

P57

<u>Chloroquine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	26.5	100.00
0.02	20.0	75.47
0.04	20.0	75.47
0.08	15.5	58.49
0.16	4.0	15.09
0.32	0.0	0.00
0.64	0.0	0.00
1.28	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

In vitro response to quinine of field isolates of *Plasmodium falciparum* collected in KwaZulu in April 1989, in the 24-hour microtechnique

P7

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	84.5	97.69
0.08	86.5	100.00
0.16	62.0	71.68
0.32	20.5	23.70
0.64	1.0	1.16
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P9

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	169.5	100.00
0.08	162.0	95.58
0.16	162.0	95.58
0.32	161.5	95.28
0.64	109.5	64.60
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P10

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	64.0	100.00
0.08	58.5	91.41
0.16	39.0	60.94
0.32	23.5	36.72
0.64	0.0	0.00
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC₅₀ value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P12

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	32.0	90.14
0.08	23.5	66.20
0.16	35.5	100.00
0.32	4.0	11.27
0.64	0.0	0.00
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P13

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	92.5	78.06
0.08	102.5	86.50
0.16	118.5	100.00
0.32	49.0	41.35
0.64	26.5	22.36
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P14

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	26.0	100.00
0.08	9.0	34.62
0.16	24.5	94.23
0.32	19.0	73.08
0.64	9.0	34.62
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P15

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	13.5	71.05
0.08	15.0	78.95
0.16	19.0	100.00
0.32	14.0	73.68
0.64	11.5	60.53
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P16

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	87.5	100.00
0.08	82.5	94.29
0.16	80.0	91.43
0.32	60.5	69.14
0.64	23.5	26.86
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P18

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	116.5	86.94
0.08	110.0	82.09
0.16	134.0	100.00
0.32	126.5	94.40
0.64	19.5	14.55
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P22

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	24.0	94.12
0.08	25.5	100.00
0.16	25.0	98.04
0.32	20.5	80.39
0.64	11.5	45.10
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P32

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	55.0	100.00
0.08	41.5	75.45
0.16	45.0	81.82
0.32	37.5	68.18
0.64	40.5	73.64
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

P33

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	46.5	100.00
0.08	34.0	73.12
0.16	19.0	40.86
0.32	27.5	59.14
0.64	4.0	8.60
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P45

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	32.5	74.71
0.08	30.5	70.11
0.16	29.0	66.67
0.32	43.5	100.00
0.64	34.0	78.16
1.28	15.5	35.63
2.56	0.0	0.00
5.12	0.0	0.00

P46

<u>Quinine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	18.0	87.80
0.08	20.5	100.00
0.16	20.5	100.00
0.32	13.0	63.41
0.64	1.5	7.32
1.28	0.0	0.00
2.56	0.0	0.00
5.12	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

In vitro response to sulphadoxine/pyrimethamine of field isolates of *Plasmodium falciparum* collected in KwaZulu in April 1989, in the 24-hour microtechnique

E7

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	32.0	100.00
0.2	14.0	43.75
0.6	0.0	0.00
2.0	0.0	0.00
6.0	0.0	0.00
20.0	0.0	0.00
60.0	0.0	0.00
200.0	0.0	0.00

P9

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	79.0	91.33
0.2	65.0	75.14
0.6	70.0	80.92
2.0	82.0	94.80
6.0	86.5	100.00
20.0	57.0	65.90
60.0	25.5	29.48
200.0	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC₅₀ value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P10

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	17.0	100.00
0.2	16.5	97.06
0.6	14.5	85.29
2.0	12.5	73.53
6.0	4.5	26.47
20.0	0.5	2.94
60.0	0.0	0.00
200.0	0.0	0.00

P12

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	20.5	100.00
0.2	16.0	78.05
0.6	19.5	95.12
2.0	18.5	90.24
6.0	16.0	78.05
20.0	0.5	2.44
60.0	0.0	0.00
200.0	0.0	0.00

P13

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	38.0	63.33
0.2	60.0	100.00
0.6	38.5	64.17
2.0	35.0	58.33
6.0	35.5	59.17
20.0	27.0	45.00
60.0	0.0	0.00
200.0	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P15

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	14.0	77.78
0.2	18.0	100.00
0.6	10.0	55.56
2.0	7.0	38.89
6.0	4.5	25.00
20.0	3.0	16.67
60.0	0.5	2.78
200.0	0.0	0.00

P16

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	39.0	66.67
0.2	48.5	82.91
0.6	37.5	64.10
2.0	58.5	100.00
6.0	37.0	63.25
20.0	49.0	83.76
60.0	29.0	49.57
200.0	0.0	0.00

P18

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	60.0	96.77
0.2	62.0	100.00
0.6	54.5	87.90
2.0	53.0	85.48
6.0	40.0	64.52
20.0	5.0	8.06
60.0	0.0	0.00
200.0	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

P32

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	17.5	100.00
0.2	13.0	74.29
0.6	10.5	60.00
2.0	9.5	54.29
6.0	7.0	40.00
20.0	6.5	37.14
60.0	0.0	0.00
200.0	0.0	0.00

P33

<u>Sulphadoxine/ pyrimethamine concentration (μM)</u>	<u>Schizonts per 200 parasites^a</u>	<u>Percentage control growth^b</u>
Control	15.5	100.00
0.2	6.5	41.94
0.6	9.0	58.06
2.0	8.5	54.84
6.0	6.5	41.94
20.0	9.0	58.06
60.0	6.5	41.94
200.0	0.0	0.00

^a Mean of 2 counts

^b For the calculation of the IC_{50} value, where the mean schizont count in the control wells was less than that in some of the test wells, the highest count was taken as 100% control growth

In vitro response to chloroquine of field isolates of *Plasmodium falciparum* collected in KwaZulu in March 1990, in the radioisotope uptake assay

N35

<u>Chloroquine concentration (μM)</u>	<u>Mean cou. s per minute</u>	<u>Percentage control growth</u>
Control	10042	100.00
0.01	9372	93.33
0.02	3314	33.00
0.04	0	0.00
0.08	0	0.00
0.16	0	0.00
0.32	0	0.00
0.54	0	0.00

