

References

1. Marsh K. Malaria disaster in Africa. *Lancet*. 1998;352(9132):924.
2. Jana S, Paliwal J. Novel molecular targets for antimalarial chemotherapy. *International journal of antimicrobial agents*. 2007;30(1):4-10.
3. White NJ. Antimalarial drug resistance. *The Journal of clinical investigation*. 2004;113(8):1084-92.
4. Daneshvar C, Davis TM, Cox-Singh J, Rafa'ee MZ, Zakaria SK, Divis PC, et al. Clinical and laboratory features of human *Plasmodium knowlesi* infection. *Clinical infectious diseases: an official publication of the Infectious Diseases Society of America*. 2009;49(6):852-60.
5. Thimasarn K, Jatapadma S, Vijaykadga S, Sirichaisinthop J, Wongsrichanalai C. Epidemiology of Malaria in Thailand. *Journal of travel medicine*. 1995;2(2):59-65.
6. Nzila A. Inhibitors of de novo folate enzymes in *Plasmodium falciparum*. *Drug discovery today*. 2006;11(19-20):939-44.
7. Djimde A, Doumbo OK, Cortese JF, Kayentao K, Doumbo S, Diourte Y, et al. A molecular marker for chloroquine-resistant *falciparum* malaria. *The New England journal of medicine*. 2001;344(4):257-63.
8. Meyer CG, May J, Arez AP, Gil JP, Do Rosario V. Genetic diversity of *Plasmodium falciparum*: asexual stages. *Tropical medicine & international health : TM & IH*. 2002;7(5):395-408.
9. Peterson DS, Walliker D, Wellems TE. Evidence that a point mutation in dihydrofolate reductase-thymidylate synthase confers resistance to pyrimethamine in *falciparum* malaria. *Proceedings of the National Academy of Sciences of the United States of America*. 1988;85(23):9114-8.
10. Curtis J, Duraisingh MT, Trigg JK, Mbwana H, Warhurst DC, Curtis CF. Direct evidence that asparagine at position 108 of the *Plasmodium falciparum* dihydrofolate reductase is involved in resistance to antifolate drugs in Tanzania. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 1996;90(6):678-80.

11. Plowe CV, Djimde A, Wellems TE, Diop S, Kouriba B, Doumbo OK. Community pyrimethamine-sulfadoxine use and prevalence of resistant *Plasmodium falciparum* genotypes in Mali: a model for deterring resistance. *The American journal of tropical medicine and hygiene*. 1996;55(5):467-71.
12. Warhurst DC. Resistance to antifolates in *Plasmodium falciparum*, the causative agent of tropical malaria. *Science progress*. 2002;85(Pt 1):89-111.
13. McCollum AM, Poe AC, Hamel M, Huber C, Zhou Z, Shi YP, et al. Antifolate resistance in *Plasmodium falciparum*: multiple origins and identification of novel dhfr alleles. *The Journal of infectious diseases*. 2006;194(2):189-97.
14. White NJ. Assessment of the pharmacodynamic properties of antimalarial drugs *in vivo*. *Antimicrobial agents and chemotherapy*. 1997;41(7):1413-22.
15. Douglas NM, Anstey NM, Angus BJ, Nosten F, Price RN. Artemisinin combination therapy for *vivax* malaria. *The Lancet Infectious diseases*. 2010;10(6):405-16.
16. Noedl H, Se Y, Schaecher K, Smith BL, Socheat D, Fukuda MM, et al. Evidence of artemisinin-resistant malaria in western Cambodia. *The New England journal of medicine*. 2008;359(24):2619-20.
17. Dondorp AM, Nosten F, Yi P, Das D, Phyo AP, Tarning J, et al. Artemisinin resistance in *Plasmodium falciparum* malaria. *The New England journal of medicine*. 2009;361(5):455-67.
18. Phyo AP, Nkhoma S, Stepniewska K, Ashley EA, Nair S, McGready R, et al. Emergence of artemisinin-resistant malaria on the western border of Thailand: a longitudinal study. *Lancet*. 2012;379(9830):1960-6.
19. Phillips RS. Current status of malaria and potential for control. *Clinical microbiology reviews*. 2001;14(1):208-26.
20. Parry J. WHO combats counterfeit malaria drugs in Asia. *Bmj*. 2005;330(7499):1044.
21. Esposito F, Lombardi S, Modiano D, Zavala F, Reeme J, Lamizana L, et al. Prevalence and levels of antibodies to the circumsporozoite protein of *Plasmodium falciparum* in an endemic area and their relationship to resistance

