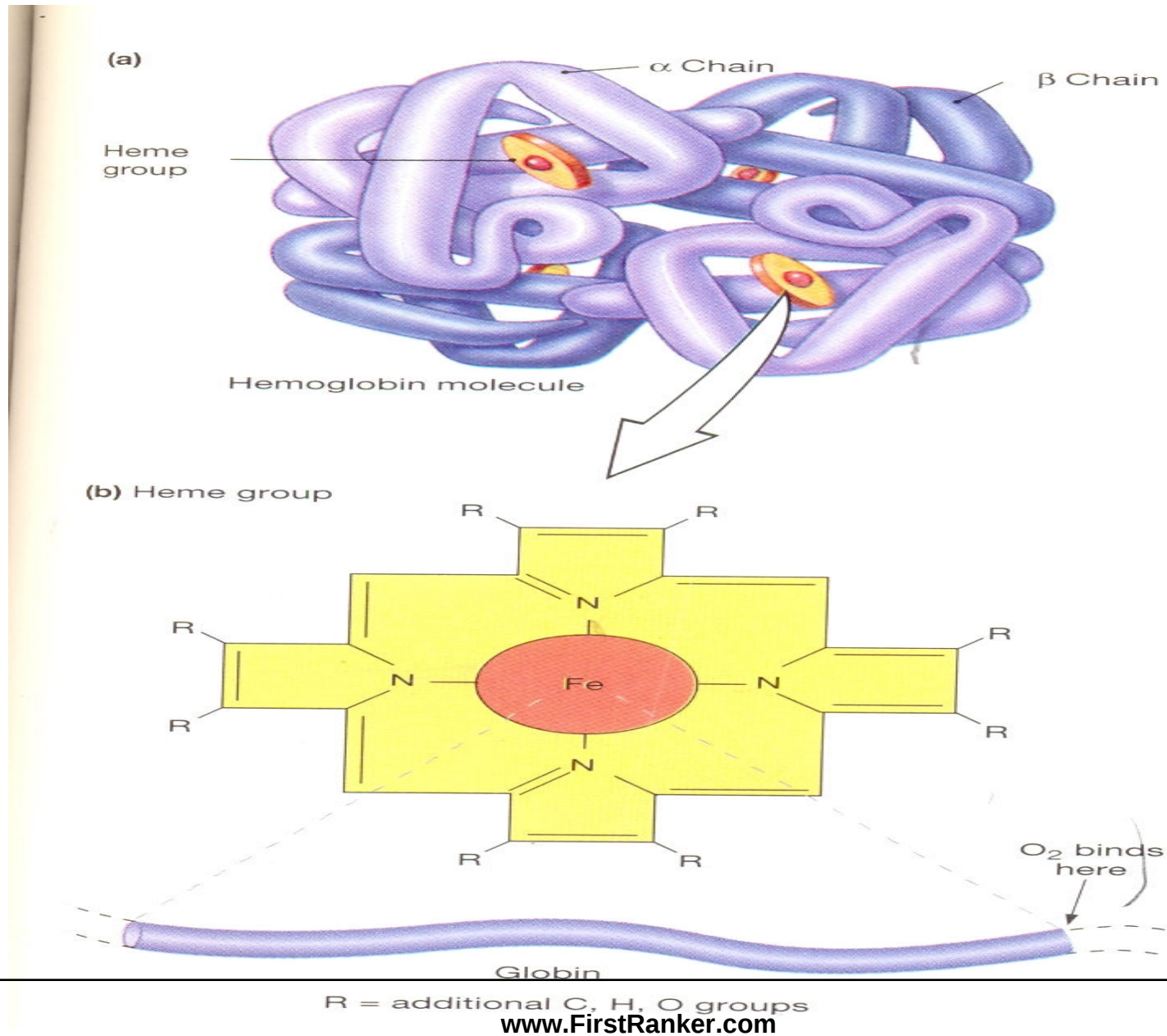
