Characterization of the modes of action of anti-Pbs21 malaria transmission-blocking immunity: ookinete to oocyst differentiation *in vivo*

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Abstract

The impact of immune sera, and peripheral blood cells (PBC) from mice immunized with *Plasmodium berghei* ookinetes; and of purified immunoglobulin or Fab fragments from anti-Pbs21 monoclonal antibody 13.1, upon establishment of oocyst infections in the mosquito was studied. Infections were initiated either from gametocyte-infected mice, or membrane feeders which contained either gametocytes or mature ookinetes. PBC from ookinete-immunized mice presented with non-immune serum failed to show any transmission-blocking activity. Anti-ookinete serum, intact anti-Pbs21 monoclonal antibody 13.1 or its Fab fragments, all inhibited oocyst formation significantly. When gametocyte-infected mice or gametocytes in membrane feeds were used, inhibition did not directly correlate with antibody concentration. In membrane feeders that contained ookinetes and antibody, concentration-dependent inhibition usually occurred. The efficacy of purified 13.1 IgG was dependent upon the ookinete concentration. The ookinete plasmalemma and cytoplasm were significantly disturbed after 12h in bloodmeals that contained antibody 13.1, but not in the isotype controls. These changes may have caused the observed failure of the ookinete to migrate as rapidly as the controls from the destructive environment of the bloodmeal.

Key words: *Plasmodium berghei*, transmission-blocking, antibody, Fab, leucocytes, ookinete

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