

Publications

Open Access | **Synergist efficacy of piperonyl butoxide with deltamethrin as pyrethroid insecticide on *Culex tritaeniorhynchus* (Diptera: Culicidae) and other mosquito species**

M. R. Fakoorziba, F. Eghbal, V. A. Vijayan

Environmental Toxicology, Volume 24, Issue 1, Date: February 2009, Pages: 19-24

Continuous and indiscriminate use of pesticides, especially in tropical countries for public health or agriculture purpose, has led many vector populations to become resistant to organochlorides, organophosphates, and even to carbamates and pyrethroids.

Development of resistance by a vector population has been one of the reasons for the failure of the control measures in many countries. This investigation demonstrates the efficacy of piperonyl-butoxide (PBO) with deltamethrin, as pyrethroid insecticide, against the field-collected mosquito larvae of five species, *Aedes aegypti*, *Anopheles culicifacies*, *An. stephensi*, *An. vagus*, and *Culex quinquefasciatus*, and two morphological variants of *Cx. tritaeniorhynchus* (type A from grand pools of Mysore city and type B from rice fields of Mandya district).

Open Access | **Probability of emergence of antimalarial resistance in different stages of the parasite life cycle**

Wirichada Pongtavornpinyo, Ian M. Hastings, Arjen Dondorp, Lisa J. White, Richard J. Maude, Sompob Saralamba, Nicholas P. Day, Nicholas J. White, Maciej F. Boni

Evolutionary Applications, Volume 2, Issue 1, Date: February 2009, Pages: 52-61

Understanding the emergence and spread of antimalarial drug resistance in the context of different scenarios of antimalarial drug use is essential for the development of strategies protecting ACTs. In this study, we review the basic mechanisms of resistance emergence and describe several simple equations that can be used to estimate the probabilities of de novo resistance mutations at three stages of the parasite life cycle: sporozoite, hepatic merozoite and asexual blood stages; we discuss the factors that affect parasite survival in a single host in the context of different levels of antimalarial drug use, immunity and parasitaemia.

Open access | **Editorials and perspectives: Malarial anemia and STAT6**

Kathryn J.H. Robson, David J. Weatherall

Haematologica 2009;94 157-159

Understanding the mechanisms behind malarial anemia should lead to new approaches to the management and treatment of children. In this perspective article Drs. Robson and Weatherall examine the pathophysiology of this condition. See related article on page 195.

Open access | **STAT6-mediated suppression of erythropoiesis in an experimental model of malarial anemia**

Neeta Thawani, Mifong Tam, Mary M. Stevenson

Haematologica 2009;94 195-204

The findings of this study indicate a STAT6-dependent mechanism involving interleukin-4 in mediating erythropoietic suppression during blood-stage malaria. See related perspective article on page 157.

Open access | **Spatial analysis of malaria incidence at the village level in areas with unstable transmission in Ethiopia**



Yeshiwondim A, Gopal S, Hailemariam A, Dengela D, Patel H

International Journal of Health Geographics 2009, 8:5 (26 January 2009)

This study examines the spatial and temporal patterns of malaria transmission at the local level and implements a risk mapping tool to aid in monitoring and disease control activities. Malaria incidence varies according to gender and age, with males age 5 and above showing a statistically higher incidence. Significant local clustering of malaria incidence occurs between pairs of villages within 1-10 km distance lags. Malaria incidence was higher in 2002-2003 than in other periods of observation. Malaria hot spots are displayed as risk maps that are useful for monitoring and spatial targeting of prevention and control measures against the disease.

Open access | Research: Malaria and water resource development: the case of Gilgel-Gibe hydroelectric dam in Ethiopia

Yewhalaw D, Legesse W, Van Bortel W, Gebre-Selassie S, Kloos H, Duchateau L, Speybroeck N

Malaria Journal 2009, 8:21 (29 January 2009)

The issue of water resources development and management in the humid tropics warrants utmost attention, as this kind of natural resources development has a history of facilitating the spread and intensification of vector-borne diseases such as malaria.

