

AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

Batch 39

1. SUBJECT CLASSIFICATION	A. PRIMARY	TEMPORARY
	B. SECONDARY	

2. TITLE AND SUBTITLE
Serologic diagnosis of malaria; progress report, Jan.1968-June,1972

3. AUTHOR(S)
(100) Kagan, I.G.
(101) HEW/PHS

4. DOCUMENT DATE 1972	5. NUMBER OF PAGES 2p.	6. ARC NUMBER ARC
--------------------------	---------------------------	----------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS
PHS

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)
(Research summary)

9. ABSTRACT

(HEALTH R & D)

10. CONTROL NUMBER PN-AAC-645	11. PRICE OF DOCUMENT
12. DESCRIPTORS	13. PROJECT NUMBER
	14. CONTRACT NUMBER PASA RA(HA)-5-68 Res.
	15. TYPE OF DOCUMENT

PASA RA (HM)-5-68 Rpt.
PN-AAC-645

REPORT SUMMARY

A. 1. Project Title and Contract Number: Serologic Diagnosis of Malaria; AID PASA Control No. RA (HM) 5-68, Amendments #7 and #8; PIO/T No. 931-17-511-485-72-3127702.

2. Principal Investigator, Contractor, and Mailing Address:

Dr. Irving G. Kagan
Chief, Parasitology Branch, Laboratory Division
Center for Disease Control
Health Services and Mental Health Administration
Public Health Service
U. S. Department of Health, Education, and Welfare
Atlanta, Georgia 30333

3. Contract Period: January 1, 1968, to June 30, 1972.

4. Period Covered by Report: January 1, 1968, to June 30, 1972.

5. Total AID Funding of Contract to Date: \$403,473.

B. Narrative Summary of Accomplishments and Utilization

1. Indirect Hemagglutination (IHA) Test

Genus specific antigens can be prepared from Plasmodium knowlesi parasites maintained in rhesus monkeys which react with antibodies to human Plasmodium species. Use of homologous cells improves the sensitivity and normal rabbit serum enhances the specificity. Antibodies to malaria can be measured from filter paper blood specimens. The antibody titer is not affected by prolonged storage at -20° C. Antibodies are detectable 8 to 27 days after onset of parasitemia, and they can persist for many years after infection.

When fresh human O cells are used, the sensitivity is 86 to 94 percent, and the specificity is more than 95 percent. Titer differences within one twofold dilution can occur 76 percent of the time due to variability of the test. Initial results of use of double aldehyde fixed and sensitized cells indicate that this method can reduce the variability of the test results.

The IHA test may have a wide range of applications in malaria programs: to measure the level of malaria endemicity, to verify

the absence or presence of transmission by testing specimens from a relatively small number of persons, to delineate malarious areas, to detect seasonal changes of malaria transmission, to investigate suspected reintroductions of malaria into consolidation or maintenance phase areas, to detect foci of malaria transmission, to measure the effect of antimalarial activities on the transmission of malaria, and to assess the efficacy of the malaria surveillance system. The test can be especially useful in areas where the regular malaria surveillance network is limited, and it can be used as a screening mechanism to detect potential carriers of malaria parasites.

Preliminary findings indicate that the IHA test will be a valuable adjunct to the present surveillance methods. With serologic methods, valuable information can be obtained by testing specimens from relatively small population samples, and, if necessary, these samples can be obtained independently from the routine surveillance system of the malaria program or the general health services.

2. Indirect Fluorescent Antibody (IFA) Test

A method was developed to prepare a thick smear antigen, and it was found that use of schizonts increases the reactivity. The Aotus monkey is the source of antigen for P. vivax and P. falciparum. There is no in vivo reaction of malarial antibody with intra-erythrocytic plasmodia. IgM malaria specific antibodies have been demonstrated, and a multi-species antigen has been developed which increases the number of sera that can be tested. The occurrence of cross-reactivity between Babesia and Plasmodium infections was demonstrated in human and animal sera. The ability to identify species-specific malaria antibodies and to detect specific malaria antibody of the IgG and IgM classes are special advantages of this method. At present the IFA test is time consuming and difficult to perform, but efforts are being made to automate the test procedure.

3. Complement Fixation (CF) Test

Preliminary tests indicate that the sensitivity and specificity of this test are comparable to those of the IFA test. However, antigens to be used in identifying Plasmodium species by the CF test have not yet been fully evaluated.