- against malaria infection. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 1988;82(6):827-32.
22. Riley EM, Allen SJ, Wheeler JG, Blackman MJ, Bennett S, Takacs B, et al. Naturally acquired cellular and humoral immune responses to the major merozoite surface antigen (*PfMSP1*) of *Plasmodium falciparum* are associated with reduced malaria morbidity. *Parasite immunology*. 1992;14(3):321-37.
 23. Pied S, Tabone MD, Chatellier G, Marussig M, Jardel C, Nosten F, et al. Non specific resistance against malaria pre-erythrocytic stages: involvement of acute phase proteins. *Parasite*. 1995;2(3):263-8.
 24. Gregson A, Plowe CV. Mechanisms of resistance of malaria parasites to antifolates. *Pharmacological reviews*. 2005;57(1):117-45.
 25. Jarrett JT, Amaratunga M, Drennan CL, Scholten JD, Sands RH, Ludwig ML, et al. Mutations in the B12-binding region of methionine synthase: how the protein controls methylcobalamin reactivity. *Biochemistry*. 1996;35(7):2464-75.
 26. Radfar A, Mendez D, Moneriz C, Linares M, Marin-Garcia P, Puyet A, et al. Synchronous culture of *Plasmodium falciparum* at high parasitemia levels. *Nature protocols*. 2009;4(12):1899-915.
 27. Schlitzer M. Antimalarial drugs - what is in use and what is in the pipeline. *Archiv der Pharmazie*. 2008;341(3):149-63.
 28. Croft S. Antimalarial Chemotherapy: Mechanisms of Action, Resistance and New Directions in Drug Discovery. *Drug discovery today*. 2001;6(22):1151.
 29. O'Neill PM, Ward SA, Berry NG, Jeyadevan JP, Biagini GA, Asadollaly E, et al. A medicinal chemistry perspective on 4-aminoquinoline antimalarial drugs. *Current topics in medicinal chemistry*. 2006;6(5):479-507.
 30. Bray PG, Ward SA, O'Neill PM. Quinolines and artemisinin: chemistry, biology and history. *Current topics in microbiology and immunology*. 2005;295:3-38.
 31. Sanchez CP, McLean JE, Stein W, Lanzer M. Evidence for a substrate specific and inhibitable drug efflux system in chloroquine resistant *Plasmodium falciparum* strains. *Biochemistry*. 2004;43(51):16365-73.

