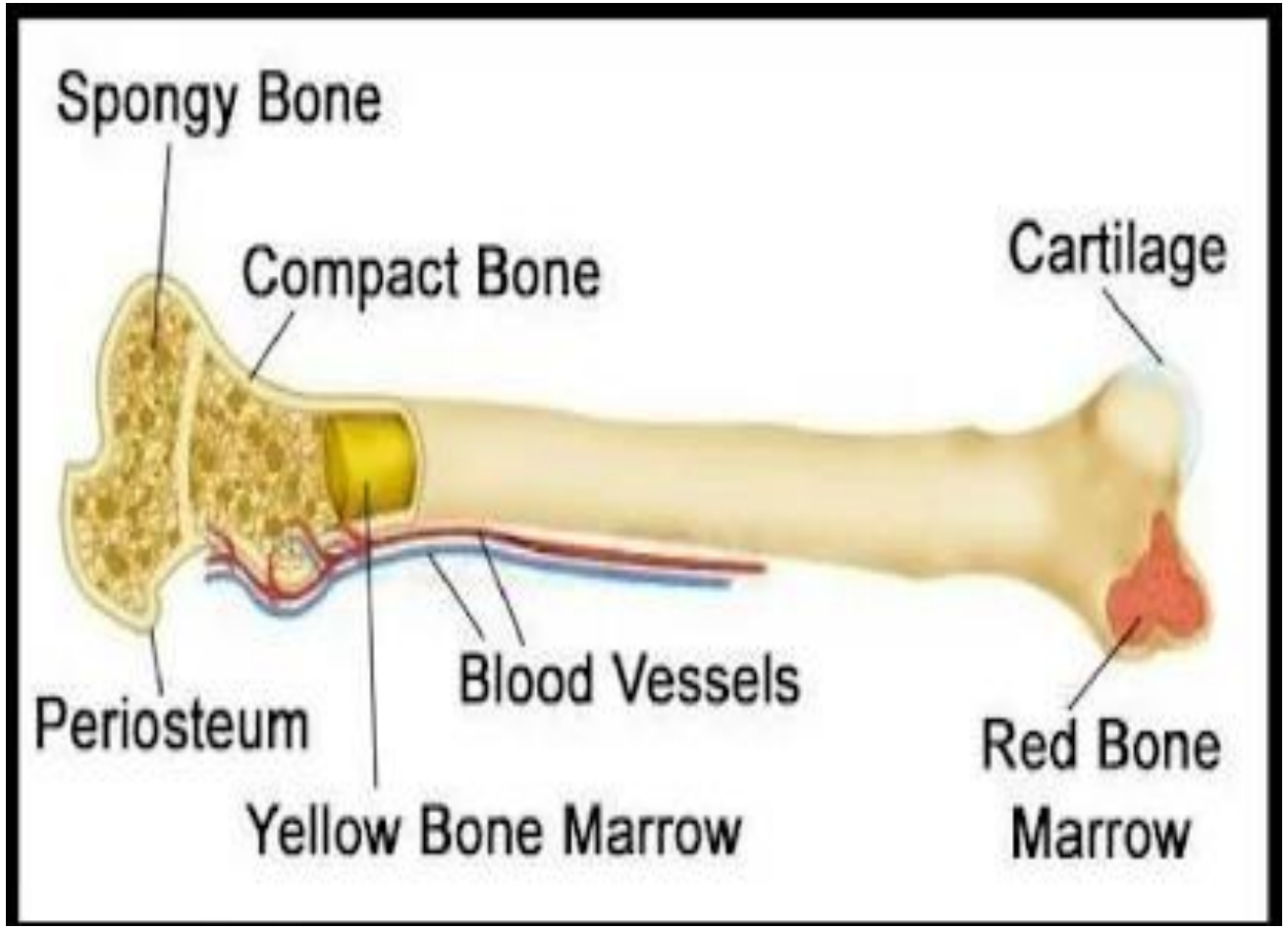
1. Formation of **blood cells.**
2. Destruction of **old RBCs** by the macrophages.
3. Storage of **iron** in the macrophages.
4. Storage of **fat** in the fat cells.



