**WEEK 3: HEMATOPOIESIS** 

# TOPIC OUTLINE

1. Morphology of Blood Cells

S.Y. '24 - '25 | SEM 1|

- a. Definition of Terms
- b. Hematopoietic System
  - Erythropoiesis

EMATOLOG

- Granulopoiesis
- Lymphopoiesis
- Megakaryopoiesis

## **1.0 HEMATOPOIESIS**

- is a continuous, regulated process of blood cell production that includes :

cell renewal proliferation Differentiation Maturation

## 1.1 EMBRYONIC/FETAL DEVELOPMENT

#### **Mesoblastic Phase**

- Begins around the 19th day of empry hic

development after fertilization

 Primitive erythrocytes the found in the volk set arise from mesod right cell
Cells from the mesoderm migrate to the volk

- Cells from the mesoderm migrate to the yolk sac

 Transient yolk sac erythroblasts are important in early embryogenesis to produce hemoglobin (Gower-1, Gower-2, and Portland)

Alpha globin chain production begins at this phase

Embryonic Hemoglobin	Globin Chain Combination
Gower I	2 epsilon 2 zeta
Gower II	2 alpha 2 epsilon
Portland	2 zeta 2 gamma

#### **Hepatic Phase**

 The hepatic phase of hematopoiesis begins at 5 to 7 gestational weeks

- characterized by recognizable clusters of developing erythroblasts, granulocytes, and monocytes colonizing the fetal liver, thymus, spleen, placenta

- The developing erythroblasts signal the beginning of definitive hematopoiesis with a decline in primitive hematopoiesis of the yolk sac

- Hematopoiesis during this phase occurs extravascularly, with the liver remaining the major site of hematopoiesis during the second trimester of fetal life

-The developing spleen, kidney, thymus, and lymph nodes contribute to the hematopoietic process during this phase.

- Thymus, the first fully developed organ in the fetus- the major site of T cell production,

- Kidney and Spleen produce B cells.
- -Detectable levels of Hb (E) and HpA is present.

Fotel 4 5 Com	Globin Chain Combination
Herotlobit	2 alpha 2 Gamma

## Medullary (Myeloid) Phase

---fifth month of fetal development, hematopoiesis begins in the bone marrow cavity.

- Hematopoietic activity, especially myeloid activity, is apparent during this stage of development, and the myeloid-to-erythroid ratio gradually approaches 3:1 (adult levels)

- Measurable levels of erythropoietin (EPO) (G-CSF), (GM-CSF), hemoglobins F and A can be detected

Adult Hemoglobin	Globin Chain Combination
Hemoglobin A	2 alpha 2 beta
Hemoglobin A2	2 alpha 2 delta