N42

<u>Chloroquine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	2035	100.00
0.01	970	47.67
0.02	951	46.73
0.04	12	0.59
0.08	0	0.00
0.16	0	0.00
0.32	0	0.00
0.64	0	0.00

N69

<u>Chloroquine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	2688	100.00
0.01	2274	84.6
0.02	713	26.53
0.04	16	0.60
0.08	0	0.00
0.16	0	0.00
0.32	0	0.00
0.64	0	0.00

N81

<u>Chloroquine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	2636	100.00
0.01	2292	86.95
0.02	1544	58.57
0.04	230	8.73
0.08	68	2.58
0.16	28	1.06
0.32	12	0.46
0.64	7	0.27

In vitro response to quinine of field isolates of *Plasmodium falciparum* collected in KwaZulu in March 1990, in the radioisotope uptake assay

N35

<u>Quinine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	8057	100.00
0.04	2418	30.01
0.08	1302	16.16
0.16	237	2.94
0.32	0	0.00
0.64	0	0.00
1.28	0	0.00
2.56	0	0.00

N42

<u>Quinine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	3293	100.00
0.04	2189	66.47
0.08	1421	43.15
0.16	477	14.49
0.32	35	1.06
0.64	0	0.00
1.28	0	0.00
2.56	0	0.00

N69

<u>Quinine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	2481	100.00
0.04	1772	71.12
0.08	974	39.26
0.16	504	20.31
0.32	135	5.44
0.64	10	0.40
1.28	0	0.00
2.56	0	0.00

N81

<u>Quinine concentration (μM)</u>	<u>Mean counts per minute</u>	<u>Percentage control growth</u>
Control	2429	100.00
0.04	1902	78.30
0.08	1261	51.91
0.16	726	29.89
0.32	142	5.85
0.64	74	3.05
1.28	47	1.93
2.56	3	0.12

REFERENCES

1. Global Malaria Control Strategy. Ministerial Conference on Malaria. Amsterdam, Netherlands, 26 - 27 October 1992. WHO unpublished document CTD/MAL/EXP/92.3.
2. Sharp BL, 1991. Aspects of the epidemiology of malaria in Natal province, Republic of South Africa. PhD thesis, University of Natal, Durban, South Africa.
3. Walliker D, 1983. The genetic basis of diversity in malaria parasites. *Adv Parasitol*, 22: 217-259.
4. Trager W, Jensen JB, 1976. Human malaria parasites in continuous culture. *Science*, 193: 673-675.
5. Beale GH, Walliker D, 1988. Biological characterization of malaria parasites. In: *Malaria. Principles and Practice of Malariology*, Vol 1, Wernsdorfer WH, McGregor I (editors). Edinburgh: Churchill Livingstone, pp 395-409.
6. Jensen JB, Trager W, 1977. *Plasmodium falciparum* in culture: use of outdated erythrocytes and description of the candle jar method. *J Parasitol*, 63: 883-886.
7. Jensen JB, Trager W, 1978. *Plasmodium falciparum* in culture: establishment of additional strains. *Am J Trop Med Hyg*, 27: 743-746.
8. Chin W, Collins WE, 1980. Comparative studies of

- three strains of *Plasmodium falciparum* isolated by the culture method of Trager and Jensen. *Am J Trop Med Hyg*, 29: 1143-1146.
9. Scheibel LW, Ashton SH, Trager W, 1979.
Plasmodium falciparum: microaerophilic requirements in human red blood cells. *Exp Parasitol*, 47: 410-418.
 10. Osisanya JOS, Gould S, Warhurst DC, 1981. A simple culture technique for *Plasmodium falciparum*. *Ann Trop Med Parasitol*, 75: 107-109.
 11. Zolg JW, MacLeod AJ, Dickson IH, Scaife JG, 1982. *Plasmodium falciparum*: modifications of the in vitro culture conditions improving parasitic yields. *J Parasitol*, 68: 1072-1080.
 12. Butcher GA, 1979. Factors affecting the in vitro culture of *Plasmodium falciparum* and *Plasmodium knowlesi*. *Bull WHO*, 57 (Suppl 1): 17-26.
 13. Butcher GA, 1981. A comparison of static thin layer and suspension cultures for the maintenance in vitro of *Plasmodium falciparum*. *Ann Trop Med Parasitol*, 75: 7-17.
 14. Fairlamb AE, Warhurst DC, Peters W, 1985. An improved technique for the cultivation of *Plasmodium falciparum* in vitro without daily medium change. *Ann Trop Med Parasitol*, 79: 379-384.
 15. Ponnudurai T, Meuwissen JHETH, Leeuwenberg ADEM, Verhave JP, Lensen AHW, 1982. The production of

- mature gametocytes of *Plasmodium falciparum* in continuous cultures of different isolates infective to mosquitoes. *Trans R Soc Trop Med Hyg*, 76: 242-250.
16. Campbell JR, 1984. Letter to the Editor. *J Parasitol*, 70: 966.
 17. Sanderson A, Walliker D, Molez J-F, 1981. Enzyme typing of *Plasmodium falciparum* from Africa and some other Old World countries. *Trans R Soc Trop Med Hyg*, 75: 263-267.
 18. Thaithong S, Sueblinwong T, Beale GH, 1981. Enzyme typing of some isolates of *Plasmodium falciparum* from Thailand. *Trans R Soc Trop Med Hyg*, 75: 268-270.
 19. Carter R, 1978. Studies on enzyme variation in the murine malaria parasites *Plasmodium berghei*, *P. yoelii*, *P. vinckei*, and *P. chabaudi* by starch gel electrophoresis. *Parasitol*, 76: 241-267.
 20. Harris H, Hopkinson DA, 1976. *Handbook of Enzyme Electrophoresis in Human Genetics*. Amsterdam: North-Holland Publishing Company.
 21. Report of a WHO Scientific Group, 1987. The epidemiology of drug resistance of malaria parasites: Memorandum from a WHO meeting. *Bull WHO*, 65: 797-816.
 22. McBride JS, Walliker D, Morgan G, 1982. Antigenic diversity in the human malaria parasite *Plasmodium falciparum*. *Science*, 217: 254-257.
 23. McBride JS, Welsby PD, Walliker D, 1984.