# Inactive (Yellow) bone marrow

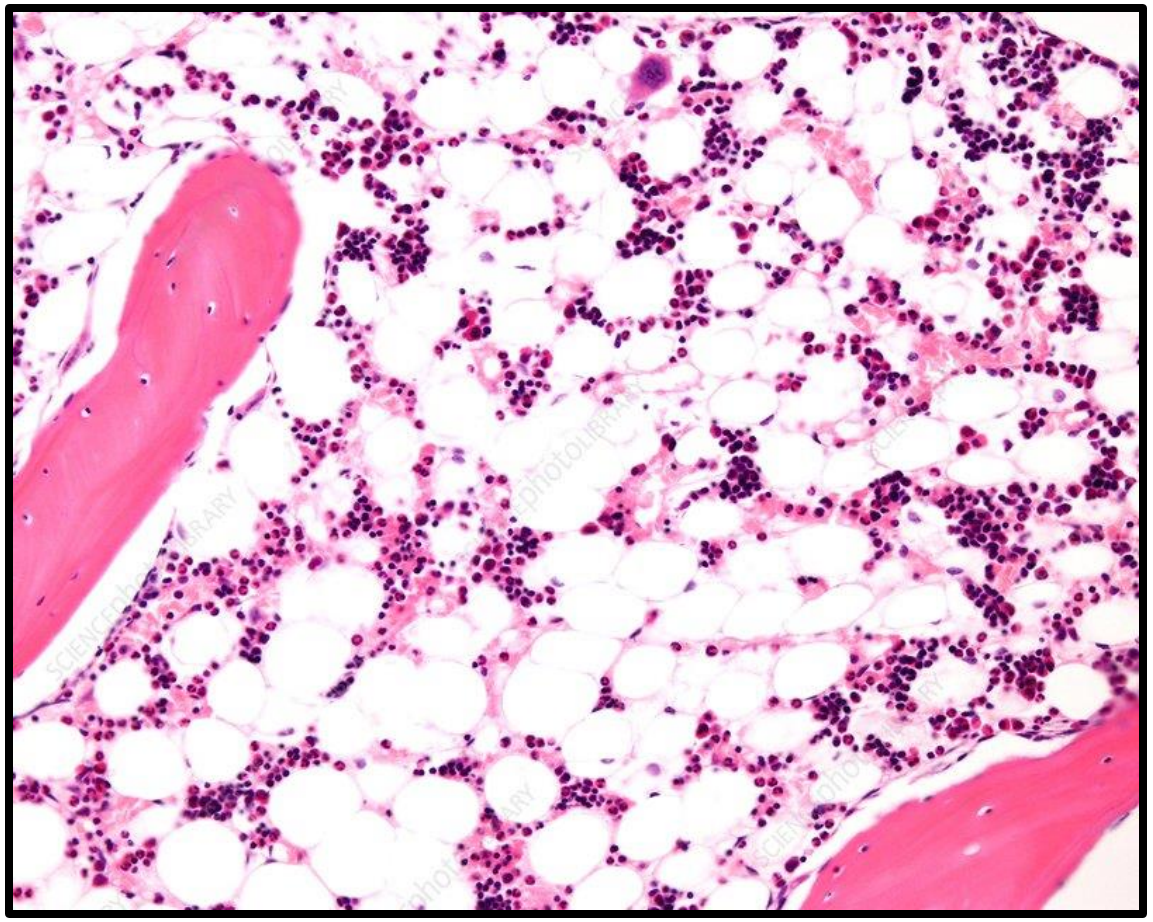
## Site

## Shaft of long bone.

