مورفولوژی گلبولهای قرمز:

Size of normal red cells:

۷,۵micrometers(mm)in diameter.

Characteristics of normal RBC:

Central concavity and pallor

Variation in size of RBC's is called **Anisocytosis** and is encountered in

- Megaloblastic anemia
- Iron deficiency anemia

Variation in shape:

Abnormal shapes of red blood cells is called **Poikilocytosis** and is encountered in:

- Megaloblastic anemia
- Iron deficiency anemia

Microcytic and Hypochromic: Smaller than normal with prominent central pallor

- Iron deficiency anemia Causes include: Blood loss Pregnancy
- Impaired GI absorption
- Beta Thalessemia
- Sideroblastic anemia

Macrocytic: Larger than normal

- Chronic hepatic disorders, i.e. cirrhosis, chronic hepatitis
- Alcoholism
- Hypothyroidism
- Megaloblastic anemia (Vitamin B ۱۲or folate deficiencies)
- Myelodysplasia

Sickle Cells: Elongated crescentic red blood cells

- Sickle cell hemoglobinopathies (e.g.SS,SC, S-thalassemia)
- Rarely seen in sickle trait(AS)smear.

Elliptocytes: Cells are elliptical in shape.

- Hereditary elliptocytosis
- Thalassemia
- Iron Deficiency

Target Cells: Central and outer rim staining with intervening ring of pallor

- Liver disease
- Thalessemia
- Hemoglobin C disease
- Sickle cell disease

Acanthocytes: Also called Spur cells Irregularly spiculated . Dense center.

- Due to altered cell membrane lipids
- Severe liver disease
- Abetalipoproteinemia
- Rarely seen in anorexia nervosa
- MalabsorptionPost
- Splenectomy

Polychromatophilia: Reticulocytes: Blue hue in macrocytes

- Hemolytic anemia
- Thalassemia Major
- Autoimmune
- Hemolysis
- Hemorrhage
- After replacement of Iron, B۱۲, Folate

Rouleaux Formation: Alignment of red blood cells in stacks (more than ٤-٥per stack)

- Paraproteinemia as in multiple myeloma ormacroglobulinemia
- High fibrinogen (inflammatory states; high ESR)
- Artifactual
- Howell jolly bodies : small basophilic dense inclusion
- Post Splenectomy
- Hemolytic anemia

Spherocytes: Small hyperchromic cells lacking normal central pallor

- Hereditary spherocytosisImmune hemolytic anemia
- Post transfusion
- Glucose-٦-phosphate dehydrogenase deficiency(Heinz body hemolytic anemias)