- Serotyping *Plasmodium falciparum* from acute human infections using monoclonal antibodies. *Trans R Soc Trop Med Hyg*, 78: 32-34.
24. Knowles G, Davidson WL, McBride JS, Jolley D, 1984. Antigenic diversity found in isolates of *Plasmodium falciparum* from Papua New Guinea by using monoclonal antibodies. *Am J Trop Med Hyg*, 33: 204-211.
25. Schofield L, Saul A, Myler P, Kidson C, 1982. Antigenic differences among isolates of *Plasmodium falciparum* demonstrated by monoclonal antibodies. *Infect Immun*, 38: 893-897.
26. Pass A, Avidor B, Golenser J, Laskov R, Sulitzeanu D, 1985. Use of a monoclonal, anti *Plasmodium berghei* antibody, cross reacting with *P. falciparum*, for the detection of *P. falciparum* in *in vitro* infected blood. *Immunol Letters*, 10: 31-34.
27. McBride JS, Newbold CI, Anand R, 1985. Polymorphism of a high molecular weight schizont antigen of the human malaria parasite *Plasmodium falciparum*. *J Exp Med*, 161: 160-180.
28. Fenton B, Clark JT, Wilson CF, McBride JS, Walliker D, 1989. Polymorphism of a 35-48 kDa *Plasmodium falciparum* merozoite surface antigen. *Mol Biochem Parasitol*, 34: 79-86.
29. Simmons D, Worllett G, Bergin-Cartwright M, Kay D, Scaife J, 1987. A malaria protein exported into a

- new compartment within the host erythrocyte. *EMBO J*, 6: 485-491.
30. Tanabe K, Mackay M, Goman M, Scaife GJ, 1987. Allelic dimorphism in a surface antigen gene of the malaria parasite *Plasmodium falciparum*. *J Mol Biol*, 195: 273-287.
31. Wilson CF, Anand R, Clark JT, McBride JS, 1987. Topography of epitopes on a polymorphic schizont antigen of *Plasmodium falciparum* determined by the binding of monoclonal antibodies in a two-site radioimmunoassay. *Parasite Immunol*, 9: 737-746.
32. Avidor B, Golenser J, Sulitzeanu D, 1985. Detection of *Plasmodium falciparum* using a radioimmunoassay based on a crossreacting, monoclonal anti-*P. berghei* antibody - *P. berghei* system. *J Immunol Methods*, 82: 121-129.
33. di Santi SM, Boulos M, Vasconcelos MA, Oliveira S, Couto A, Rosario VE, 1987. Caracterizacao de cepas de *Plasmodium falciparum* do Estado de Rondonia, Brasil, utilizando microtestes de sensibilidade aos antimalaricos tipificacao enzimatica a anticorpos monoclonais. *Rev Inst Med Trop Sao Paulo*, 29: 142-147.
34. Fogh S, Jepsen S, Efferso P, 1979. Chloroquine-resistant *Plasmodium falciparum* malaria in Kenya. *Trans R Soc Trop Med Hyg*, 73: 228-229.
35. Kean BH, 1979. Chloroquine-resistant falciparum malaria from Africa. *JAMA*, 241: 395-396.
36. Spracklen FHN, Whittaker RG, 1984. Malaria 1984.

- Part II. Drug-resistant malaria. *S Afr Med J*, 66: 211-216.
37. Dallas ABC, Mutambu SL, Taylor P, 1984. Chloroquine-resistant *Plasmodium falciparum* malaria in Zimbabwe. *Cent Afr J Med*, 30: 204-205.
38. Raviglione MC, 1987. Appearance of chloroquine-resistant *falciparum* malaria in Swaziland. *Lancet*, ii: 44-45.
39. Bac DJ, Cox GA, Isaacson M, 1985. *In vivo* and *in vitro* chloroquine-resistant *falciparum* malaria in Venda. *S Afr Med J*, 67: 937-938.
40. Herbst JM, Taylor LA, Joubert SM, 1985. *In vitro* chloroquine-resistant *Plasmodium falciparum* malaria in the Natal/KwaZulu area. *S Afr Med J*, 68: 749-750.
41. Visagie NJ, Sieling WL, 1985. Chloroquine-resistant *Plasmodium falciparum* malaria in South Africa. *S Afr Med J*, 68: 600-601.
42. Onori E, 1984. The problem of *Plasmodium falciparum* drug resistance in Africa south of the Sahara. *Bull WHO*, 62 (Suppl.): 55-62.
43. Hansford CF, 1989. Chloroquine resistance in *Plasmodium falciparum* in KwaZulu, 1983 - 1988. *S Afr Med J*, 76: 546-547.
44. Nguyen-Dinh P, Payne D, 1980. Pyrimethamine sensitivity in *Plasmodium falciparum*: determination *in vitro* by a modified 48-hour test. *Bull WHO*, 58: 909-912.

45. Spencer HC, Sixsmith DG, Watkins WM, Koech DK, Chulay JD, 1985. *In vitro* response of Kenyan *Plasmodium falciparum* to chloroquine in different media. *Trans R Soc Trop Med Hyg*, 79: 116-118.
46. Howells RE, 1987. The antimalarial action of chloroquine and mechanisms of resistance. *Ann Trop Med Parasitol*, 81: 629-637.
47. Report of a WHO Scientific Group, 1984. Advances in malaria chemotherapy. *WHO Tech Rep Ser No.* 711.
48. Schapira A, 1984. Concomitant resistance to pyrimethamine and cycloguanil of chloroquine-resistant *falciparum* malaria from East Africa: an *in vitro* study of 12 isolates. *Trans R Soc Trop Med Hyg*, 78: 359-362.
49. Thaithong S, Beale GH, Chutmongkonkul M, 1983. Susceptibility of *Plasmodium falciparum* to five drugs: an *in vitro* study of isolates mainly from Thailand. *Trans R Soc Trop Med Hyg*, 77: 228-231.
50. Sharp BL, Ngxongo S, Botha MJ, Ridl F, le Sueur D, 1988. An analysis of 10 years of retrospective malaria data from the KwaZulu areas of Natal. *S Afr J Sci*, 84: 102-106.
51. Smalley ME, Brown J, 1982. *In vitro* demonstration of pyrimethamine resistance of "wild" *Plasmodium falciparum* in The Gambia. *Trans R Soc Trop Med Hyg*, 76: 324-328.
52. Spencer HC, Watkins WW, Sixsmith DG, Koech DK, 1986. Response of *Plasmodium falciparum* to