Open access | Retinal Pathology of Pediatric Cerebral Malaria in Malawi

White VA, Lewallen S, Beare NAV, Molyneux ME, Taylor TE

PLoS ONE 4(1): e4317

The causes of coma and death in cerebral malaria remain unknown. Malarial retinopathy has been identified as an important clinical sign in the diagnosis and prognosis of cerebral malaria. As part of a larger autopsy study to determine causes of death in children with coma presenting to hospital in Blantyre, Malawi, who were fully evaluated clinically prior to death, we examined the histopathology of eyes of patients who died and underwent autopsy.

Open access | A calpain unique to alveolates is essential in Plasmodium falciparum and its knockdown reveals an involvement in pre-S-phase development

Iliaria Russo, Anna Oksman, Barbara Vaupel, and Daniel E. Goldberg

PNAS February 3, 2009 vol. 106 no. 5 1554-1559

Plasmodium falciparum encodes a single calpain that has a distinct domain composition restricted to alveolates. To evaluate the potential of this protein as a drug target, we assessed its essentiality.

Malarial Retinopathy in Cerebral Malaria

Nicholas A. V. Beare, Simon J. Glover, and Malcolm Molyneux

Am J Trop Med Hyg 2009;80 171

No abstract available

Methemoglobinemia and Adverse Events in Plasmodium vivax Malaria Patients Associated with High Doses of Primaquine Treatment

Jaime Carmona-Fonseca, Gonzalo Alvarez, and Amanda Maestre

Am J Trop Med Hyg 2009;80 188-193

Primaquine (PQ) is recommended to prevent relapses in patients with Plasmodium vivax malaria infection. However, treatment with PQ causes methemoglobinemia. In this study, we measured the methemoglobin (MetHB) levels in three groups of subjects who received PQ treatment at 0.58, 0.83, or 1.17 mg/kg/d. A total of 112 subjects were studied.



Severe Plasmodium vivax Malaria: A Report on Serial Cases from Bikaner in Northwestern India

Dhanpat K. Kochar, Ashish Das, Sanjay K. Kochar, Vishal Saxena, Parmendra Sirohi, Shilpi Garg, Abhishek Kochar, Mahesh P. Khatri, and Vikas Gupta

Am J Trop Med Hyg 2009;80 194-198

Epidemiologic studies and clinical description of severe Plasmodium vivax malaria in adults living in malaria-endemic areas are rare and more attention is needed to understand the dynamics and its interaction with the immune system. This observational study included 1,091 adult patients admitted to medical wards of S. P. Medical College and associated group of hospitals in Bikaner, India from September 2003 through December 2005.

Short report: Comparison of Chlorproguanil-Dapsone with a Combination of Sulfadoxine-Pyrimethamine and Chloroquine in Children with Malaria in Northcentral Nigeria

Oluwagbenga Ogunfowokan, Musa Dankyau, Aboi J. K. Madaki, and Tom D. Thacher

Am J Trop Med Hyg 2009;80 199-201

Effective and affordable treatment of malaria is critical in the face of resistance of Plasmodium falciparum to chloroquine (CQ) and sulfadoxine-pyrimethamine (SP). We conducted a randomized controlled trial comparing the efficacy of chlorproguanil-dapsone (CD) with a combination SP plus CQ in children in Nigeria less than five years of age with malaria.

Influence of Wasting and Stunting at the Onset of the Rainy Season on Subsequent Malaria Morbidity among Rural Preschool Children in Senegal

Florie Fillol et al.

Am J Trop Med Hyg 2009;80 202-208

In sub-Saharan Africa, malaria and malnutrition are major causes of morbidity and mortality in children less than five years of age. To explore the impact of malnutrition on subsequent susceptibility to malaria, a cohort of 874 rural preschool children in Senegal was followed-up during one malaria transmission season from July through December.

Assessment of Insecticide-Treated Bednet Use Among Children and Pregnant Women Across 15 Countries Using Standardized National Surveys

Thomas P. Eisele, Joseph Keating, Megan Littrell, David Larsen, and Kate Macintyre

Am J Trop Med Hyg 2009;80 209-214

Impact of insecticide-treated bednets (ITNs) on preventing malaria may be minimized if they are not used by vulnerable populations. Among ITN-owning households from 15 standardized national surveys from 2003 to 2006, we identify factors associated with ITN use among children younger than 5 years of age and make comparisons of ITN use among children and pregnant women across countries.

