

Thesis Title	Characterization of Hemoglobin J-Buda and Hemoglobin G-Coushatta in Thailand
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ABSTRACT

Two abnormal hemoglobins have been characterized for the first time in Thailand. One, **Hb J-Buda**, was found in a twenty-eight year-old female of Thai extraction. Normal hematological data was observed except for slightly low levels of Hb, Hct, MCV and MCH. Physical examination showed that she was healthy. Hemoglobin typing by cellulose acetate electrophoresis under native conditions showed Hb A and an abnormal hemoglobin band migrating between Hb A and Hb Bart's. The abnormal hemoglobin was further isolated by DEAE-cellulose column chromatography and the abnormal α -chain was purified by CM-cellulose column chromatography. The abnormal α -chain ($\alpha^{L.K}$) was subjected to tryptic peptide mapping by HPLC in comparison to α^A chain. Amino acid analysis and sequencing analysis showed the change α 61 Lys \rightarrow Asn in peptide α Tp 9. The same structural change has been found in a Hungarian family and named Hb J-Buda. Direct DNA sequencing of the proposita's DNA showed the substitution of G to T at codon 61 (**AAG** \rightarrow **AAT**) of the α -1 globin gene, which is in agreement with protein sequencing results.

The other abnormal hemoglobin, **Hb G-Coushatta**, was found in a forty-year-old female of Thai extraction. Hematological data indicated slightly low levels of Hb, RBC, Hct, MCH and MCHC. Physical examination showed that she was healthy and pregnant. Hemoglobin typing by cellulose acetate electrophoresis under native conditions showed Hb A and an abnormal hemoglobin band migrating between Hb A₂ and Hb F. The abnormal hemoglobin was further isolated by DEAE-cellulose column chromatography and the abnormal β chain was purified by CM-cellulose column chromatography. The abnormal β -chain (β^{AB}) was subjected to tryptic peptide mapping by HPLC in comparison to β^A chain. Amino acid analysis and sequencing analysis showed the change $\beta 22$ Glu \rightarrow Ala in peptide β Tp 3. The same structural change has been found in North American Indians (Hb G Coushatta), in a few descendents of Santee Indians in Canada (Hb G Saskatoon), and in the Chinese (Hb G Hsin-Chu and Hb G Taegu). Direct DNA sequencing of the proposita showed the substitution of A to C at codon 22 (GAA \rightarrow GCA) of the β -globin gene, which is in agreement with protein sequencing results. Haplotype analysis of the β -globin gene cluster was also performed, and the β^G gene of the proposita was found to have the 5' haplotype (+, -, -, -, -) and the 3' framework (+, -).