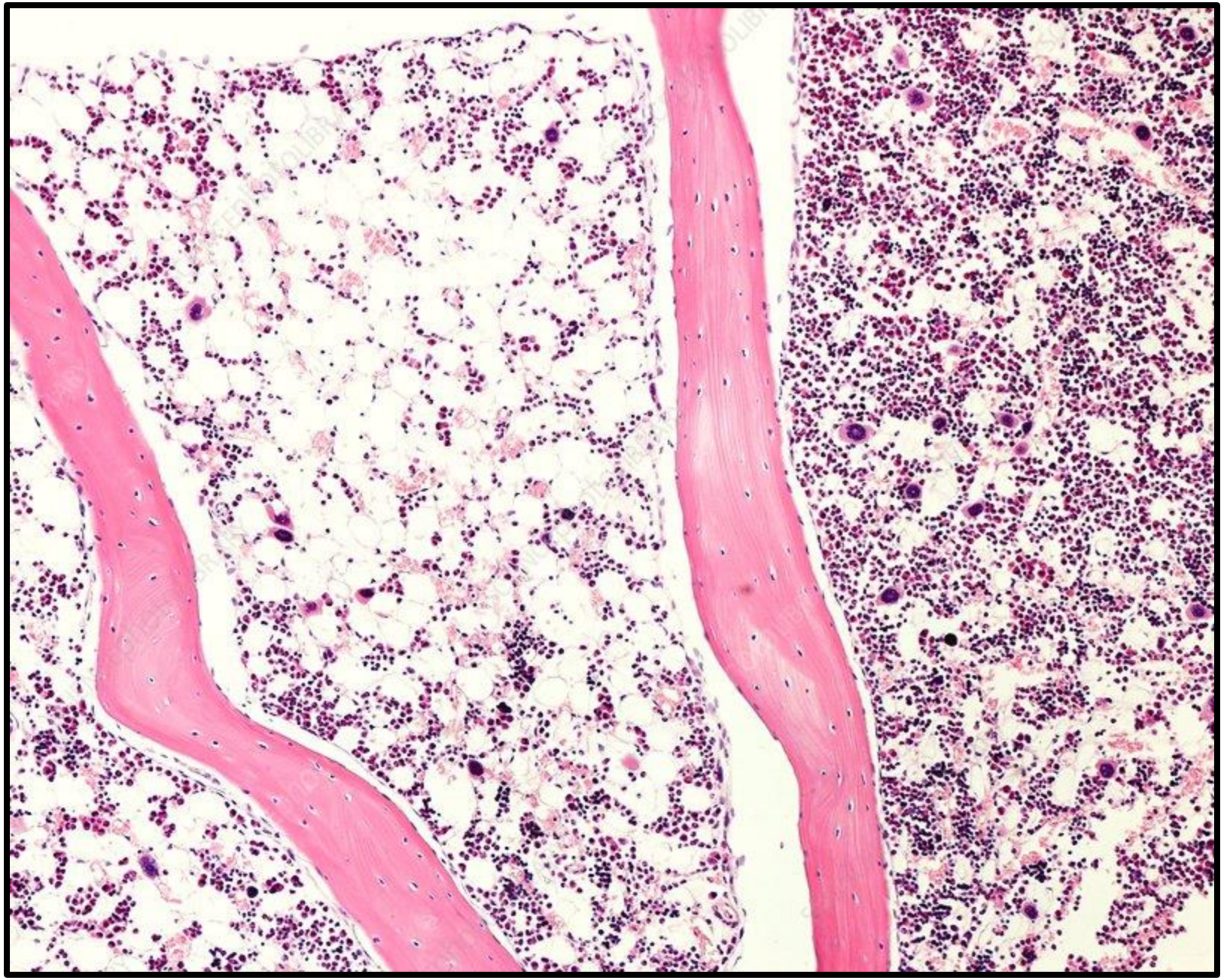


# Structure:

- 1. Stroma of fixed elements.
- 2. Large number of **fat cells**.
- 3. No free cells.



