

SUMMARY

The 40–50 kDa merozoite surface antigen (MSA2) is a candidate molecule for use in a malaria vaccine. The gene for MSA2 from the 3D7 isolate of *Plasmodium falciparum* was amplified by polymerase chain reaction and cloned into the bacterial expression vector pGEX-3X to obtain a fusion protein of MSA2 with *Schistosoma japonicum* glutathione S-transferase. The recombinant fusion protein was used to immunize rabbits. After four injections, the sera had Western blotting and immunofluorescence titres of 10^{-6} . Immune sera, and immunoglobulin (Ig)G, F(ab)'₂, F(ab) prepared from the immune sera, were assessed for their effects on the growth of 3D7 parasites in vitro by microscopy and a [³H]-hypoxanthine incorporation assay. The antibodies did not significantly inhibit red blood cell invasion and parasite growth when added to cultures as 10% v/v serum or as immunoglobulin preparations at concentrations up to 200 µg ml⁻¹. However, in the presence of IgG or F(ab)'₂, but not F(ab), antibodies to MSA2, the proportions of red blood cells invaded by more than one merozoite increased significantly. Multiple invasion is attributed to merozoites cross-linked by bivalent antibodies, attaching to and subsequently invading the same red cell. These observations have a bearing on the evasion of host immune responses by the parasite and the use of full-length recombinant MSA2 protein in a malaria vaccine.

Keywords antibodies, complement, erythrocyte invasion, immune evasion, malaria, merozoite, merozoite surface antigen, *Plasmodium falciparum*, vaccine

Antibodies to a merozoite surface protein promote multiple invasion of red blood cells by malaria parasites

R.RAMASAMY¹, S.YASAWARDENA¹, R.KANAGARATNAM¹, E.BURATTI², F.E.BARALLE² & M.S.RAMASAMY¹

¹Molecular Biology and Immunology Laboratories, Division of Life Sciences, Institute Fundamental Studies, Kandy, Sri Lanka and

²the International Centre for Genetic Engineering and Biotechnology, Padriciano 99, Trieste I-34012, Italy