Chloroquine-resistant Plasmodium vivax in the Republic of Korea

Kkot Sil Lee, Tae Hyong Kim, Eu Suk Kim, Hyeong-Seok Lim, Joon-Sup Yeom, Gyo Jun, and Jae-Won Park

Am J Trop Med Hyg 2009;80 215-217

The number of Plasmodium vivax malaria patients in the Republic of Korea and North Korea since the re-emergence of malaria in 1993 is estimated to be approximately one million. In this study, treatment responses of P. vivax malaria patients in the Republic of Korea monitored during 2003–2007, and CQ resistance was confirmed in 2 of 484 enrolled patients. Our results are the first report of CQ-resistant P. vivax in a temperate region of Asia. Continuous surveillance is warranted to monitor the change in CQ resistance frequency of P. vivax in the Republic of Korea.



Genetic Variation among Plasmodium vivax Isolates Adapted to Non-Human Primates and the Implication for Vaccine Development

Francis B. Ntumngia, Amy M. McHenry, John W. Barnwell, Jennifer Cole-Tobian, Christopher L. King, and John H. Adams

Am J Trop Med Hyg 2009;80 218-227

Plasmodium vivax Duffy binding protein (DBP) is vital for parasite development, thereby making this molecule a good vaccine candidate. Preclinical development of a *P. vivax* vaccine often involves use of primate models prior to testing efficacy in humans, but primate isolates are poorly characterized. We analyzed the complete gene coding for the DBP in several *P. vivax* isolates that are used for experimental primate infections and compared these sequences with the Salvador I DBP isolate, which is being used for vaccine development.

Studies on the Salvador I Strain of Plasmodium vivax in Non-human Primates and Anopheline Mosquitoes

William E. Collins, Joann S. Sullivan, Elizabeth Strobert, G. Gale Galland, Allison Williams, Douglas Nace, Tyrone Williams, and John W. Barnwell

Am J Trop Med Hyg 2009;80 228-235

A review is presented on studies conducted in New World monkeys and chimpanzees with the Salvador I strain of *Plasmodium vivax*. This isolate has been adapted to Aotus and Saimiri (squirrel) monkeys and developed as a model for the testing of antimalarial vaccines.

Short report: A Multiplex PCR Assay for Simultaneous Genotyping of kdr and ace-1 Loci in Anopheles gambiae

Athina Kazanidou, Dimitra Nikou, Maria Grigoriou, John Vontas, and George Skavdis

Am J Trop Med Hyg 2009;80 236-238

The selection of insecticide-resistant genotypes in *Anopheles gambiae*, the most important malaria vector in Africa, makes disease control problematic in several endemic areas. The early detection and monitoring of resistance associated mutations in field mosquito populations is essential for the application of successful insecticide-based control interventions. Currently, the surveillance of these mutations is performed using individual assays, some of which require sophisticated and expensive equipment. Here we describe a novel multiplex polymerase chain reaction-based assay for detecting simultaneously the five single nucleotide polymorphisms in the voltage-gated sodium channel and the ace-1 genes, which have been associated with the mosquito response to most commonly used insecticides.

Hemin-induced suicidal erythrocyte death

Sergios Gatidis, Michael Föller and Florian Lang

Annals of Hematology, Online First

Several diseases, such as malaria, sickle cell disease, and ischemia/reperfusion may cause excessive formation of hemin, which may in turn trigger hemolysis. A variety of drugs and diseases leading to hemolysis triggers suicidal erythrocyte death or eryptosis, i.e., cell membrane scrambling and cell shrinkage. Eryptosis is elicited by increased cytosolic Ca²⁺ activity and by ceramide. The present study explored whether hemin stimulates eryptosis.

The interplay between the geographic distribution of HLA-B27 alleles and their role in infectious and autoimmune disease: A unifying hypothesis

Alessandro Mathieu, Fabiana Paladini, Alessandra Vacca, Alberto Cauli, Maria Teresa Fiorillo, Rosa Sorrentino

Autoimmunity Reviews, Article in Press, Uncorrected Proof



The existence of conserved HLA haplotypes have since long been thought to result from a selective pressure by some pathogens that have edited the immune response genes. The peculiar distribution of the ancestor HLA-B2705 along a latitude-dependent gradient and the opposite distribution of their variants have suggested a correlation with endemic malaria. In this respect, Sardinia, a small Mediterranean island plagued by malaria, represents an interesting laboratory since its population is enriched in conserved HLA haplotypes and several genetic studies have disclosed their correlation with infectious and autoimmune diseases.

