

Francis W. Muregi, PhD

Director, Research and Development & Senior Lecturer, Department of Biological Sciences



Work Experience

I hold a PhD in Medical Sciences from Hamamatsu University School of Medicine, Japan, where I also pursued my Post-doctoral training. Currently, I am a Senior Lecturer in the Department of Biological Sciences and the Director for Research & Development, Mount Kenya University. I am well published with 24 publications in international journals, in addition to supervising both PhD and Masters Students. In my career life, I have won several research grants and awards including the prestigious 2-year Japanese Society for the Promotion of Science (JSPS) postdoctoral fellowship, a 5-year Japanese Government PhD Scholarship, Bill and Melinda Gates Foundation Travel Awards (2008 and 2009). Previously I worked as a Lecturer at Kenyatta University at the Department of Biochemistry & Biotechnology. Previously I served for ten years as a Research Officer and later as a Senior Research Officer in the Malaria Unit of Kenya Medical Research Institute (KEMRI).

Research

My current research interests include antimalarial drug development, novel drug development strategies (hybrid drugs) and novel targets including apoptotic machinery. Other areas of interest include fitness cost of drug resistance as well as management of malaria in pregnancy. Natural products as sources for novel drugs as well as novel drug delivery systems including nanoparticles are also areas of my research interest. In the area of non-communicable diseases (NCDs), cancer is an area of high priority in my research agenda, since it is increasingly becoming a major killer in Kenya and sub-Saharan Africa.

Area of specialization

Research fields: Biomedical sciences with a bias on medicinal/pharmaceutical chemistry, pharmacology, protozoan diseases, biochemistry, drug development, drug resistance.

Publications

1. Musili R., **Muregi F.**, Mwatha J., Muriu D., M' Rewa L., Kamau T., Menaine A., Chege S., Thiong'o J., Ng'ang'a Z., Gachuhi K. (2015). Antischistosomal activity of *Azadirachta indica* and *Ekebergia capensis* in mice infected with *Schistosoma mansoni*. *European Journal of Medicinal Plants*, 6 (2). DOI: 10.9734/EJMP/2015/15196.
2. Gimode W.R., Kiboi D.M., Kimani F.T., Wamakima H.N., Burugu M.W., **Muregi F.W.**, (2015). Fitness Cost of Resistance for Lumefantrine and Piperaquine-Resistant Plasmodium Berghei in a Mouse Model. *Malaria journal*. Awaiting publication after successful peer review.

3. Mugweru J., Waihenya R., Kimani F., Ng'ang'a Z., Matiru V. and **Muregi F.W. (2013)**. Cytokine Levels Associated with Experimental Malaria Pathology during *Plasmodium berghei* ANKA infection in a mouse model. *Journal of Clinical Immunology and Immunopathology Research*, 5: 1-8.
4. **Muregi F.W.**, Nyakio H.W., Kimani F.T., **2012**. Novel Drug Targets in Malaria Parasite with Potential to yield Antimalarial Drugs with Long Useful Therapeutic Lives. *Current Pharmaceutical Design* 18 (24): 3505-21.
5. **Muregi F.W.**, Ohta I., Masato U, Kino H., Akira Ishih A., **2011**. Resistance of a Rodent Malaria Parasite to a Thymidylate Synthase Inhibitor Induces an Apoptotic Parasite Death and Imposes a Huge Cost of Fitness. *PLoS ONE*, 6 (6): e21251. doi:10.1371/journal.pone.0021251.
6. **Muregi F.W.**, Kirira P.G., Ishih A., **2011**. Novel rational drug design strategies with potential to revolutionize malaria chemotherapy. *Current Medicinal Chemistry*, 18: 113-143.
7. Muregi F.W., 2010. **Antimalarial drugs and their useful therapeutic lives: rational drug design lessons from pleiotropic action of quinolines and artemisinins**. *Current Drug Discovery Technologies*, 7: 280-316.
8. **Muregi F.W.**, Ishih A., **2010**. Next-generation antimalarial drugs: hybrid molecules as a new strategy in drug design. *Drug Development Research*, 71: 20-32.
9. **Muregi F.W.**, Kano S., Kino H., Ishih A., **2009**. *Plasmodium berghei*: Efficacy of 5-fluoroorotate in combination with commonly used antimalarial drugs in a mouse model. *Experimental Parasitology* 121: 376-380.
10. Rukunga G.M., Gathirwa J.W., Omar S.A., **Muregi F.W.**, Muthaura C.N., Kirira P.G., Mungai G.M., Kofi-Tsekpo W.M., **2009**. Anti-malarial activity of the extracts of some Kenyan medicinal plants. *Journal of Ethnopharmacology* 121: 282-285.
11. Ishih A., Nagata T., Kobayashi F., **Muregi F.W.**, Ohori K., Miyase T., **2008**. Possible involvement of IFN- γ in early mortality of *Plasmodium berghei* NK65-infected BALB/c mice after febrifugine treatment. *Southeast Asian Journal of Tropical Medicine and Public Health* 39: 949-958.
12. **Muregi F.W.**, Kino H., Ishih A., **2008**. *Plasmodium berghei*: Lack of antimalarial activity of an analogue of folate precursor, 2,4-diamino-6-hydroxymethylpteridine in a mouse model. *Experimental Parasitology* 120: 286-289.
13. Rukunga G.M., **Muregi, F.W.**, Tolo, F.M., Omar S.A., Gathirwa, J.W., Muthaura, C.N., Peter. M.G., Heydenreich, M., Mungai, G.M., **2008**. Anti-plasmodial activity of the extracts and two sesquiterpenes from *Cyperus articulatus*. *Fitoterapia* 79 (3): 188-190.