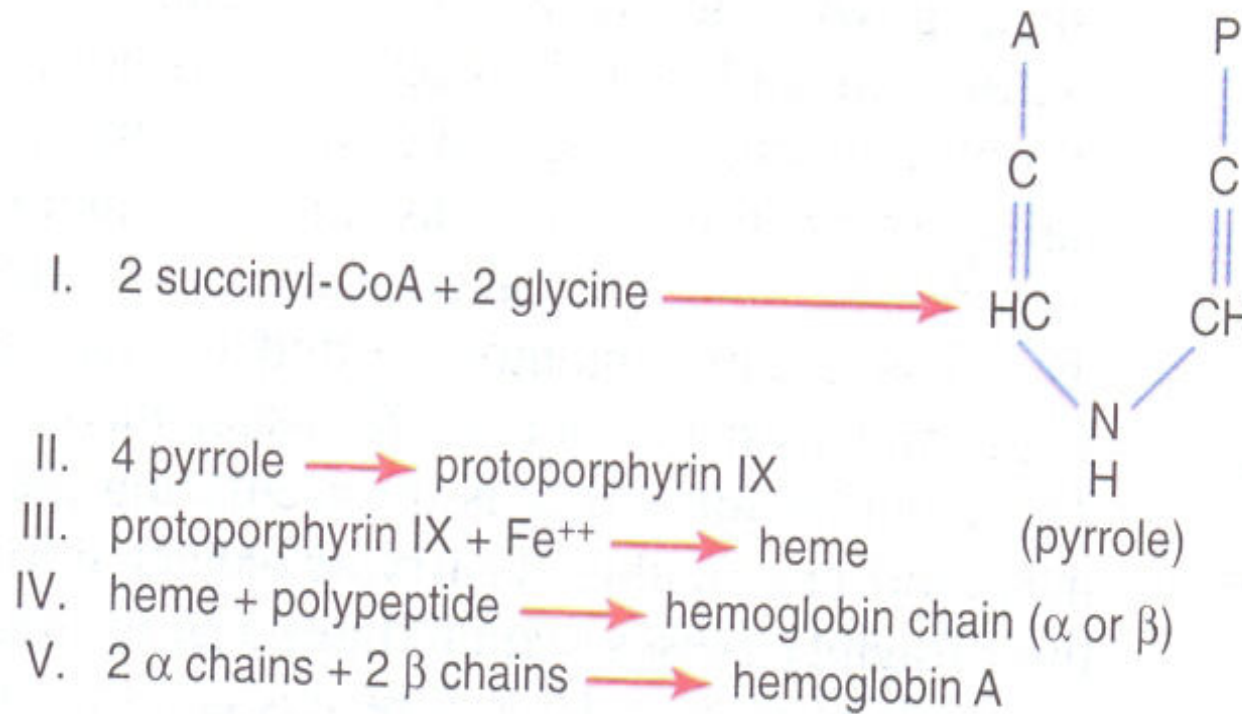