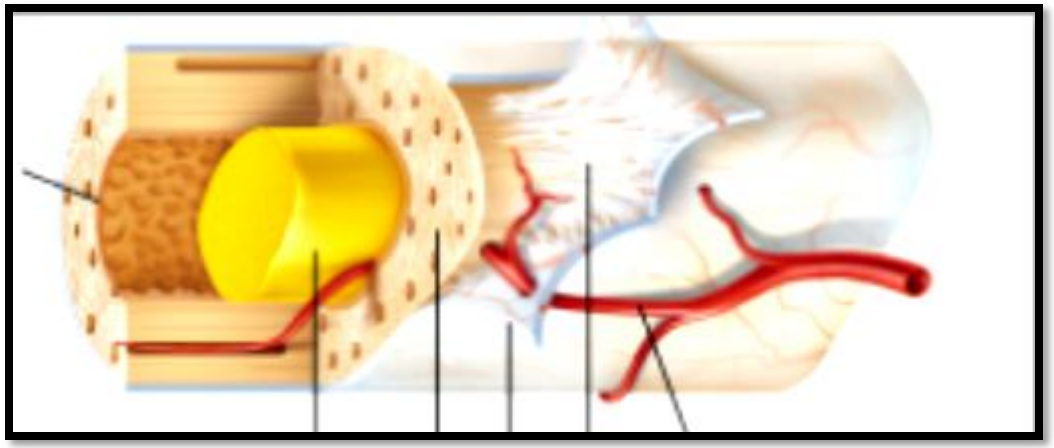
Yellow bone marrow

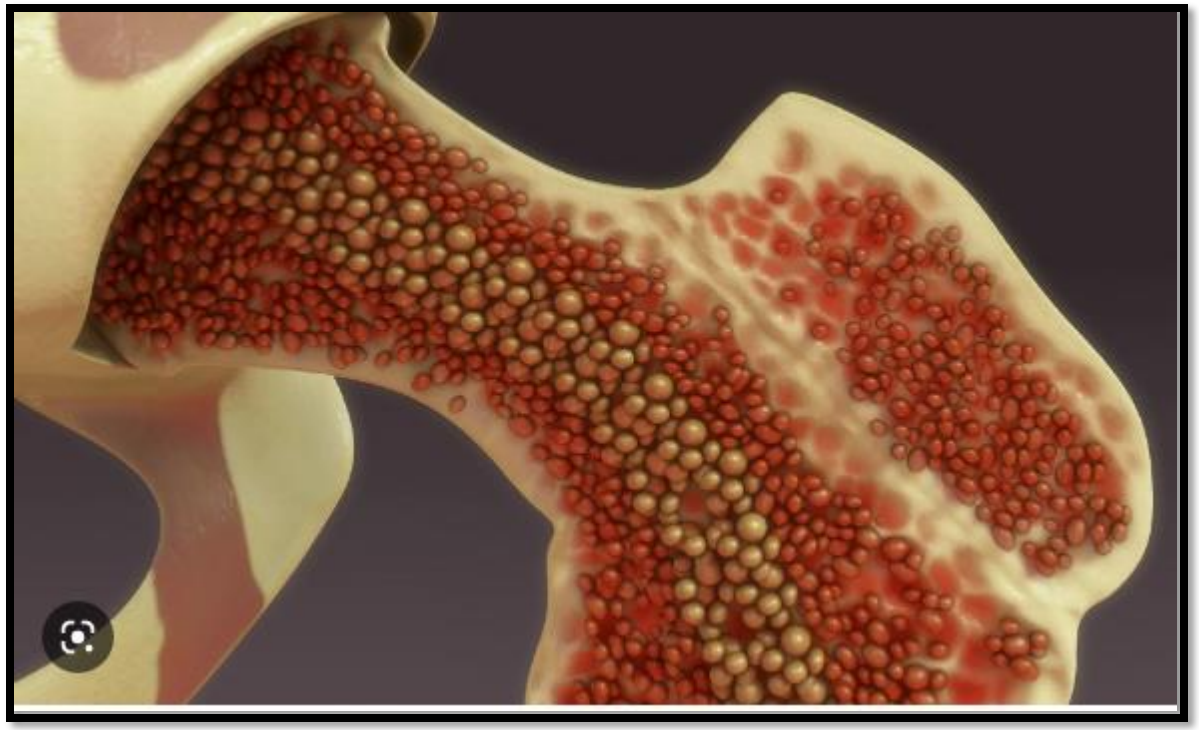


Red bone marrow

# Function

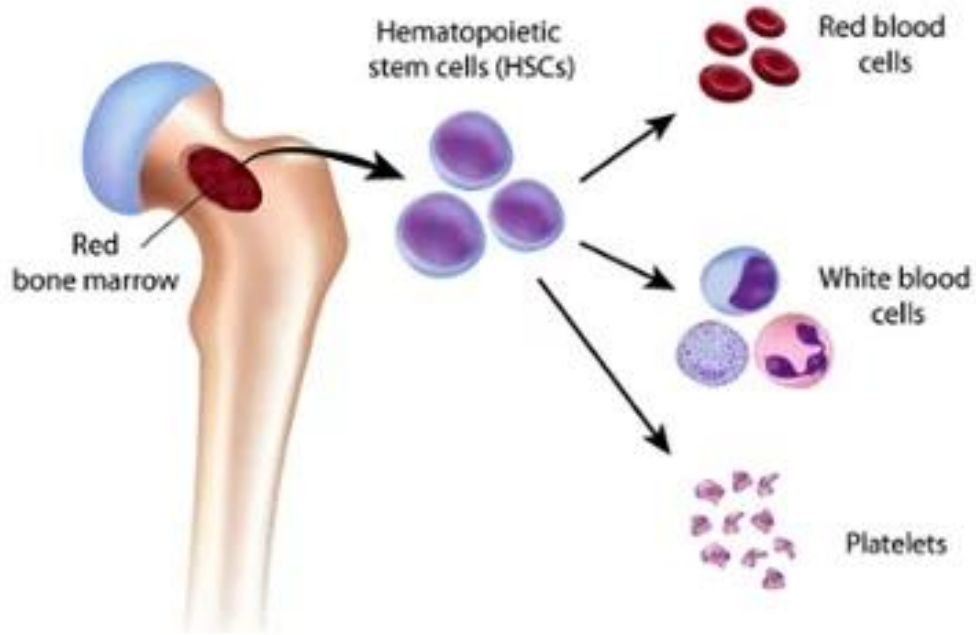
1. Storage of **fat**.
2. On need (haemorrhage and haemolysis) , changed into **active red marrow**.