- dihydrofolate reductase inhibitors in Malindi, Kenya. *Trans R Soc Trop Med Hyg*, 80: 201-203.
53. Nguyen-Dinh P, Trager W, 1978. Chloroquine resistance produced *in vitro* in an African strain of human malaria. *Science*, 200: 1397-1398.
54. Jensen JB, Capps TC, Carlin JM, 1981. Clinical drug-resistant falciparum malaria acquired from cultured parasites. *Am J Trop Med Hyg*, 30: 523-525.
55. Thaithong S, Beale GH, Chutmongkonkul M, 1988. Variability in drug susceptibility amongst clones and isolates of *Plasmodium falciparum*. *Trans R Soc Trop Med Hyg*, 82: 33-36.
56. Teklehaimanot A, Nguyen-Dinh P, Collins WE, Barber AM, Campbell CC, 1985. Evaluation of sporontocidal compounds using *Plasmodium falciparum* gametocytes produced *in vitro*. *Am J Trop Med Hyg*, 34: 429-434.
57. Lamont G, Darlow B, 1982. Comparison of *in vitro* pyrimethamine assays and *in vivo* response to sulphadoxine-pyrimethamine in *Plasmodium falciparum* from Papua New Guinea. *Trans R Soc Trop Med Hyg*, 76: 797-799.
58. Wernsdorfer WH, 1991. The development and spread of drug-resistant malaria. *Parasitol Today*, 7: 297-303.
59. Boudreau EF, Pang LW, Dixon KE, Webster HK, Pavanand K, Tosingha L, Somutsakorn P, Canfield

- CJ, 1988. Malaria: treatment efficacy of halofantrine (WR 171,669) in initial field trials in Thailand. *Bull WHO*, 66: 227-235.
60. Watkins WM, Oloo JA, Lury JD, Mosoba M, Kariuki D, Mjomba M, Koech DK, Gilles HM, 1988. Efficacy of multiple-dose halofantrine in treatment of chloroquine-resistant falciparum malaria in children in Kenya. *Lancet*, 2: 247-249.
61. Chitchang S, Wongteptien S, 1989. A clinical trial of halofantrine in acute uncomplicated malaria in Thai soldiers. In: *Halofantrine in the Treatment of Multidrug-resistant Malaria*, Warhurst DC, Schofield CJ (editors). Cambridge: Elsevier, pp 21-26.
62. Parkinson D, Balmer V, Ajdukiewicz A, Korinohowa A, Kere N, 1989. The effectiveness of halofantrine for the treatment of acute malaria in adults in the Solomon Islands. In *Halofantrine in the Treatment of Multidrug-resistant Malaria* (Warhurst DC, Schofield CJ, eds), pp 27-36, Elsevier, Cambridge.
63. Wirima J, Khoromana C, Molyneux ME, Gilles HM, 1988. Clinical trials with halofantrine hydrochloride in Malawi. *Lancet*, 2: 250-251.
64. Rojas-Rivero L, Gay F, Bustos MDG, Ciceron L, Pichet C, Danis M, Gentilini M, 1992. Mefloquine-halofantrine cross-resistance in *Plasmodium falciparum* induced by intermittent mefloquine pressure. *Am J Trop Med Hyg*, 47: 372-377.

65. Webster HK, Boudreau EF, Pavanand K, Yongvanitchit K, Pang LW, 1985. Antimalarial drug susceptibility testing of *Plasmodium falciparum* in Thailand using a microdilution radioisotope method. *Am J Trop Med Hyg*, 34: 228-235.
66. Childs GE, Wimonwattrawatee T, Pooyindee N, 1988. Evaluation of an *in vitro* assay system for drug susceptibility of field isolates of *Plasmodium falciparum* from southern Thailand. *Am J Trop Med Hyg*, 38: 19-23.
67. Deloron P, Le Bras J, Ramanamirija JA, Coulanges P, 1985. *Plasmodium falciparum* in Madagascar: *in vivo* and *in vitro* sensitivity to seven drugs. *Ann Trop Med Parasitol*. 79: 357-365.
68. Ringwald P, Le Bras J, Voyer C, Coulaud J-P, 1990. Reduced *in vitro* susceptibility to halofantrine of *Plasmodium falciparum* in West Africa. *Lancet*, 1: 421-422.
69. Desjardins RE, Canfield CJ, Haynes JD, Chulay JD, 1979. Quantitative assessment of antimalarial activity *in vitro* by a semiautomated microdilution technique. *Antimicrob Agents Chemother*, 16: 710-718.
70. SAS/STAT, RELEASE 6.03 (1988). Cary, North Carolina: SAS Institute Inc.
71. Oduola AM, Milhous WK, Salako LA, Walker O, 1987. Reduced *in vitro* susceptibility to mefloquine in West African isolates of *Plasmodium falciparum*.