Synthesis of Hemoglobin

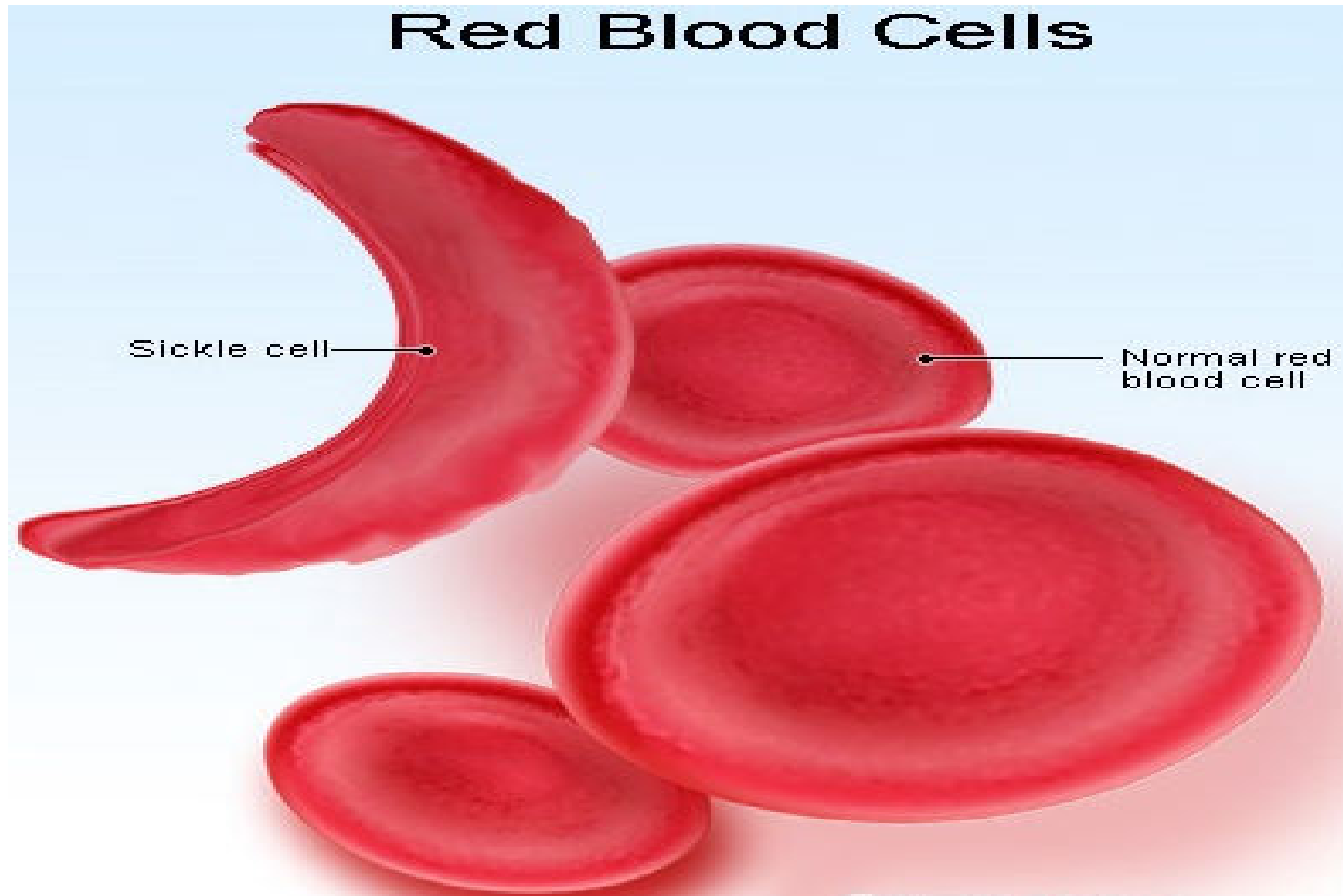


Types of Haemoglobin

- HbA (Alpha2 Beta2)
- HbA2 (Alpha2 Delta2)
- Hb A1c
- HbF (Alpha2 Gamma2)
- Gower I (Zeta2 Eeta2)
- Gower II (Alpha2 Eeta2)
- Met Hemoglobin
- Hb S

Sickle Cells

Red Blood Cells



Reactions of Hemoglobin

- Combine with O₂
- Combine with CO₂
- Combine with CO
- Combine with NO
- Combine with H⁺ ions

Anemia

Deficiency of haemoglobin content in the blood which can be caused by either too few RBCs or too little Hb in the cell for the age and sex of a patient.