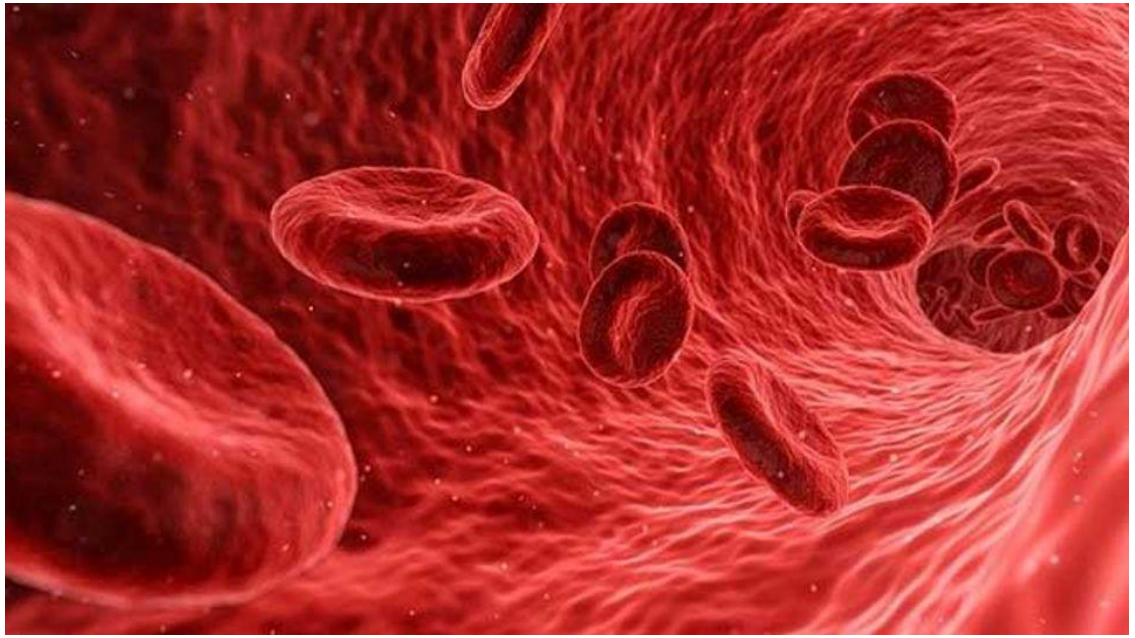


# Hematopoiesis

- It is the Development of blood cells occurring in:
  1. Bone marrow.
  2. Thymus gland.