- Lancet*, 2: 1304-1305.
72. Basco LK, Le Bras J, Gillotin C, Ringwald P, Rabearison E, Gimenez F, Bouchaud O, Farinotti R, Coulaud J-P, 1991. Type RI resistance to halofantrine in West Africa. *Trop Med Parasitol*, 42: 413-414.
73. Björkman A, Phillips-Howard PA, 1990. The epidemiology of drug-resistant malaria. *Trans R Soc Trop Med Hyg*: 84, 177-180.
74. Wernsdorfer WH, Payne D, 1988. Drug sensitivity tests in malaria parasites. In: *Malaria. Principles and Practice of Malariology, Vol 2*, Wernsdorfer WH, McGregor I (editors). Edinburgh: Churchill Livingstone, pp 1765-1800.
75. Lemnge MM, Inambao AW, 1990. The *in vitro* response of *Plasmodium falciparum* to mefloquine at Lubwe and Kalene in Zambia. *Trans R Soc Trop Med Hyg*, 84: 668-669.
76. Warhurst DC, Hall AP, Tjokrosonto S, 1985. RI quinine-Fansidar resistant *falciparum* malaria from Malawi. *Lancet*, ii: 330.
77. Bisseru B, 1988. Quinine-resistant *Plasmodium falciparum* in Zambia. *Cent Afr J Med*, 34: 17-18.
78. Schapira A, Bygbjerg IBC, Jepsen S, Flachs H, Bentzon MW, 1986. The susceptibility of *Plasmodium falciparum* to sulphadoxine and pyrimethamine: correlation of *in vivo* and *in vitro* results. *Am J Trop Med Hyg*, 35: 239-245.
79. Schapira A, Almeida Franco LT, Averkiev L,

- Omwale, Schwalbach JFL, Suleimanov G, 1988. The *Plasmodium falciparum* chloroquine *in vivo* test: extended follow-up is more important than parasite counting. *Trans R Soc Trop Med Hyg*, 82: 39-43.
80. Lelijveld J, Kortmann H, 1970. The eosin colour test of Dill and Glazko: a simple field test to detect chloroquine in urine. *Bull WHO*, 42: 477-479.
81. Rieckmann KH, Sax LJ, Campbell GH, Mrema JE, 1978. Drug sensitivity of *Plasmodium falciparum*. An *in vitro* microtechnique. *Lancet*, i: 22-23.
82. Spencer HC, Kariuki DM, Koech DK, 1983. Chloroquine-resistance in *Plasmodium falciparum* from Kenyan infants. *Am J Trop Med Hyg*, 32: 922-925.
83. Smrkovski LL, Hoffman SL, Purnomo, Hussein RP, Masbar S, Kurniawan L, 1983. Chloroquine resistant *Plasmodium falciparum* on the island of Flores, Indonesia. *Trans R Soc Trop Med Hyg*, 77: 459-462.
84. Markus MB, 1985. Immune plasma complicates determination of sensitivity of malaria to chloroquine. *S Afr Med J*, 68: 136.
85. Kouznetsov RL, Rooney W, Wernsdorfer WH, El Gaddal AA, Payne D, Abdalla RE, 1980. Use of the *in vitro* microtechnique for the assessment of drug sensitivity of *Plasmodium falciparum* in Sennar, Sudan. *Bull WHO*, 58: 785-789.

86. Herbst JM, Taylor LA, Joubert SM, 1987. Chloroquine-resistance in *Plasmodium falciparum* in Natal. *S Afr Med J*, 72: 627-629.
87. Onori E, Payne D, Grab B, Horst HI, Almeida Franco J, Joia H, 1982. Incipient resistance of *Plasmodium falciparum* to chloroquine among a semi-immune population of the United Republic of Tanzania. 1. Results of *in vivo* and *in vitro* studies and of an ophthalmological survey. *Bull WHO*, 60: 77-87.
88. Kihamia CM, Gill HS, 1982. Chloroquine-resistant *falciparum* malaria in semi-immune native African Tanzanians. *Lancet*, ii: 43.
89. White GB, 1974. *Anopheles gambiae* complex and disease transmission in Africa. *Trans R Soc Trop Med Hyg*, 68: 278-301.
90. Le Sueur D, Sharp BL, 1988. The breeding requirements of three members of the *Anopheles gambiae* Giles complex (Diptera Culicidae) in the endemic malaria areas of Natal, South Africa. *Bull Ent Res*, 78: 549-560.
91. Schapira A, Schwalbach JFL, 1988. Evaluation of four therapeutic regimens for *falciparum* malaria in Mozambique, 1986. *Bull WHO*, 66: 219-226.
92. Lemnge MM, Inambao AW, 1988. *In vivo* and *in vitro* sensitivity of *Plasmodium falciparum* to chloroquine at Lubwe and Kalene in Zambia: use of amodiaquine as an alternative antimalarial drug. *Trans R Soc Trop Med Hyg*, 82: 194-196.

93. Thaithong S, Suebsaeng L, Rooney W, Beale GH, 1988. Evidence of increased chloroquine sensitivity in Thai isolates of *Plasmodium falciparum*. *Trans R Soc Trop Med Hyg*, 82: 37-38.
94. International Travel and Health. Vaccination Requirements and Health Advice. World Health Organization. Geneva, 1992.
95. Benzerroug EH. Malaria in the Africa region. World Health Organization interregional conference on malaria control in Africa, Brazzaville, 21-25 October, 1991.
96. Health Information for International Travel 1991. U.S. Department of Health and Human Services. Centers for Disease Control. Atlanta, Georgia.
97. ICI Pharmaceuticals (personal communication).
98. Schwalbach J, Schapira A, Suleimanov G, 1985. Chloroquine-resistant malaria in Mozambique. *Lancet*, ii: 897-898.
99. Jensen JB, 1988. *In vitro* cultivation of malaria parasites: erythrocytic stages. In *Malaria. Principles and Practice of Malariology, Vol 1*, Wernsdorfer WH, McGregor I (Editors). Edinburgh: Churchill Livingstone, pp 307-320.
100. Divo AA, Jensen JB, 1982. Studies on serum requirements for the cultivation of *Plasmodium falciparum*. 2. Medium enrichment. *Bull WHO*, 60: 571-575.
101. Divo AA, Vande Waa JA, Campbell JR, Jensen JB,