Types of Anemia

Accelerated red blood cell loss

Blood loss: Cells are normal in size and hemoglobin content but low in number

Hemolytic anemias: Cells rupture at an abnormally high rate

Hereditary

- Membrane defects (example: hereditary spherocytosis)

- Enzyme defects

- Abnormal hemoglobin (example: sickle cell anemia)

Acquired

- Parasitic infections (example: malaria)

- Drugs

- Autoimmune reactions

Decreased red blood cell production

Defective red blood cell or hemoglobin synthesis in the bone marrow

- Aplastic anemia:* Can be caused by certain drugs

- Inadequate dietary intake of essential nutrients*

 - Iron deficiency (iron is required for heme production)

 - Folic acid deficiency (folic acid is required for DNA synthesis)

 - Vitamin B₁₂ deficiency (vitamin B₁₂ is required for DNA synthesis)

Inadequate production of erythropoietin



(a)

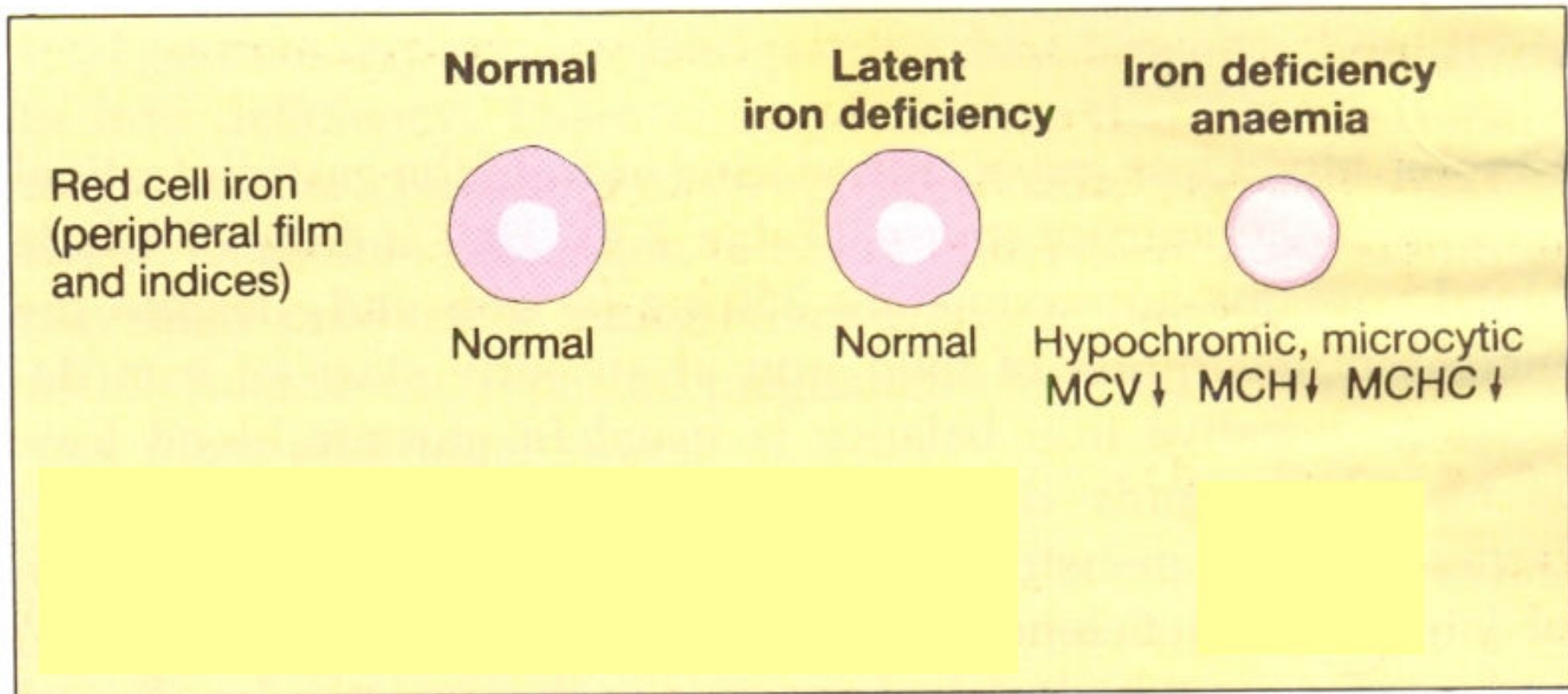


(b)