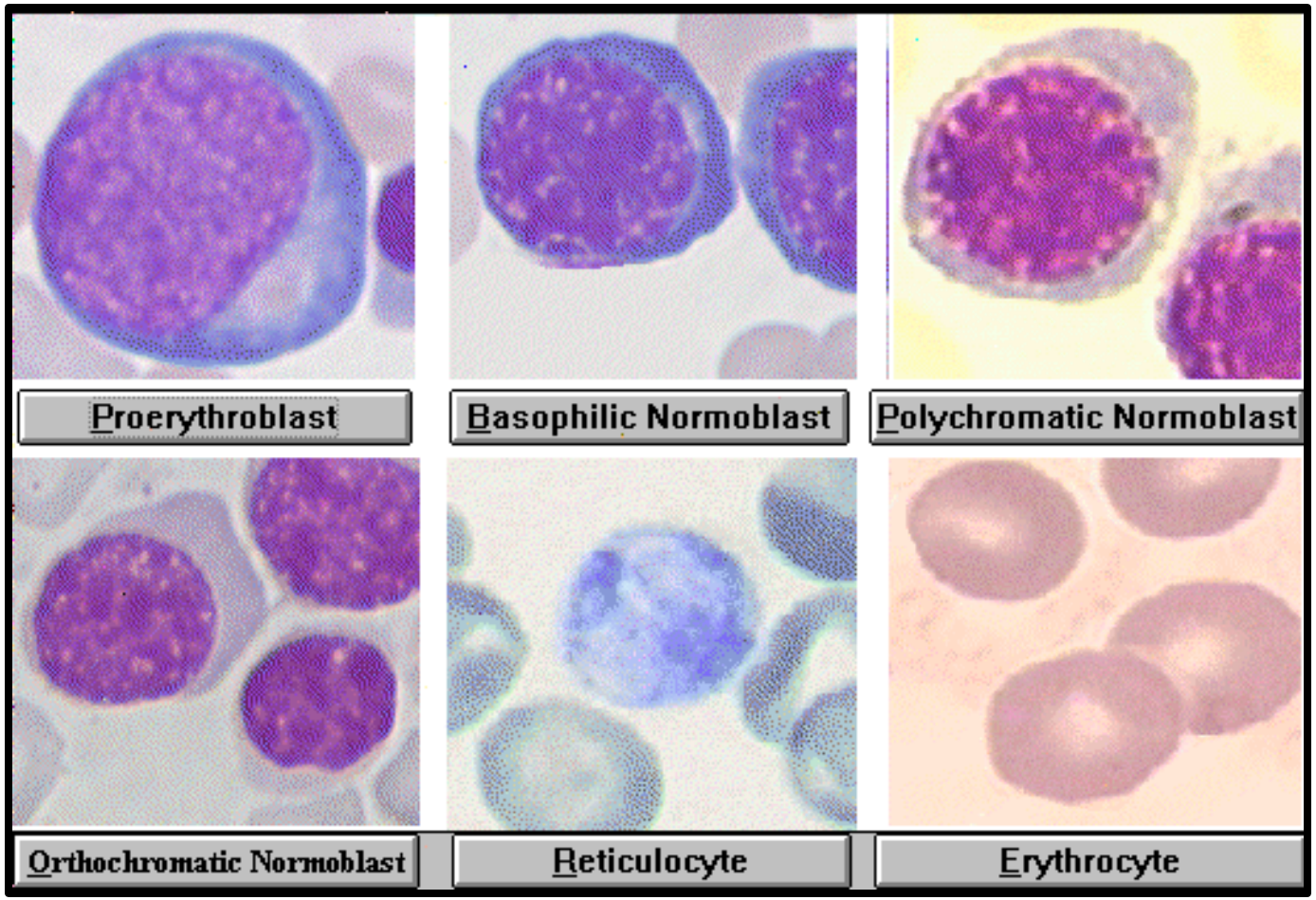


# Erythropoiesis (Development of RBCs)



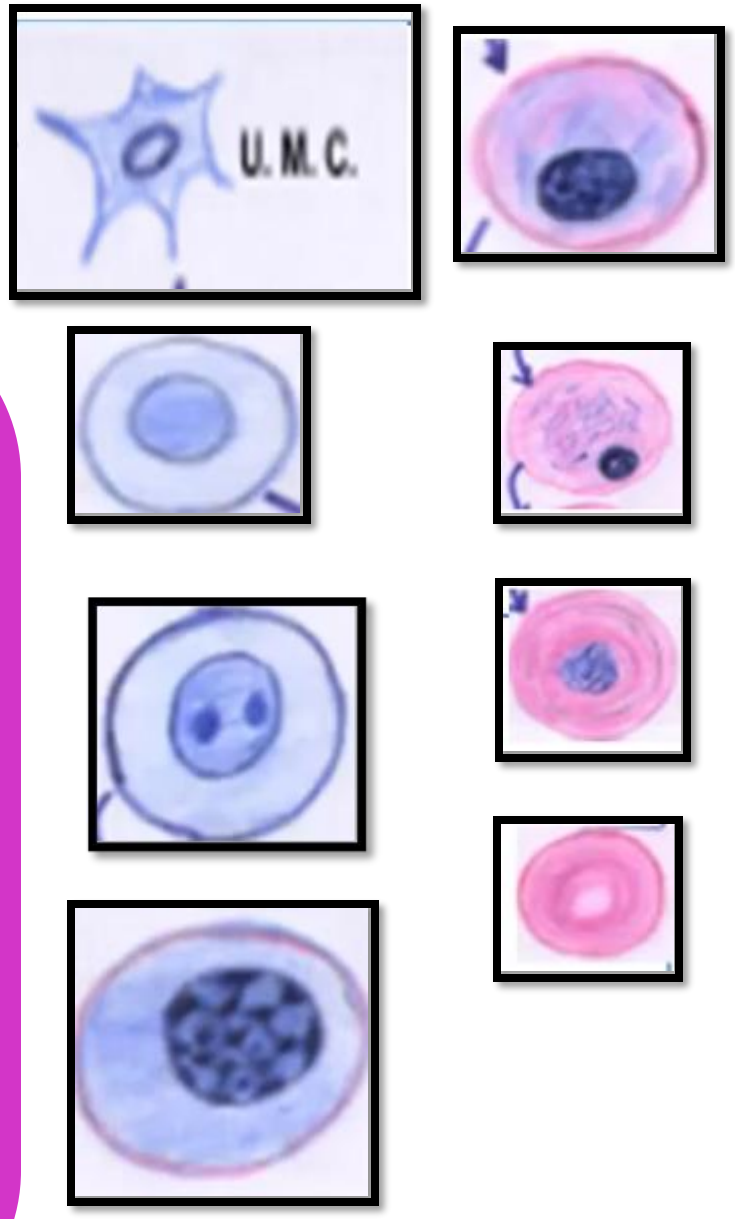
## Site

in the red bone marrow.