32. Martin RE, Kirk K. The malaria parasite's chloroquine resistance transporter is a member of the drug/metabolite transporter superfamily. *Molecular biology and evolution*. 2004;21(10):1938-49.
33. Bray PG, Martin RE, Tilley L, Ward SA, Kirk K, Fidock DA. Defining the role of *PfCRT* in *Plasmodium falciparum* chloroquine resistance. *Molecular microbiology*. 2005;56(2):323-33.
34. Wellems TE. Transporter of a malaria catastrophe. *Nature medicine*. 2004;10(11):1169-71.
35. Ginsburg H. Should chloroquine be laid to rest? *Acta tropica*. 2005;96(1):16-23.
36. Pradines B, Tall A, Ramiandrasoa F, Spiegel A, Sokhna C, Fusai T, et al. *In vitro* activity of iron-binding compounds against Senegalese isolates of *Plasmodium falciparum*. *The Journal of antimicrobial chemotherapy*. 2006;57(6):1093-9.
37. Baird JK, Schwartz E, Hoffman SL. Prevention and treatment of *vivax* malaria. *Current infectious disease reports*. 2007;9(1):39-46.
38. Taylor WR, White NJ. Antimalarial drug toxicity: a review. *Drug safety*. 2004;27(1):25-61.
39. O'Neill PM, Bray PG, Hawley SR, Ward SA, Park BK. 4-Aminoquinolines--past, present, and future: a chemical perspective. *Pharmacology & therapeutics*. 1998;77(1):29-58.
40. Tingle MD, Jewell H, Maggs JL, O'Neill PM, Park BK. The bioactivation of amodiaquine by human polymorphonuclear leucocytes *in vitro*: chemical mechanisms and the effects of fluorine substitution. *Biochemical pharmacology*. 1995;50(7):1113-9.
41. Naisbitt DJ, Ruscoe JE, Williams D, O'Neill PM, Pirmohamed M, Park BK. Disposition of amodiaquine and related antimalarial agents in human neutrophils: implications for drug design. *The Journal of pharmacology and experimental therapeutics*. 1997;280(2):884-93.
42. Olliaro P, Nevill C, LeBras J, Ringwald P, Mussano P, Garner P, et al. Systematic review of amodiaquine treatment in uncomplicated malaria. *Lancet*. 1996;348(9036):1196-201.

43. Maitland K, Makanga M, Williams TN. *Falciparum* malaria: current therapeutic challenges. *Current opinion in infectious diseases*. 2004;17(5):405-12.
44. Sirima SB, Gansane A. Artesunate-amodiaquine for the treatment of uncomplicated malaria. *Expert opinion on investigational drugs*. 2007;16(7):1079-85.
45. Hoppe HC, van Schalkwyk DA, Wiehart UI, Meredith SA, Egan J, Weber BW. Antimalarial quinolines and artemisinin inhibit endocytosis in *Plasmodium falciparum*. *Antimicrobial agents and chemotherapy*. 2004;48(7):2370-8.
46. Anderson TJ, Nair S, Qin H, Singlam S, Brockman A, Paiphun L, et al. Are transporter genes other than the chloroquine resistance locus (*Pfcr*) and multidrug resistance gene (*Pfmdr*) associated with antimalarial drug resistance? *Antimicrobial agents and chemotherapy*. 2005;49(6):2180-8.
47. Uhlemann AC, Ramharter M, Lell B, Kremsner PG, Krishna S. Amplification of *Plasmodium falciparum* multidrug resistance gene 1 in isolates from Gabon. *The Journal of infectious diseases*. 2005;192(10):1830-5.
48. Duraisingh MT, Refour P. Multiple drug resistance genes in malaria -- from epistasis to epidemiology. *Molecular microbiology*. 2005;57(4):874-7.
49. Pasvol G. Management of severe malaria: interventions and controversies. *Infectious disease clinics of North America*. 2005;19(1):211-40.
50. Wongsrichanalai C, Pickard AL, Wernsdorfer WH, Meshnick SR. Epidemiology of drug-resistant malaria. *The Lancet Infectious diseases*. 2002;2(4):209-18.
51. Baird JK. Effectiveness of antimalarial drugs. *The New England journal of medicine*. 2005;352(15):1565-77.
52. Suh KN, Kain KC, Keystone JS. Malaria. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. 2004;170(11):1693-702.
53. Ringwald P, Eboumbou EC, Bickii J, Basco LK. *In vitro* activities of pyronaridine, alone and in combination with other antimalarial drugs, against *Plasmodium falciparum*. *Antimicrobial agents and chemotherapy*. 1999;43(6):1525-7.
54. Adjuik M, Agnamey P, Babiker A, Borrmann S, Brasseur P, Cisse M, et al. Amodiaquine-artesunate versus amodiaquine for uncomplicated *Plasmodium*

