A-02: Cellular and humoral immune responses in *Plasmodium cynomolgi* MSP-1 p19 protected toque monkeys

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Plasmodium cynomolgi in its natural host, the toque monkey, *Macaca sinica*, is analogous to the *Plasmodium vivax*-human system. This host-parasite system was employed to test the immunogenicity and protective efficacy of a new preparation of baculovirus His-tagged *P cynomolgi* major merozoite surface protein-1 (MSP-1) p19 recombinant antigen with Freunds complete/incomplete adjuvant (FCA/FIA). Two groups of monkeys were used in this trial. Group 1 comprising 4 monkeys, were immunized with p19+FCA/FIA in 3 doses at zero, 1 and 2 month intervals. Group 2 comprised 2 unvaccinated monkeys. Three weeks after each immunization, serum samples were assayed for antibody levels. The antibody titres of immunized animals increased with each immunization, reaching high titres of 10^6 and 10^5, as detected by ELISA and IFA respectively, compared to 10^2 of the control group. Three weeks after the third immunization, peripheral blood mononuclear cells were isolated, to assay for *in vitro* proliferative responses against the p19 antigen, and the mitogen Con-A. Animals of both groups showed similar *in vitro* cellular proliferative responses to Con-A. However, significantly higher p19 specific cellular responses were observed in the p19+FCA/FIA vaccinated animals.

One month after the third immunization, all animals were challenged with asexual blood stage *P cynomolgi ceylonensis* parasites, and screened upto 28 days for patent infections, by examination of thick and thin blood films. All 4 monkeys in Group 1 were completely protected, and developed no patent parasitaemias. Furthermore, no sub-patent parasitaemias were detected by PCR analysis with blood samples taken 12 days after the challenge. Both control animals developed patent infections lasting upto 28 days. These results indicate that cellular and antibody responses elicited with this His-tagged *P.cynomolgi* p19 antigen administered in the presence of FCA/FIA were protective against blood stage infections.