

MONOCLONAL ANTIBODIES TO GAMETES OF
 PLASMODIUM VIVAX : IDENTIFICATION OF ANTIGENIC
 DETERMINANTS MEDIATING TRANSMISSION BLOCKING IMMUNITY

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Polyclonal rabbit antibodies to *Plasmodium vivax* gametes block the infectivity of the parasite to mosquitoes. Such transmission-blocking antibodies are also formed in the course of natural human infections of *P.vivax*.² In order to identify the target antigens responsible for transmission-blocking immunity, monoclonal antibodies (MAbs) to *P.vivax* gametes, have been produced using the technique described by Kohler and Milstein.³

Thirty hybridoma lines producing antibody reactive with *P.vivax* gametes were cloned successfully. Of these, 18 were reactive to surface antigens of gametes as detected by immunofluorescent staining of unfixed parasites. The latter antibodies were screened for their ability to block the infectivity of gametes to colonised *Anopheles tessellatus* mosquitoes in an *in vitro* membrane feeding system.

Four MAbs able to block transmission by more than 75% were detected. The target antigens of these MAbs were identified by the Western Blot technique.

Characteristics of the MAbs that block transmission by more than 75%

MAb Line	No of feeding expts. done	No of expts. showing > 75% Tx effect*	Isotype**	Mr
FN2.M1.1202.6H	14	8	IgG1	37,42
FN2.M2.11A1.7H	7	3	IgG1	37,42
3/1C/1(1/5D).12H	9	4	IgM	27
1/2F(10/1F).11D	12	8	IgM	17,24

* %block of transmission

$$= \frac{100 - \text{No of oocysts/gut of mosquitoes, infected with gametes + antibody (X 100)}}{\text{No of oocysts/gut of mosquitoes, infected with gametes + controls}}$$

** MAb isotype was determined by immunodiffusion tests using immunoglobulin subclass specific antisera

It is notable that two of the "transmission-blocking MAbs" react with the same doublet of antigens (Mr 42,000 and 37,000), while the other two recognise different molecules on the gamete surface.

Experiments on different *P.vivax* isolates show that a given antibody does not block transmission of all strains of the parasite. This indicates the existence of antigenic variability, a conclusion which is supported by preliminary data using immunofluorescence techniques as well.

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References

1. Munesinghe, Y.D., Mendis, K.N. and Carter, R (1986) *Parasite Immunol* 8 (3),23
2. Mendis, K.N., Munesinghe, Y.D., de Silva, Y.N.Y., Keragalle, I. and Carter, R (1984), *Proc.Sri Lanka Ass.Advnt.Sci.* 40 (1),10
3. Kohler, G.and Milstein, C (1975) *Nature* 256 495