IMMUNOGENICITY OF PvVir14-DERIVED PEPTIDES TO IMPROVE THE SEROLOGICAL DIAGNOSIS OF *Plasmodium vivax* INFECTION

Ana Rafaela Antunes Porto[1], Ramayana Morais de Medeiros Brito[1], Raianna Farhat Fantin[2,3], Ana Laura Grossi de Oliveira[1], Isabela de Brito Duval[1], José Bryan da Rocha Rihs[1], Renata Maria Costa Souza[3], Lilian Maria Lapa Montenegro Pimentel[3], Ricardo Toshio Fujiwara[1], Lilian Lacerda Bueno[1]

[1]Federal University of Minas Gerais, Minas Gerais, Brazil.

[2]Icahn School of Medicine at Mount Sinai, New York, NY, USA.

[3]Fiocruz-PE, Recife, Pernambuco, Brazil.

Malaria, caused by *Plasmodium* parasites, is a major public health issue, with *P. vivax* responsible for 90% of cases outside Africa. The differential diagnosis is crucial for the correct treatment. The Vir superfamily proteins of *P. vivax* relate to virulence and PvVIR14 circulates during the infection. This study assessed the reactivity of peptides derived from PvVIR14 and their potential as targets for a diagnosis test. We analyzed serum of 135 individuals from an endemic area of *P. vivax* malaria, and 153 from a non-endemic area with an outbreak of *P. vivax* malaria, categorized as infected and exposed. ELISA assays were performed to determine the presence of specific IgG and IgM against the protein and its derived peptides and a depletion ELISA identified the immunodominant peptides. In the endemic area, IgM reactivity to PvVir14, L06, H08, and G08 was observed in 27.3%, 22.2%, 10.2%, and 14.5% of *P. vivax*-infected individuals, respectively, while IgG reactivity was 72.2%, 80%, 68.1%, and 58.6%, respectively. IgM reactivity for PvVir14 was 33.3% for the exposed individuals and 29.3% for those who had two or more cases of malaria. Among individuals experiencing their first episode of malaria, the frequency of IgM reactivity was higher for the peptides L06 and G08. The frequency of specific IgG against PvVir14 and the three peptides was higher in individuals with the first or multiple cases of malaria. In the non-endemic area the highest IgM reactivity was found for the peptides H08 and G08 and IgG anti-PvVIR14 was detected in 20,3% of the individuals. The three peptides showed sensitivity and specificity above 80% for infected individuals against healthy controls and PvVIR14 was better in differentiation of

infected and exposed individuals. Moreover, the peptides exhibited immunodominance over the protein. These results represent an important perspective for developing new tools for the differential diagnosis of *P. vivax* malaria.

Supported by: FAPEMIG, CNPq

Keywords: *Plasmodium vivax*, PvVir-14, diagnosis