

Hemoglobin Formation

- Synthesis of hemoglobin begins in the proerythroblasts and continues even into the *reticulocyte stage* of the RBCs. Therefore, when reticulocytes leave the bone marrow and pass into the blood stream, they continue to form minute quantities of hemoglobin for another day or so until they become mature erythrocytes.

- The basic chemical steps in the formation of hemoglobin:

1. Succinyl-CoA, formed in the Krebs metabolic cycle, binds with glycine to form a pyrrole molecule.
2. Four pyrroles combine to form protoporphyrin IX,
3. Protoporphyrin IX then combines with iron to form the heme molecule.
4. Finally, each heme molecule combines with a long polypeptide chain, a globin synthesized by ribosomes, forming a subunit of hemoglobin called a hemoglobin chain. (02 α + 02 β chains=Hb A)
5. Each chain has a molecular weight of about 16,000; four of these in turn bind together loosely to form the whole hemoglobin molecule

95-98% Hb are Hb A and remaining 2-3% are Hb A2 (formed by 2 α and 02 delta chains)

