Characterization of the effector mechanisms of a transmission-blocking antibody upon differentiation of *Plasmodium berghei* gametocytes into ookinetes *in vitro*

G. R. R. Ranawaka, A. R. Alejo-Blanco and R. E. Sinden

Molecular and Cellular Parasitology Research Group, Department of Biology, Imperial College, London SW7 2BB

SUMMARY

The transmission-blocking monoclonal antibody 13.1, which recognizes the ookinete surface antigen Pbs21 of *Plasmodium berghei*, and an IgG2a isotype control antibody 26.37 were purified by caprylic acid and ammonium sulphate precipitation. Fab fragments were prepared by papain digestion. IgG but not Fab from antibody 13.1 reduced ookinete formation by *P. berghei* in culture by as much as 94% at a concentration of 100 μg/ml. There was little difference in antibody efficacy in the range 6.25–400 μg/ml in this assay. The parasite was most sensitive to antibody activity in the first 6–9 h of culture, i.e. the gamete/zygote and early retort stages. Peripheral blood leucocytes (PBL) were essential to achieve maximal inhibition by mAb 13.1 (activity was abrogated totally if PBL were removed). Together the data suggest that one of the mechanisms of action of this antibody is antibody-mediated PBL killing. Phagocytosis of parasites was noted in these experiments in all cultures. We have not attempted in this study to distinguish between Fc-mediated opsonization, as opposed to antibody-dependent cellular cytotoxicity.

Key words: ookinete, transmission-blocking antibody, phagocytosis, leucocytes

*Parasitology* (1994), 109, 11-17  Cambridge University Press