1985. Isolation and cultivation of *Plasmodium falciparum* using adult bovine serum. *J Parasitol*, 71: 504-509.
102. Ofulla AVO, Okoye VCN, Khan B, Githure JI, Roberts KR, Johnson AJ, Martin SK, 1993. Cultivation of *Plasmodium falciparum* parasites in a serum-free medium. *Am J Trop Med Hyg*, 49: 335-340.
103. McColm AA, McHardy N, 1984. Evaluation of a range of antimicrobial agents against the parasitic protozoa, *Plasmodium falciparum*, *Babesia rodhaini* and *Theileria parva* in vitro. *Ann Trop Med Parasitol*, 78: 345-354.
104. Yayon A, Friedman S, Ginsburg H, 1984. *Plasmodium falciparum*: elimination of fungal and bacterial contamination from in vitro culture. *Ann Trop Med Parasitol*, 78: 167-168.
105. Mazier D, Druilhe P, Guguen-Guilliano C, Bayard P, Soeun V, Datry A, Gentilini M, 1984. Hepatocytes as feeder-layers for in vitro cultivation of *Plasmodium falciparum* blood stages. *Trans R Soc Trop Med Hyg*, 78: 330-334.
106. Phillips RS, Trenholme KR, MacDougall LM, Pyott A, MacLean SA, Walker E, 1987. Adaption of *Plasmodium falciparum* to continuous culture using human and murine feeder cells. *Med Sci Res*, 15: 1167-1168.
107. Vanderberg JP, 1988. In vitro cultivation of

- malaria parasites: sporogonic stages. In: *Malaria. Principles and Practice of Malariology, Vol 1*, Wernsdorfer WH, McGregor I (Editors). Edinburgh: Churchill Livingstone, pp 331-347.
108. Ono T, Ohnishi Y, Nagamune K, Kano M, 1993. Gametocytogenesis induction by Berenil in cultured *Plasmodium falciparum*. *Exp Parasitol*, 77: 74-73.
109. Ponnudurai T, Meuwissen JHET, Leeuwenberg ADEM, Verhave JP, Lensen AHW, 1982. The production of mature gametocytes of *Plasmodium falciparum* in continuous cultures of different isolates infective to mosquitoes. *Trans R Soc Trop Med Hyg*, 76: 242-250.
110. Freese JA, Sharp BL, Ridl FC, Markus MB, 1988. *In vitro* cultivation of southern African strains of *Plasmodium falciparum* and gametocytogenesis. *S Afr Med J*, 73: 720-722.
111. Ponnudurai T, Lensen AHW, Meis JFGM, Meuwissen JHETH, 1986. Synchronization of *Plasmodium falciparum* gametocytes using an automated suspension culture system. *Parasitology*, 93: 263-274.
112. NF54 originally established in culture by T. Ponnudurai.
113. Rosario V, 1981. Cloning of naturally occurring mixed infections of malaria parasites. *Science*, 212: 1037-1038.

114. Beale GH, Thaithong S, Siripool N, 1991. Isolation of clones of *Plasmodium falciparum* by micromanipulation. *Trans R Soc Trop Med Hyg*, 85: 37.
115. Robson KJH, Walliker D, Creasey A, McBride J, Beale G, Wilson RJM, 1992. Cross-contamination of *Plasmodium* cultures. *Parasitol Today*, 8: 38-39.
116. Wooden J, Kyes S, Sibley CH, 1993. PCR and strain identification in *Plasmodium falciparum*. *Parasitol Today*, 9: 303-305.
117. Carter R, 1970. Enzyme variation in *Plasmodium berghei*. *Trans R Soc Trop Med Hyg*, 64: 401-406.
118. Carter R, 1973. Enzyme variation in *Plasmodium berghei* and *Plasmodium vinckei*. *Parasitology*, 66: 297-307.
119. Carter R, McGregor IA, 1973. Enzyme variation in *Plasmodium falciparum* in the Gambia. *Trans R Soc Trop Med Hyg*, 67: 830-837.
120. Carter R, Voller A, 1975. The distribution of enzyme variation in populations of *Plasmodium falciparum* in Africa. *Trans R Soc Trop Med Hyg*, 69: 371-376.
121. Beale GH, Walliker D, 1988. Genetics of malaria parasites. In: *Malaria. Principles and Practice of Malariology*, Vol 1, Wernsdorfer WH, McGregor I (editors). Edinburgh: Churchill Livingstone, pp 379-393.
122. Anders RF, 1991. Antigenic diversity in

- Plasmodium falciparum*. *Acta Leidensia*, 60: 57-67.
123. Kemp DJ, Cowman AF, Walliker D, 1990. Genetic diversity in *Plasmodium falciparum*. *Adv Parasitol*, 29: 75-149.
124. Kemp DJ, 1992. Antigenic diversity and variation in blood stages of *Plasmodium falciparum*. *Immunol Cell Biol*, 70: 201-207.
125. McCrutchén TF, de la Cruz VF, Good MF, Wellem's TE, 1988. Antigenic diversity in *Plasmodium falciparum*. *Prog Allergy*, 41: 173-192.
126. Miller LH, Roberts T, Shahabuddin M, McCrutchén TF, 1993. Analysis of sequence diversity in the *Plasmodium falciparum* merozoite surface protein (MSP-1). *Mol Biochem Parasitol*, 59: 1-14.
127. Shiff CJ, Premji Z, Minjas JN, 1993. The rapid manual ParaSight test. A new diagnostic tool for *Plasmodium falciparum* infection. *Trans R Soc Trop Med Hyg*, 87: 646-648.
128. Roberts DJ, Biggs B-A, Brown G, Newbold CI, 1993. Protection, pathogenesis and phenotypic plasticity in *Plasmodium falciparum* malaria. *Parasitol Today*, 9: 281-286.
129. Biggs B-A, Gooze L, Wycherley K, Wollish W, Southwell B, Leech JH, Brown GV, 1991. Antigenic variation in *Plasmodium falciparum*. *Proc Natl Acad Sci USA*, 88: 9171-9174.
130. Roberts DJ, Craig AG, Berend't AR, Pinches R, Nash G, Marsh K, Newbold CI. Rapid switching to