14. Murata T., Miyase T., **Muregi F.W.**, Naoshima-Ishibashi Y., Umehara K., Warashina T., Kano S., Mkoji G.M., Terada M., Ishih A., **2008**. Antiplasmodial Triterpenoids from *Ekebergia capensis*. *Journal of Natural Products* **71** (2): 167-174.
15. Rukunga, G.M., **Muregi, F.W.**, Tolo, F.M., Omar S.A., Mwitari, P., Muthaura, C.N., Omlin, F., Lwande, W., Hassanali, A., Githure, J., Iraqi, F.W., Mungai, G.M., Kraus, W., Kofi-Tsekpo, W.M., **2007**. The antiplasmodial activity of spermine alkaloids isolated from *Albizia gummifera*, *Fitoterapia* **78**: 455-459.
16. **Muregi F.W.**, Ishih A., Suzuki T., Kino H., Amano T., Mkoji G.M., Miyase T., Terada M., **2007**. Antimalarial activity of methanolic extracts from plants used in Kenyan ethnomedicine and their interactions with chloroquine (CQ) against a CQ-tolerant rodent parasite, in mice. *Journal of Ethnopharmacology* **111**: 190-195.
17. Ishih A., Miyase T., Suzuki T., **Muregi F.W.**, Terada M., **2007**. Seasonal variation in the content of a febrifugine and isofebrifugine alkaloid mixture in aerial parts of *Hydrangea macrophylla* var. *Otaksa*, with special reference to its antimalarial activity. *Journal of Natural Medicines* **61**: 213-216.
18. **Muregi F.W.**, Ishih A., Suzuki T., Kino H., Amano T., Mkoji G.M., Miyase T., Terada M., **2007**. *In Vivo* antimalarial activity of aqueous extracts from Kenyan medicinal plants and their chloroquine (CQ) potentiation effects against a blood-induced CQ-resistant rodent parasite in mice. *Phytotherapy Research* **21**: 337-343.
19. **Muregi F.W.**, Ishih A., Suzuki T., Kino H., Amano T., Mkoji G.M., Miyase T., Terada M. **2006**. *In Vivo* antimalarial activity of aqueous extracts from Kenyan medicinal plants and their interactions with chloroquine. *Journal of Traditional medicines* **23**: 141-146.
20. **Kirira P.G.**, Rukunga G.M., Wanyonyi A.W., **Muregi F.W.**, Gathirwa J.W., Muthaura C.N., Omar S.A., Tolo F., Mungai G.M., Ndiege I.O. **2006**. Antiplasmodial activity and toxicity of extracts of plants used in the traditional malaria therapy in Meru and Kilifi Districts of Kenya. *Journal of Ethnopharmacology* **106** (3): 403-407.
21. **Suzuki T.**, Ishih A., Hideto Kino, **Muregi F.W.**, Takabayashi S., Nishikawa T., Takagi H., Terada M. **2006**. Chromosomal mapping of host resistance loci to *Trichinella spiralis* nematode infection in rats. *Immunogenetics* **58** (1): 26-30.
22. **Ishih A.**, Suzuki T., **Muregi F.W.**, Matsui K., Terada M. **2006**. Chloroquine efficacy in *Plasmodium berghei* NK65-infected ICR mice, with reference to the influence of initial parasite load and starting day of drug administration on the outcome of treatment. *The Southeast Asian Journal of Tropical Medicine and Public Health* **37** (1): 13-17.
23. **Muregi F.W.**, Chhabra, S.C., Njagi, E.N.M., Lang`at-Thoruwa C.C., Njue, W.M., Orago, A.S.S., Omar, S.A., Ndiege, I.O. **2004**. Antiplasmodial activity of some Kenyan medicinal plants extracts singly and in combination with chloroquine. *Phytotherapy Research* **18**: 379-384.

24. **Muregi F.W.**, Chhabra, S.C., Njagi, E.N.M., Lang`at-Thoruwa C.C., Njue, W.M., Orago, A.S.S., Omar, S.A., Ndiege, I.O. **2003**. *In vitro* antiplasmodial activity of some plants used in Kisii, Kenya against malaria and their chloroquine potentiation effects. *Journal of Ethnopharmacology* **84**: 235-239.