Synthesis and biological evaluation of extraordinarily potent C-10 carba artemisinin dimers against *P. falciparum* malaria parasites and HL-60 cancer cells

James Chadwick, Amy E. Mercer, B. Kevin Park, Richard Cosstick, Paul M. O'Neill
Bioorganic & Medicinal Chemistry, Volume 17, Issue 3, 1 February 2009, Pages 1325-1338

A series of artemisinin dimers incorporating a metabolically stable C-10 carba-linkage have been prepared, several of which show remarkable in vitro antimalarial activity (as low as 30 pM) versus *Plasmodium falciparum* and in vitro anticancer activity in the micromolar to nanomolar range versus HL-60 cell lines.

Disruption of *Plasmodium* sporozoite transmission by depletion of the Sporozoite Invasion-Associated Protein-1

Engelmann S, Silvie O, Matuschewski K.
Eukaryotic Cell. , E-pub ahead of print

Here, we characterized the cellular role of the *Plasmodium berghei* sporozoite invasion-associated protein-1 (SIAP-1).

We propose that arthropod-transmitted apicomplexan parasites specifically express secretory factors, such as SIAP-1, that mediate efficient oocyst exit and migration to the salivary glands.

The shiitake mushroom-derived immuno-stimulant lentinan protects against murine malaria blood-stage infection by evoking adaptive immune-responses

Lian-di Zhou, Qi-hui Zhang, Ying Zhang, Jun Liu, Ya-ming Cao

International Immunopharmacology, In Press, Uncorrected Proof, Available online 2 February 2009

Lentinan, a (1-3)-beta glucan from *Lentinus edodes*, is an effective immunostimulatory drug. We tested the effects of lentinan during blood-stage infection by *Plasmodium yoelii* 17XL (P.y17XL). In summary, lentinan can induce protective Th1 immune responses to control the proliferation of malaria parasites during the blood-stage of P.y17XL infection by stimulating maturation of DCs to inhibit negative regulation of the Th1 immune response by Tregs. Taken together, our findings suggest that lentinan has prophylactic potential for the treatment of malaria.

Genetic analysis of the cytoplasmic domain of the PfRh2b merozoite invasion protein of *Plasmodium falciparum*

Tiffany M. DeSimone, Amy K. Bei, Cameron V. Jennings, Manoj T. Duraisingh

International Journal for Parasitology, Volume 39, Issue 4, March 2009, Pages 399-405

Here we focus on the cytoplasmic tail domain of the rhoptry-localised *Plasmodium falciparum* RBL PfRh2b. We have identified a conserved sequence of six amino acids, enriched in acidic residues, in the cytoplasmic tail domains of RBL proteins from *Plasmodium* spp.

TREP, a novel protein necessary for gliding motility of the malaria sporozoite

Audrey Combe, Cristina Moreira, Susan Ackerman, Sabine Thiberge, Thomas J. Templeton, Robert Ménard

International Journal for Parasitology, Volume 39, Issue 4, March 2009, Pages 489-496
Gliding motility of the Plasmodium sporozoite, the stage of the malaria parasite that is transmitted by the mosquito to the mammalian host, depends on the TRAP protein. We describe a second protein, herein termed TREP, which also plays a role in the gliding motility of the Plasmodium sporozoite.

Application of a liquid chromatography/tandem mass spectrometry method for the pharmacokinetic study of dihydroartemisinin injectable powder in healthy Chinese subjects

Yiming Liu, Xing Zeng, Yuanhui Deng, Lu Wang, Yi Feng, Liu Yang, Dan Zhou
Journal of Chromatography B, Volume 877, Issues 5-6, 15 February 2009, Pages 465-470

A simple, rapid and accurate liquid chromatography–electrospray ionization–tandem mass spectrometry method was developed and validated for quantification of dihydroartemisinin (DHA) in human plasma.