- multiple antigenic and adhesive phenotypes in malaria. *Nature*, 357: 689-692.
131. Nussenzweig V, Nussenzweig RS, 1989. Rationale for the development of an engineered sporozoite malaria vaccine. *Adv Immunol*, 45: 283-334.
132. Good MF, Saul A, Graves FM, 1992. Malaria vaccines. *Biotechnology*, 20: 69-98.
133. Hoffman SL, Nussenzweig V, Sadoff JC, Nussenzweig RS, 1991. Progress toward malaria preerythrocytic vaccines. *Science*, 252: 520-521.
134. Alano P, 1991. *Plasmodium* sexual stage antigens. *Parasitol Today*, 7: 199-203.
135. Howard RJ, Pasloske BL, 1993. Target antigens for asexual malaria vaccine development. *Parasitol Today*, 9: 369-372.
136. Moreno A, Patarroyo ME, 1989. Development of an asexual blood stage malaria vaccine. *Blood*, 74: 537-546.
137. Valero MV, Amador LR, Galindo C, Figueroa J, Bello MS, Murillo LA, Mora AL, Patarroyo G, Rocha CL, Rojas M, Aponte JJ, Sarmiento LE, Lozada DM, Coronell CG, Ortega NM, Rosas JE, Alonso PL, Patarroyo ME, 1993. Vaccination with SPf66, a chemically synthesised vaccine, against *Plasmodium falciparum* malaria in Colombia. *Lancet*, 341: 705-710.
138. Targett GAT, 1992. SPf66, a candidate synthetic malaria vaccine: immunogenicity versus

- protection. *Parasitol Today*, 8: 354-355.
139. Makler MT, Ries JM, Williams JA, Bancroft JE, Piper RC, Gibbins BL, Hinrichs DJ, 1993. Parasite lactate dehydrogenase as an assay for *Plasmodium falciparum* drug sensitivity. *Am J Trop Med Hyg*, 48: 739-741.
140. Rickman LS, Long GW, Oberst R, Cabanban A, Sangalang R, Smith JI, Chulay JD, Hoffman SL, 1989. Rapid diagnosis of malaria by acridine orange staining of centrifuged parasites. *Lancet*, i: 68-71.
141. Makler MT, Ries IK, Ries J, Horton RJ, Hinrichs DJ, 1991. Detection of *Plasmodium falciparum* infection with the fluorescent dye, benzothio-carboxypurine. *Am J Trop Med Hyg*, 44: 11-16.
142. Makler MT, 1992. Fluorescent microscope objective. *Trans R Soc Trop Med Hyg*, 86: 108.
143. Kawamoto F, 1991. Rapid diagnosis of malaria by fluorescence microscopy with light microscope and interference filter. *Lancet*, 337: 200-202.
144. Pammenter MD, 1988. Techniques for the diagnosis of malaria. *S Afr Med J*, 74: 55-57.
145. Avidor B, Golenser J, Sulitzeanu D, 1992. Detection of *Plasmodium falciparum* by a sensitive ELISA and identification of antigens using a monoclonal antibody crossreacting with *P. berghei*. *S Afr J Sci*, 88: 110-113.
146. Voller A, Draper CC, 1982. Immunodiagnosis and

- sero-epidemiology of malaria. *Br Med Bull*, 38: 173-177.
147. Snounou G, Pinheiro L, Gonçalves A, Fonseca L, Dias F, Brown KN, do Rosario VE, 1993. The importance of sensitive detection of malaria parasites in the human and insect hosts in epidemiological studies, as shown by the analysis of field samples from Guinea Bissau. *Trans R Soc Trop Med Hyg*, 87: 649-653.
148. Ginsburg H, 1991. Enhancement of the antimalarial effect of chloroquine on drug-resistant parasite strains - a critical examination of the reversal of multidrug resistance. *Exp Parasitol*, 73: 227-232.
149. Karcz S, Cowman AF, 1991. Similarities and differences between the multidrug resistance phenotype of mammalian tumor cells and chloroquine resistance in *Plasmodium falciparum*. *Exp Parasitol*, 73: 233-240.
150. Martin SK, 1993. Chloroquine-resistant *Plasmodium falciparum* and the MDR phenotype. *Parasitol Today*, 9: 278-279.
151. Martin SK, Oduola AM, Milhous WK, 1987. Reversal of chloroquine resistance in *Plasmodium falciparum* by verapamil. *Science*, 235: 899-901.
152. Krogstad DJ, Gluzman IY, Kyle DE, Oduola AM, Martin SK, Milhous WK, Schlesinger PH, 1987. Efflux of chloroquine from *Plasmodium falciparum*:

- mechanism of chloroquine resistance. *Science*, 238: 1283-1285.
153. Bray PG, Howells RE, Ritchie GY, Ward SA, 1992. Rapid chloroquine efflux phenotype in both chloroquine-sensitive and chloroquine-resistant *Plasmodium falciparum*. A correlation of chloroquine sensitivity with energy-dependent drug accumulation. *Biochem Pharmacol*, 44: 1317-1324.
154. Foote SJ, Thompson JK, Cowman AF, Kemp DJ, 1989. Amplification of the multidrug resistance gene in some chloroquine-resistant isolates of *P. falciparum*. *Cell*, 57: 921-930.
155. Wilson CM, Serrano AE, Wasley A, Bogenschutz MP, Shankar AH, Wirth DF, 1989. Amplification of a gene related to mammalian *mdr* genes in drug-resistant *Plasmodium falciparum*. *Science*, 244: 1184-1186.
156. Zalis MG, Wilson CM, Zhang Y, Wirth DF, 1993. Characterization of the *pfmdr2* gene for *Plasmodium falciparum*. *Molec Biochem Parasitol*, 62: 83-92.
157. Wellem's TE, Panton LJ, Gluzman IY, do Rosario VE, Gwadz RW, Walker-Jonah A, Krogstad DJ, 1990. Chloroquine resistance not linked to *mdr*-like gene in a *Plasmodium falciparum* cross. *Nature*, 345: 253-255.
158. Barnes DA, Foote SJ, Galatis D, Kemp DJ, Cowman

- AF, 1992. Selection for high-level chloroquine resistance results in deamplification of the *pfmdr1* gene and increased sensitivity to mefloquine in *Plasmodium falciparum*. *EMBO J*, 11: 3067-3075.
159. Frean JA, Awad El Kariem FM, Warhurst DC, Miles MA, 1992. Rapid detection of *pfmdr1* mutations in chloroquine-resistant *Plasmodium falciparum* malaria by polymerase chain reaction analysis of blood spots. *Trans R Soc Trop Med Hyg*, 86: 29-30.
160. Awad-El-Kariem FM, Miles MA, Warhurst DC, 1992. Chloroquine-resistant *Plasmodium falciparum* isolates from Sudan lack two mutations in the *pfmdr1* gene thought to be associated with chloroquine resistance. *Trans R Soc Trop Med Hyg*, 86: 587-589.
161. Wellems TE, Walker-Jonah A, Panton LJ, 1991. Genetic mapping of the chloroquine-resistance locus on *Plasmodium falciparum* chromosome 7. *PNAS USA*, 88: 3382-3386.
162. Wellems TE, 1991. Molecular genetics of drug resistance in *Plasmodium falciparum* malaria. *Parasitol Today*, 7: 110-112.
163. Peterson DS, Walliker D, Wellems TE, 1988. Evidence that point mutations in dihydrofolate reductase-thymidylate synthase confer resistance to pyrimethamine in *falciparum* malaria. *PNAS USA*, 85: 9114-9118.

