

Paper:

*hemotology*

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**Q:1Discus developmental stages of erythropoiesis**

**Answer.**

**Erythropoiesis: -**

Erythropoiesis is the process which produce red blood cells, which is the development from Erythropoietic stem cell to mature red blood cells. Is is stimulated by decreased O2 in circulation, which is detected by the kidneys, which then secrete the hormone erythropoietic.

**Proerythroblast:**

* It is the earlier erythroid element.
* In this stage basophilic cytoplasm with a perinuclear halo.
* Cytoplasm bulges to form ear shape process.
* Nuclear chromatin is not homogeneous and nucleolus is seen.

**Basophilic erythroblast:**

* In this stage the cell smaller than pro erythroblast.
* . Nuclear chromatin shows sharp contrast between light and dark areas.
* Cytoplasm is basophilic reflecting protein and RNA content.

**Polychromatophilic.**

* Polychromasia means having many colors.
* . In this stage nucleus is mature and condensed.
* And cytoplasm has a grey hue derived from hemoglobin.

**Orthochromatic erythroblast**

* The acidophilic erythroblast which is the last precursor with a nucleus.
* . Nucleus is compact and situated near the membrane. Cytoplasm is like mature red cell, reflecting a high.
* hemoglobin content.

**Reticulocyte.**

* Young erythrocytes with granular or reticular filamentous structure.
* Makes up 0.5- 2% of all erythrocytes.
* Vital staining required to make this visible.
* Reticulocytotic seen following hemolysis or acute blood loss

**Mature non-nucleated erythrocytes:**

* These are reddish, circular and biconcave cells.
* Their size is 7-8 micrometer
* In these there is no visible internal structure.
* In these cells’ high hemoglobin content.
* These are bright at center due to biconcave shape.

**Q:2 enlist common causes of poor blood filum (blood smear).**

**Answer.**

* Drop of blood too large or too small
* Spreader slide pushed across the slide in a jerky manner Failure in keep the entire edge of the spreader slide against the slide while making the smear
* Failure in keep the spreader slide at a 30" angel with the slide
* Failure to push the spreader slide completely across the slide
* Irregular spread with ridges and long tail: edges of spreader dirty or chipped; dusty slide
* Holes in film—slide contaminated with fat or grease and air bubbles
* Cellular degenerative changes: delay in fixing inadequate fixing time or methanol contaminated with water.

**Q:4 What Is iron deficiency Anemia? Also discuss its causes**

**Answer.**

**Anemia**

Anemia is a condition that develops when your body lacks enough healthy red blood cells or hemoglobin.

**iron deficiency Anemia**

-As the name implies, iron deficiency anemia is due to insufficient iron.

-Without enough iron, the body can't produce enough hemoglobin, a substance in red blood cells that enables them to carry oxygen.

-As a result, iron deficiency anemia may leave an individual tired and short of breath.

**discuss its causes**

**Increased physiological demand**

Infancy, adolescence, menstrual blood loss, pregnancy (second and third trimesters), blood donation

**Environmental factors**

Insufficient iron uptake (due to poverty, malnutrition and diet)

**Pathological decreased absorption**

Gastronomy, duodenal bypass, bariatric surgery, Helicobacter pylori infection, celiac disease, atrophic gastritis, inflammatory bowel diseases (e.g. Crohn's disease)

**Drug-related**

Glucocorticoids, aspirins, NSAIDs, proton-pump inhibitor

**Genetic**

TMPRSS6 genetic mutation

**iron-related erythropoietic**

Treatment with erythropoiesis-stimulating agents, anemia of chronic disease, chronic kidney disease

**Q:3. Briefly explain Granulopoiesis in detail.**

***Answer: -* Granulopoiesis: -**

Granulopoiesis is a part of haematopoiesis, that leads to the production of granulocytes. Also referred to as polymorphonuclear lymphocytes.is a type of white blood cell that has multi lobed nuclei, usually containing three lobes and has a significant number of cytoplasmic granules within the cell.

**Formation of Neutrophils: -**

1. **Myeloblast: -**

* An early precursor cell, diameter 15-20um, lower nuclear cytoplasmic ratio, no cytoplasmic granules.
* Large cell with a large nuclear and which demonstrates basophilic staining. This stage exists for all granulocytes.

1. **Promyelocytes: -**

* Is the next stage of maturation, similar in size and appearance to myeloblast?
* During this stage primary (azurophilic) granules are formed. This stage exists for all granulocytes.
* Has numerous azurophilic primary granules in cytoplasm, that contain variety of enzymes.

1. **Myelocyte*: -***

* Secondary granules become apparent.
* Increased size and smaller primary granules.
* Secondary granules have several bactericidal enzymes.
* Nucleus becomes indented.

1. ***Metamyelocytes: -***

* Next stage in myelopoiesis is a cell having more indented and smaller nucleus and having more granules.

1. ***Mature neutrophils: -***

* Arise from stem cells in approx. 10 days. Remain viable in systemic circulation for 8–12 hrs.

**Q:5. Classify anemia on the basis of morphology with examples.**

Answer

**Anemia**

A decrease in hemoglobin level (or total circulating red cell mass) for the age and sex of a person is called as anemia.

**CLASSIFICATION**

On the basis of morphology and with regard of red cell indices we can classify the anemia into following.

1. **Microcytic Hypochromic anemia**

In this type of anemia individual RBCs are smaller in size than normal and contain a subnormal amount of hemoglobin.

This type of anemia is commonly seen in following

* Iron deficiency
* Thalassemia
* Sideroblastic anemia
* Anemia of chronic disorders

2. **Macrocytic Anemia**

In this type of anemia individual RBCs are larger than normal, but the amount of hemoglobin in each cell is usually below normal.

Examples are.

* Megaloblastic anemia
* Aplastic anemia
* Hemolytic anemia
* Liver disease
* Myxedema
* Hypopituitarism
* Pregnancy
* Alcoholism

3. **Normocytic Normochromic Anemia**

In this type of anemia, although the hemoglobin concentration in the blood is reduced, the individual RBCs appear normal and absolute values are also within normal limits.

**Examples are.**

* Acute blood loss
* Leukemia
* Bone marrow infiltration
* Chronic renal failure
* Chronic infections (chronic disorders)