

Hemoglobin and *HFE* gene polymorphisms in Brazilian populations in regions endemic for malaria

(Estudo do polimorfismo de hemoglobinas e do gene *HFE* em populações brasileiras de áreas endêmicas de malária)

Felipe Rafael Torres

2005. Instituto de Biociências, Letras e Ciências Exatas, Universidade Estadual Paulista “Júlio de Mesquita Filho”, São José do Rio Preto, SP, Brasil. Ph.D. thesis. 157p. Orienting Professor: Dr. Claudia Regina Bonini-Domingos

Our objective was to determine how the distribution of red blood cell diseases is related to malaria occurrence in north Brazil, a region endemic for malaria. We evaluated the incidence of two mutations in the *HFE* gene, H63D and C282Y, in two study groups: a control blood donor group, with no indication of malaria infection, and a group constituted of malaria patients of four states of the Amazonian region. The hemoglobin polymorphisms were obtained by HPLC and classical laboratory methodologies, and the two mutations in the *HFE* gene were assayed by PCR-RFLP. We found a high frequency of alpha thalassemia, but there were no significant differences between blood donors and malaria patients. There were also no significant differences in the frequencies of HbA₂; however, the frequency of HbF was significantly different in individuals with malaria from Pará and Rondônia. The mean number of reticulocytes was significantly reduced in the blood donors from the northern region, suggesting an adaptive strategy of these populations to parasitic attack by *Plasmodium*. Most individuals were heterozygous for the H63D allele of the *HFE* gene in both study groups. In the blood donors group, the greatest frequency of the H63D allele was found in Caucasians of all the states. In the malaria patients group in Rondônia, there was a high frequency of the H63D allele among the non-Caucasians. In the other states, and in the malaria patients group, the H63D allele was the most frequent among the Caucasians. Based on our results, we suggest that the maintenance of polymorphism

of the mutations in the gene *HFE* can be explained by selective factors other than malaria, or it is due to simple allelic oscillation and by the constant gene flow among the populations in Brazil.

Key words: Hemoglobin polymorphism, Hereditary hemochromatosis, *HFE* polymorphism, Allelic frequency, Malaria