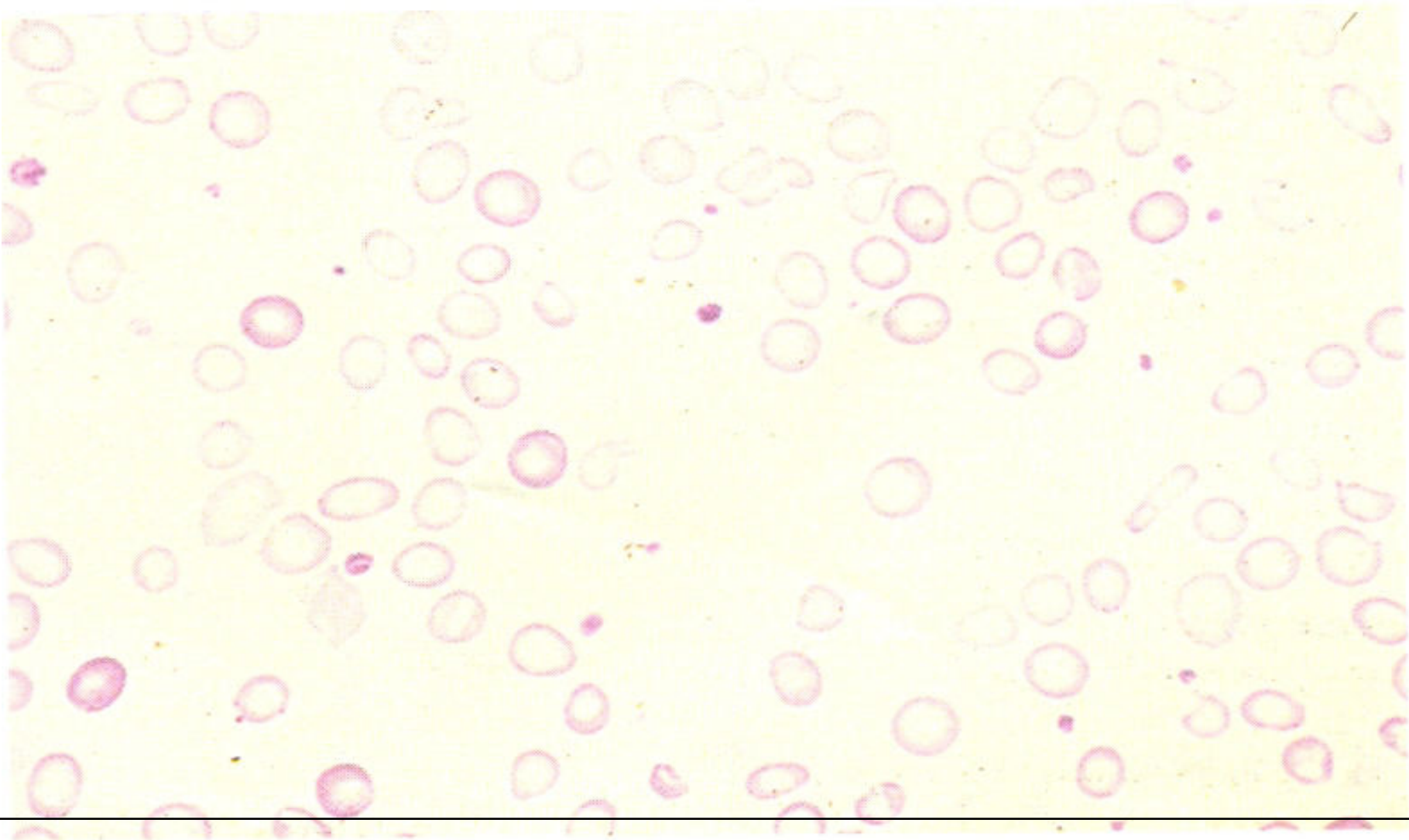
Symptoms of Iron Deficiency Anemia

- Koilonychia