# Steps

- 1- Undifferentiated Mesenchymal Cells (UMC).
- 2- Colony Forming Unit (CFU) cells.
- 3- Colony forming unit erythropoietin (CFU-E).
- 4- Proerythroblasts.
- 5- Basophilic erythroblasts.
- 6- Polychromatophilic erythroblasts.
- 7- Normoblasts.
- 8- Reticulocytes.
- 9 -Mature erythrocyte.

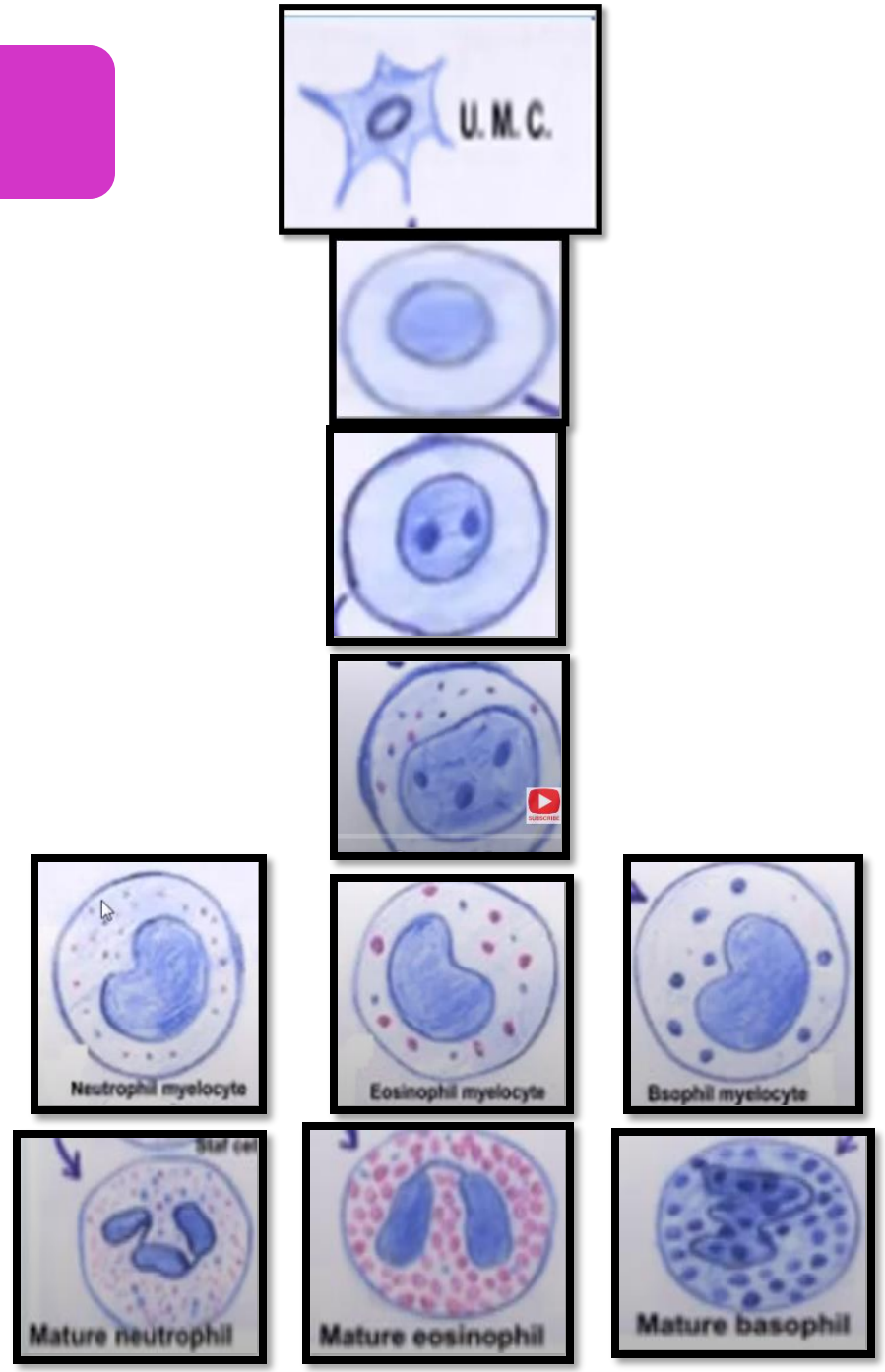


# Development of granular leucocytes (Neutrophils, Eosinophils and Basophils)

# Site: in the red bone marrow.

Steps:

- 1- U.M.C.
- 2- C.F.U.
- 3- C.F.U. granulocytes(CFUG)
- 4- Myeloblasts
- 5- Promyelocytes
- 6- Myelocytes:
- 7- Mature granulocytes



# Development of B-lymphocytes

1-U.M.C
2- colony forming cells
3-B. lymphoblast
4-B. lymphocyte.

