In vitro synthesis of radioactive labeled globin chains in affected individuals reveals the following:

- $\beta^0$-thalassemia: a complete absence of globin beta chains and a marked excess of globin alpha chains compared with globin gamma chains. The $\alpha/\gamma$ ratio is greater than 2.0.

- $\beta^+$-thalassemia: a variable degree of reduction of globin beta chains resulting in severe (thalassemia major) to mild (thalassemia intermedia) clinical phenotypes. The imbalance of the $\alpha/\beta$ and $\gamma$ ratio is similar to that in $\beta^0$-thalassemia major.