- Angular cheilitis

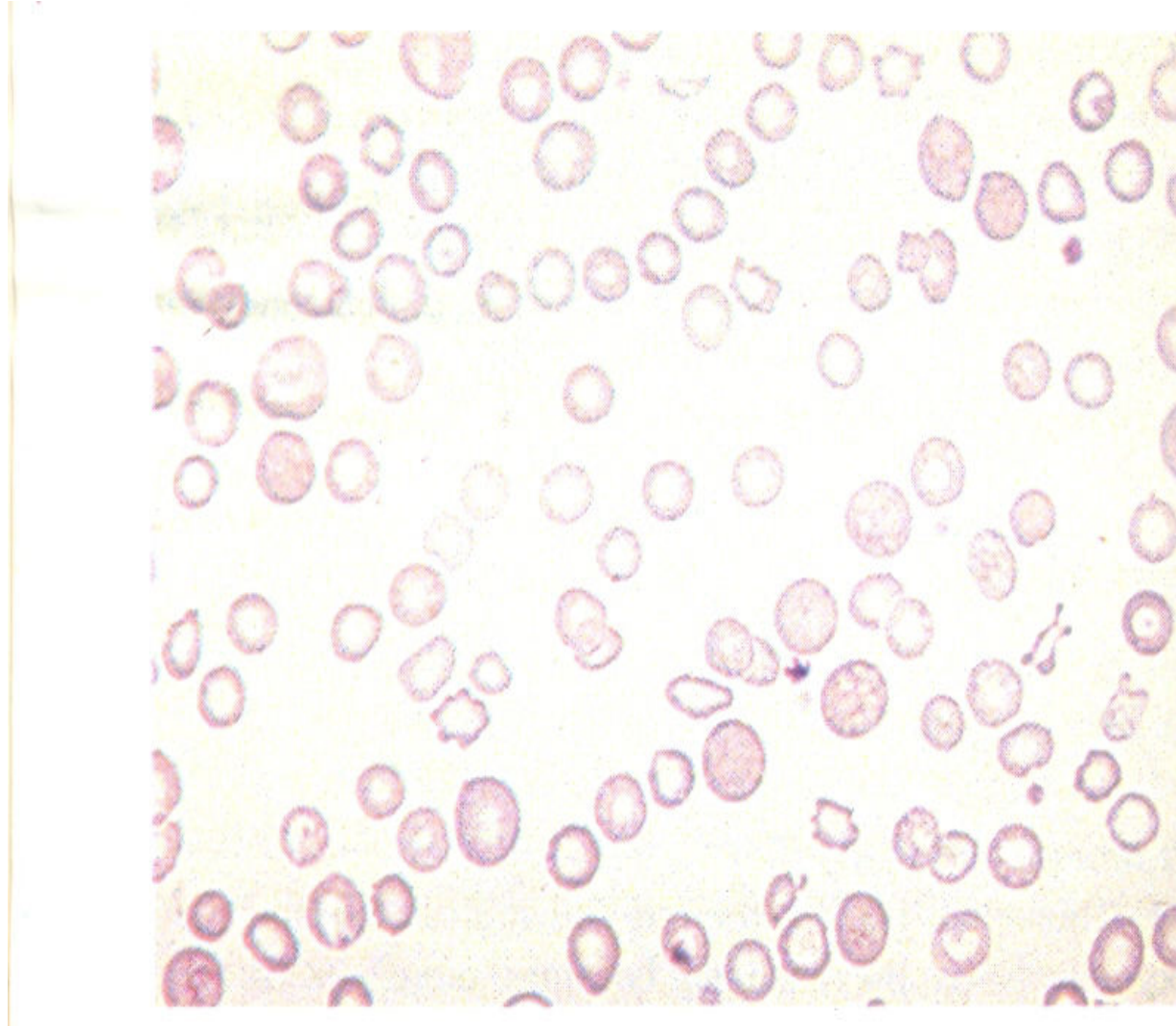
The Development of Iron Deficiency Anemia