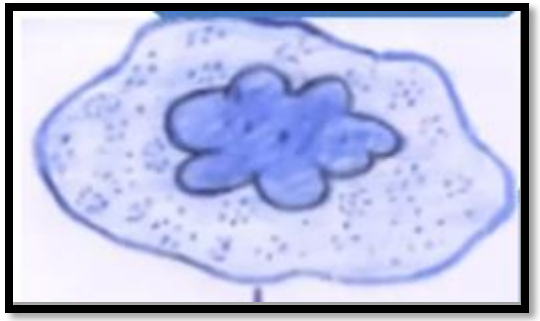
# Development of T-lymphocytes

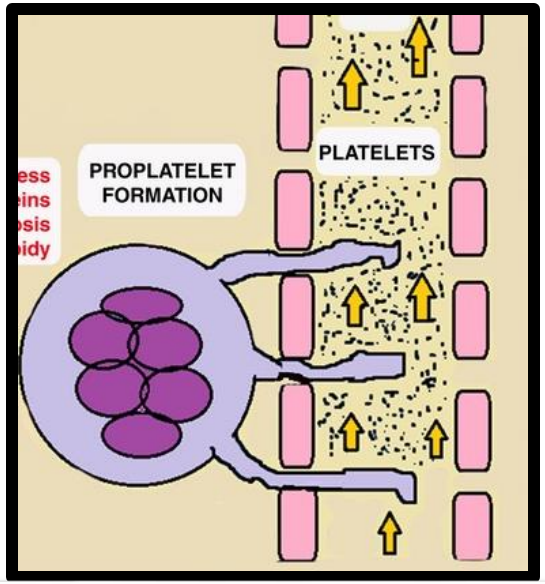
1-UMC
2-CFU which migrate to the thymus
3-T-lymphoblasts
4-T-lymphocytes.

# Development of monocytes

1-U.M.C.
2-C.F.C
3-Monoblasts
4-Monocytes

# Development of platelets






Site: in the red bone marrow.

Steps:

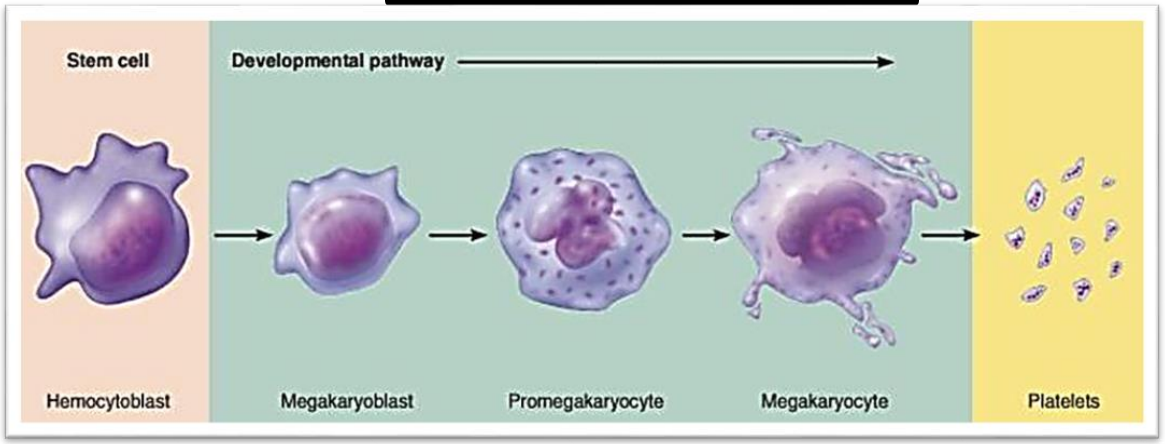
1- U.M.C

2- C.F.C.: differentiate into

3- Megakaryoblast

4- Megakaryocyte

5. Platelet formation



# References


- Junqueira LC, Carneiro J: Junqueira's Basic Histology. Text and Atlas, fourteenth edition, Copyright © 2016 by McGraw-Hill Education.
- Student medical histology book, Mansoura university.