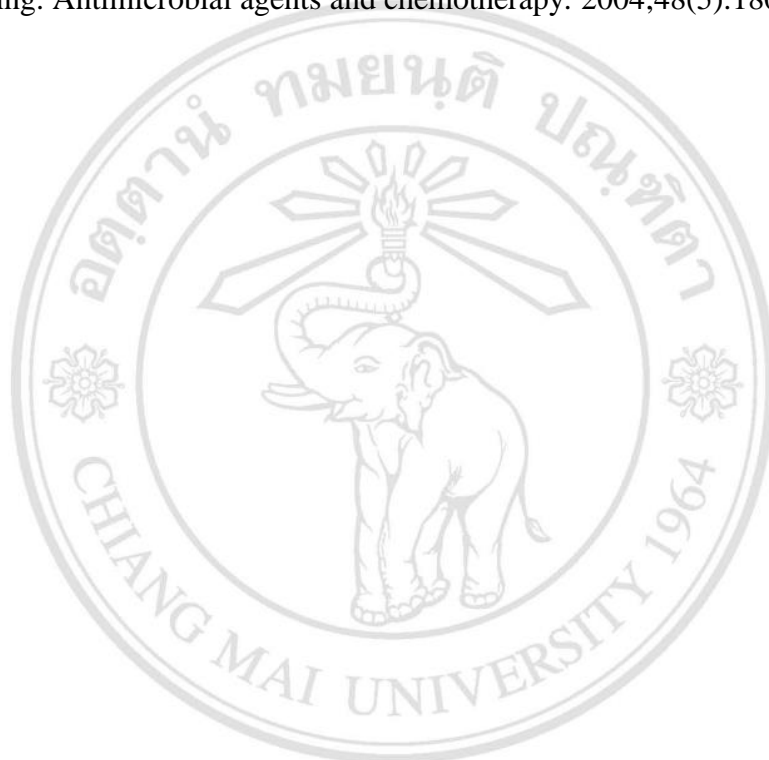
- falciparum* malaria in African children: a randomised, multicentre trial. *Lancet*. 2002;359(9315):1365-72.
55. Price RN, Uhlemann AC, Brockman A, McGready R, Ashley E, Phaipun L, et al. Mefloquine resistance in *Plasmodium falciparum* and increased *Pfmdr1* gene copy number. *Lancet*. 2004;364(9432):438-47.
 56. Fivelman QL, Adagu IS, Warhurst DC. Modified fixed-ratio isobologram method for studying *in vitro* interactions between atovaquone and proguanil or dihydroartemisinin against drug-resistant strains of *Plasmodium falciparum*. *Antimicrobial agents and chemotherapy*. 2004;48(11):4097-102.
 57. Toovey S, Jamieson A, Nettleton G. Successful co-artemether (artemether-lumefantrine) clearance of *falciparum* malaria in a patient with severe cholera in Mozambique. *Travel medicine and infectious disease*. 2003;1(3):177-9.
 58. Ajdukiewicz KM, Ong EL. Management of vivax malaria with low sensitivity to primaquine. *The Journal of infection*. 2007;54(3):209-11.
 59. Hill DR, Baird JK, Parise ME, Lewis LS, Ryan ET, Magill AJ. Primaquine: report from CDC expert meeting on malaria chemoprophylaxis I. *The American journal of tropical medicine and hygiene*. 2006;75(3):402-15.
 60. Plowe CV, Doumbo OK, Djimde A, Kayentao K, Diourte Y, Doumbo SN, et al. Chloroquine treatment of uncomplicated *Plasmodium falciparum* malaria in Mali: parasitologic resistance versus therapeutic efficacy. *The American journal of tropical medicine and hygiene*. 2001;64(5-6):242-6.
 61. Nzila A. The past, present and future of antifolates in the treatment of *Plasmodium falciparum* infection. *The Journal of antimicrobial chemotherapy*. 2006;57(6):1043-54.
 62. Ferone R. Folate metabolism in malaria. *Bulletin of the World Health Organization*. 1977;55(2-3):291-8.
 63. Gritzmacher CA, Reese RT. Protein and nucleic acid synthesis during synchronized growth of *Plasmodium falciparum*. *Journal of bacteriology*. 1984;160(3):1165-7.
 64. Krudsood S, Imwong M, Wilairatana P, Pukrittayakamee S, Nonprasert A, Snounou G, et al. Artesunate-dapsone-proguanil treatment of *falciparum* malaria:

- genotypic determinants of therapeutic response. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 2005;99(2):142-9.
65. Yuvaniyama J, Chitnumsub P, Kamchonwongpaisan S, Vanichtanankul J, Sirawaraporn W, Taylor P, et al. Insights into antifolate resistance from malarial DHFR-TS structures. *Nature structural biology*. 2003;10(5):357-65.
 66. Parenti MD, Pacchioni S, Ferrari AM, Rastelli G. Three-dimensional quantitative structure-activity relationship analysis of a set of *Plasmodium falciparum* dihydrofolate reductase inhibitors using a pharmacophore generation approach. *Journal of medicinal chemistry*. 2004;47(17):4258-67.
 67. Gatton ML, Martin LB, Cheng Q. Evolution of resistance to sulfadoxine-pyrimethamine in *Plasmodium falciparum*. *Antimicrobial agents and chemotherapy*. 2004;48(6):2116-23.
 68. Sirichaiwat C, Intaraudom C, Kamchonwongpaisan S, Vanichtanankul J, Thebtaranonth Y, Yuthavong Y. Target guided synthesis of 5-benzyl-2,4-diamonopyrimidines: their antimalarial activities and binding affinities to wild type and mutant dihydrofolate reductases from *Plasmodium falciparum*. *Journal of medicinal chemistry*. 2004;47(2):345-54.
 69. Triglia T, Menting JG, Wilson C, Cowman AF. Mutations in dihydropteroate synthase are responsible for sulfone and sulfonamide resistance in *Plasmodium falciparum*. *Proceedings of the National Academy of Sciences of the United States of America*. 1997;94(25):13944-9.
 70. Nzila-Mounda A, Mberu EK, Sibley CH, Plowe CV, Winstanley PA, Watkins WM. Kenyan *Plasmodium falciparum* field isolates: correlation between pyrimethamine and chlorcycloguanil activity *in vitro* and point mutations in the dihydrofolate reductase domain. *Antimicrobial agents and chemotherapy*. 1998;42(1):164-9.
 71. Kublin JG, Dzinjalama FK, Kamwendo DD, Malkin EM, Cortese JF, Martino LM, et al. Molecular markers for failure of sulfadoxine-pyrimethamine and chlorproguanil-dapsone treatment of *Plasmodium falciparum* malaria. *The Journal of infectious diseases*. 2002;185(3):380-8.

72. Foote SJ, Galatis D, Cowman AF. Amino acids in the dihydrofolate reductase-thymidylate synthase gene of *Plasmodium falciparum* involved in cycloguanil resistance differ from those involved in pyrimethamine resistance. Proceedings of the National Academy of Sciences of the United States of America. 1990;87(8):3014-7.
73. Plowe CV, Cortese JF, Djimde A, Nwanyanwu OC, Watkins WM, Winstanley PA, et al. Mutations in *Plasmodium falciparum* dihydrofolate reductase and dihydropteroate synthase and epidemiologic patterns of pyrimethamine-sulfadoxine use and resistance. The Journal of infectious diseases. 1997;176(6):1590-6.
74. Triglia T, Wang P, Sims PF, Hyde JE, Cowman AF. Allelic exchange at the endogenous genomic locus in *Plasmodium falciparum* proves the role of dihydropteroate synthase in sulfadoxine-resistant malaria. The EMBO journal. 1998;17(14):3807-15.
75. Khalil I, Ronn AM, Alifrangis M, Gabar HA, Satti GM, Bygbjerg IC. Dihydrofolate reductase and dihydropteroate synthase genotypes associated with *in vitro* resistance of *Plasmodium falciparum* to pyrimethamine, trimethoprim, sulfadoxine, and sulfamethoxazole. The American journal of tropical medicine and hygiene. 2003;68(5):586-9.
76. Yuthavong Y, Tarnchompoo B, Vilaivan T, Chitnumsub P, Kamchonwongpaisan S, Charman SA, et al. Malarial dihydrofolate reductase as a paradigm for drug development against a resistance-compromised target. Proceedings of the National Academy of Sciences of the United States of America. 2012;109(42):16823-8.
77. Cao XT, Bethell DB, Pham TP, Ta TT, Tran TN, Nguyen TT, et al. Comparison of artemisinin suppositories, intramuscular artesunate and intravenous quinine for the treatment of severe childhood malaria. Transactions of the Royal Society of Tropical Medicine and Hygiene. 1997;91(3):335-42.
78. Haynes RK, Krishna S. Artemisinins: activities and actions. Microbes and infection / Institut Pasteur. 2004;6(14):1339-46.

