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IMMUNOGENICITY AND PROTECTIVE EFFICACY OF THE MEROZOITE SURFACE PROTEIN-3 (MSP-3) AND THE GLUTAMATE-RICH PROTEIN (GLURP) OF PLASMODIUM FALCIPARUM IN THE NEW WORLD PRIMATES SAIMIRI SCIUREUS AND AOTUS INFULATUS

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Two Plasmodium falciparum proteins, the Merozoite Surface Protein-3 (MSP-3) and the Glutamate-Rich Protein (GLURP), have been proposed as candidates to be included in a malaria vaccine. The present work aimed at evaluating the immunogenicity of MSP-3 and GLURP and their capacity of inducing protective immunity in the non-human primate models Saimiri sciureus and Aotus infulatus. Most formulations tested were able to induce high and lasting levels of antibodies against the immunogen. The induction of antibodies able to react with the native protein or with the parasite itself happened to a lesser extent and was shown to be a determinant factor in the acquisition of protection against a P. falciparum challenge. Sera of protected animals showed higher titres against the parasite as compared to the non-protected ones and were also able to react with a polypeptide of 66-68kDa (in case of MSP-3) or 220kDa (in case of RO). In what concerns MSP-3, the MSP-3 C-terminus-SBAS2 formulation presented the highest efficacy. The RO fine specificities recognised during natural infection in man or by immunised saimiri and aotus monkeys were not the same. Immune sera and saimiri purified anti-MSP-3 antibodies showed strong inhibitory activity against P. falciparum in vitro, with or without monocytes. Among the immunised animals no correlation was observed between protection and inhibitory effect in vitro. The species A. infulatus has been shown to be an useful model for malaria vaccine studies, and has been used for the first time in the present work. In conclusion, we have shown that MSP-3 and GLURP can be immunogenic for S. sciureus and A. infulatus and able to induce protective immunity. Improvements in the formulations and/or immunisation protocols may lead to the achievement of optimal qualitative and quantitative responses.