164. Gyang FN, Peterson DS, Wellems TE, 1992. *Plasmodium falciparum*: Rapid detection of dihydrofolate reductase mutations that confer resistance to cycloguanil and pyrimethamine. *Exp Parasitol*, 74: 470-472.
165. Wernsdorfer WH, Trigg PI, 1988. Recent progress of malaria research: chemotherapy. In: *Malaria. Principals and Practice of Malariology*, Vol 2, Wernsdorfer WH, McGregor I (editors). Edinburgh: Churchill Livingstone, pp 1569-1674.
166. White NJ, 1994. Artemisinin: current status. *Trans R Soc Trop Med Hyg*, 88 (Suppl. 1): 3-4.
167. Fu S, Xiao S-H, 1991. Pyronaridine: a new antimalarial drug. *Parasitol Today*, 7: 310-313.
168. Brasseur P, Bitsindou P, Moyou RS, Eggelte TA, Samba G, Penchenier L, Druilhe P, 1993. Fast emergence of *Plasmodium falciparum* resistance to halofantrine. *Lancet*, 341: 901-902.
169. Wildling E, Winkler S, Brandts C, Jenne L, Graninger W, Wernsdorfer WH, Bienzle U, Kremsner PG, 1993. Halofantrine sensitivity. *Lancet*, 342: 55-56.
170. Basco LK, le Bras J, 1993. *In vitro* activity of artemisinin derivatives against African isolates and clones of *Plasmodium falciparum*. *Am J Trop Med Hyg*, 49: 301-307.
171. Warsame M, Wernsdorfer WH, Payne D, Björkman A. Positive relationship between the response of

- Plasmodium falciparum* to chloroquine and pyronaridine. *Trans R Soc Trop Med Hyg*, 85: 570-571.
172. Phillipson DJ, 1994. Natural products as drugs. *Trans R Soc Trop Med Hyg*, 88 (Suppl 1): 17-19.
173. Goldberg DE, Slater AFG, 1992. The pathway of hemoglobin degradation in malaria parasites. *Parasitol Today*, 8: 280-283.
174. Gero AM, Upston JM, 1992. Altered membrane permeability: a new approach to malaria chemotherapy. *Parasitol Today*, 8: 283-286.
175. Heppner DG, Hallaway PE, Kontoghiorghes GJ, Eaton JW, 1988. Antimalarial properties of orally active iron chelators. *Blood*, 72: 358-361.
176. van Zyl RL, Havlik I, Monteagudo FSE, 1992. The combined effect of iron chelating agents and classic antimalarials on the *in vitro* growth of *Plasmodium falciparum*. *J Antimicrob Chemother*, 30: 273-278.
177. Gordeuk VR, Thuma PE, Brittenham GM, Biemba G, Zulu S, Simwanza G, Kalense P, M'hango A, Parry D, Poltera AA, Aikawa M, 1993. Iron chelation as a chemotherapeutic strategy for *falciparum* malaria. *Am J Trop Med Hyg*, 48: 193-197.
178. van Zyl RL, Havlik I, Hempelmann E, MacPhail AP, McNamara L, 1993. Malaria pigment and extracellular iron. Possible target for iron chelating agents. *Biochem Pharmacol*, 45: 1431-

- 1436.
179. Golenser J, Chevion M, 1989. Oxidant stress and malaria: Host-parasite interrelationships in normal and abnormal erythrocytes. *Sems Hematol*, 26: 313-325.
180. Golenser J, Marva E, Chevion M, 1991. The survival of *Plasmodium* under oxidant stress. *Parasitol Today*, 7: 142-146.
181. O'Farrell PH, 1975. High resolution two-dimensional electrophoresis of proteins. *J Biol Chem*, 250: 4007-4021.
182. Tait A, 1981. Analysis of protein variation in *Plasmodium falciparum* by two-dimensional gel electrophoresis. *Mol Biochem Parasitol*, 2: 205-218.
183. Goldring JD, Molyneux ME, Taylor T, Wirima J, Hommel M, 1992. *Plasmodium falciparum*: diversity of isolates from Malawi in their cytoadherence to melanoma cells and monocytes *in vitro*. *Br J Haematol*, 81: 413-418.
184. Babiker HA, Creasey AM, Bayoumi RAL, Walliker D, Arnot DE, 1991. Genetic diversity of *Plasmodium falciparum* in a village in eastern Sudan. 2. Drug resistance, molecular karyotypes and the *mdr 1* genotype of recent isolates. *Trans R Soc Trop Med Hyg*, 85: 578-583.
185. Hughes MA, Hommel M, Crampton JM, 1990. The use of biotin-labelled, synthetic DNA oligomers for

the detection and identification of *Plasmodium falciparum*. *Parasitol*, 100: 383-387.

186. Mercereau-Puijalon O, Jacquemot C, Sarthou J-L, 1991. A study of the genomic diversity of *Plasmodium falciparum* in Senegal. 1. Typing by Southern blot analysis. *Acta Tropica*, 49: 281-292.
187. Mercereau-Puijalon O, Fandeur T, Bonnefoy S, Jacquemot C, Sarthou J-L, 1991. A study of the genomic diversity of *Plasmodium falciparum* in Senegal. 2. Typing by the use of the polymerase chain reaction. *Acta Tropica*, 49: 293-304.

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