79. Krishna S, Uhlemann AC, Haynes RK. Artemisinins: mechanisms of action and potential for resistance. *Drug resistance updates : reviews and commentaries in antimicrobial and anticancer chemotherapy*. 2004;7(4-5):233-44.
80. Eckstein-Ludwig U, Webb RJ, Van Goethem ID, East JM, Lee AG, Kimura M, et al. Artemisinins target the SERCA of *Plasmodium falciparum*. *Nature*. 2003;424(6951):957-61.
81. Golenser J, Waknine JH, Krugliak M, Hunt NH, Grau GE. Current perspectives on the mechanism of action of artemisinins. *International journal for parasitology*. 2006;36(14):1427-41.
82. Woodrow CJ, Haynes RK, Krishna S. Artemisinins. *Postgraduate medical journal*. 2005;81(952):71-8.
83. Woodrow CJ, Krishna S. Antimalarial drugs: recent advances in molecular determinants of resistance and their clinical significance. *Cellular and molecular life sciences : CMLS*. 2006;63(14):1586-96.
84. Uhlemann AC, Krishna S. Antimalarial multi-drug resistance in Asia: mechanisms and assessment. *Current topics in microbiology and immunology*. 2005;295:39-53.
85. Jambou R, Legrand E, Niang M, Khim N, Lim P, Volney B, et al. Resistance of *Plasmodium falciparum* field isolates to in-vitro artemether and point mutations of the SERCA-type *PfATPase6*. *Lancet*. 2005;366(9501):1960-3.
86. Vaidya AB. Mitochondrial and plastid functions as antimalarial drug targets. *Current drug targets Infectious disorders*. 2004;4(1):11-23.
87. Vaidya AB, Mather MW. A post-genomic view of the mitochondrion in malaria parasites. *Current topics in microbiology and immunology*. 2005;295:233-50.
88. Kessl JJ, Lange BB, Merbitz-Zahradnik T, Zwicker K, Hill P, Meunier B, et al. Molecular basis for atovaquone binding to the cytochrome bc1 complex. *The Journal of biological chemistry*. 2003;278(33):31312-8.
89. Ashley EA, White NJ. Artemisinin-based combinations. *Current opinion in infectious diseases*. 2005;18(6):531-6.
90. Lell B, Kremsner PG. Clindamycin as an antimalarial drug: review of clinical trials. *Antimicrobial agents and chemotherapy*. 2002;46(8):2315-20.

91. Trager W, Jensen JB. Human malaria parasites in continuous culture. *Science*. 1976;193(4254):673-5.
92. Lambros C, Vanderberg JP. Synchronization of *Plasmodium falciparum* erythrocytic stages in culture. *The Journal of parasitology*. 1979;65(3):418-20.
93. Smilkstein M, Sriwilaijaroen N, Kelly JX, Wilairat P, Riscoe M. Simple and inexpensive fluorescence-based technique for high-throughput antimalarial drug screening. *Antimicrobial agents and chemotherapy*. 2004;48(5):1803-6.



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