CHARACTERIZATION OF A CHIMERIC RECOMBINANT PROTEIN BASED ON THE VACCINE CANDIDATES PvCyRPA, PvRipr AND PvGAMA AND EVALUATION OF ITS POTENTIAL AS A VACCINE CANDIDATE AGAINST ERYTHROCYTIC FORMS OF *P. vivax*.

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P. vivax is one of the most difficult *Plasmodium* species to eliminate and represents a major public health challenge, especially in countries like Brazil. In this scenario, the development of vaccines with chimeric recombinant proteins can contribute to malaria control. However, specific *P. vivax* antigens under investigation are still scarce. The proposal of this work is to develop a chimeric recombinant protein containing multiple blood-stage epitopes selected from molecular, biochemical and immunological aspects of PvCyRPA, PvRipr and PvGAMA proteins. Therefore, plasma and PBMCs from 300 Brazilian Amazon individuals with previous malaria episodes were used in ELISA (IgM, IgG and subclasses) and ELISPOT (INF-γ) assays. *In silico* prediction of B and T cell epitopes was performed in all proteins. The results showed that PvCyRPA and PvRipr are naturally immunogenic (22.2% and 35% of individuals with IgM antibodies, 56.7% and 44% of individuals with IgG antibodies against recombinant proteins, respectively). PvCyRPA had a higher frequency of IgG1 responders (70.6%), while PvRipr had similar frequencies of IgG1, IgG2 and IgG4 (46%, 44% and 50%, respectively). A total of 7 B cell epitopes were found in PvCyRPA, 4 epitopes in PvRipr and 3 epitopes in PvGAMA. The most promising epitopes were T312-G330-PvCyRPA (39.2% of responders), K879-G888-PvRipr (47%) and P497-T505-PvGAMA (26%). A total of 10 T cell epitopes were identified in PvCyRPA and used in Elispot assays. Pools containing E306-K320 were able to induce more INF-γ SFUs in the exposed group (43 and 29.75/250,000 cells for pools 4 and 5, respectively). In PvCyRPA the most promising B and T epitopes overlapped in 9 amino acids. As a preliminary conclusion, the proteins have already confirmed epitopes, inserted in promising regions in other *Plasmodium* species. The observed humoral and cellular immune responses reinforce their potential as vaccine candidates, especially as a chimeric recombinant blood-stage protein.

Keywords: *P. vivax,* recombinant chimeric protein and vaccine.

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