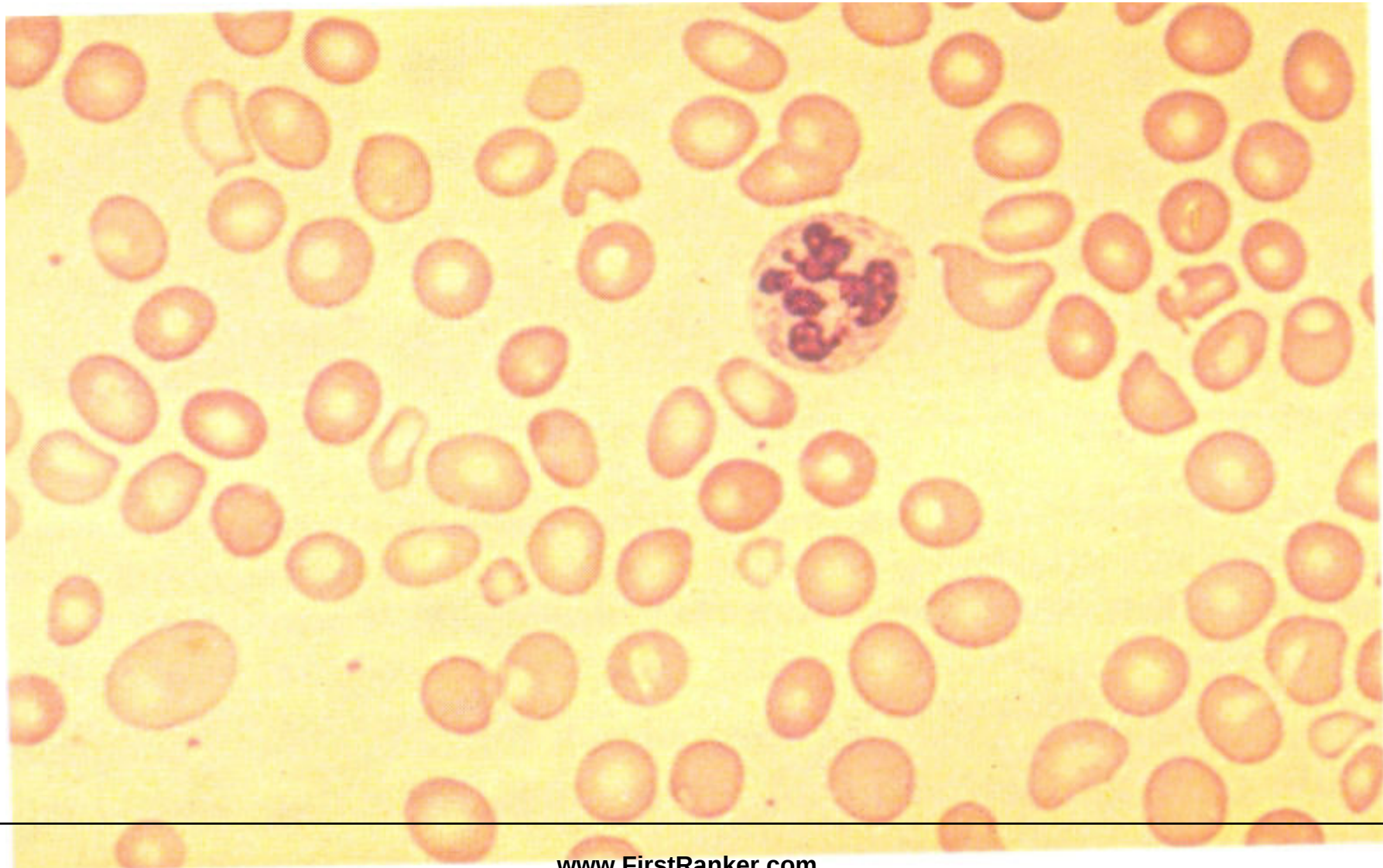
Peripheral Blood Film Showing Iron deficiency Anemia



Dimorphic blood film in Iron deficiency anaemia responding to Iron therapy



Peripheral Blood Film Showing Megaloblastic Anemia



Inherited Disorders of Hemoglobin

- Hemoglobinopathies e.g Sickle cell anemia
- Thalassemias e.g Alpha and Beta