Short communication: Validation of high performance liquid chromatography–electrochemical detection methods with simultaneous extraction procedure for the determination of artesunate, dihydroartemisinin, amodiaquine and desethylamodiaquine in human plasma for application in clinical pharmacological studies of artesunate–amodiaquine drug combination

Choon-Sheen Lai, N.K. Nair, A. Muniandy, S.M. Mansor, P.L. Olliaro, V. Navaratnam
Journal of Chromatography B, Volume 877, Issues 5-6, 15 February 2009, Pages 558-562

With the expanded use of the combination of artesunate (AS) and amodiaquine (AQ) for the treatment of falciparum malaria and the abundance of products on the market, comes the need for rapid and reliable bioanalytical methods for the determination of the parent compounds and their metabolites. While the existing methods were developed for the determination of either AS or AQ in biological fluids, the current validated method allows simultaneous extraction and determination of AS and AQ in human plasma.

Analysis of quaternary structure of a [LDH-like] malate dehydrogenase of Plasmodium falciparum with oligomeric mutants

Anupam Pradhan, Prasenjit Mukherjee, Abhai K. Tripathi, Mitchell A. Avery, Larry A. Walker and Babu L. Tekwani

Molecular and Cellular Biochemistry, Online First

I-Malate dehydrogenase (PfMDH) from Plasmodium falciparum, the causative agent for the most severe form of malaria, has shown remarkable similarities to I-lactate dehydrogenase (PflDH). PfMDH is more closely related to [LDH-like] MDHs characterized in archae and other prokaryotes. Initial sequence analysis and identification of critical amino acid residues involved in inter-subunit salt-bridge interactions predict tetrameric structure for PfMDH.

Intranasal administration of the synthetic polypeptide from the C-terminus of the circumsporozoite protein of Plasmodium berghei with the modified heat-labile toxin of Escherichia coli (LTK63) induces a complete protection against malaria challenge

Jackeline F. Romero, Annalisa Ciabattini, Philippe Guillaume, Geraldine Frank, Paolo Ruggiero, Elena Pettini, Giuseppe Del Giudice, Donata Medaglini, Giampietro Corradin
Vaccine, Volume 27, Issue 8, 18 February 2009, Pages 1266-1271

Needle-free procedures are very attractive ways to deliver vaccines because they diminish the risk of contamination and may reduce local reactions, pain or pain fear



especially in young children with a consequence of increasing the vaccination coverage for the whole population. For this purpose, the possible development of a mucosal malaria vaccine was investigated.

Events

MIM Pan-African Malaria Conference: Call For Symposia, Workshops, Parallel Meetings And Exhibitions

Deadline for submission: 31 March 2009

The Fifth MIM Pan-African Malaria Conference Scientific Committee invites requests for Symposia, Training Workshops Parallel Meetings and Exhibitions as follows.

Submission at events@mimalaria.org

Contact: Conference Coordinator, Email: pamc@amanet-trust.org

Education

Workshop: Mosquitoes and all that jazz

Date: 28 June 2009 – 9 July 2009-02-03

Location: Copenhagen, Denmark

A two week workshop for a very limited number of students will be run from 28th of June - 9th July 2009 in wonderful Copenhagen. Students will learn basic collection (light trapping, tent traps, landing and resting collection) identification and dissection techniques (simple and advanced age grading). They will stay (in their own tent trap!) by one of the lakes on the outskirts of the City and work in the mornings at DBL Centre for Health Research and Development at the University.

Students will pay for their costs (travel, food and drinks). For this, the first course of its kind in Europe, there will be no bench or other fees. The course will be suitable for students planning to undertake ecological work with disease vectors in the tropics. There are a limited number of places (maximum 8) so apply early!

(It is merely coincidental that the workshop will take place during the Copenhagen Jazz Festival – information on the many free open air concerts is available on the world wide web). Further information can be obtained from Dr J D Charlwood

jdcharlwood@gmail.com or Dr EM Pedersen emp@life.ku.dk

News

General

3 February 2009, Irish Times

Resistant strain may render anti-malaria drug useless

A front-line anti-malaria drug currently used around the world could become useless unless an emerging pocket of drug resistance in Southeast Asia is contained, an expert has warned. Artemisinin therapy is widely used to treat malaria, which is caused by a blood-borne parasite.

31 January 2009, The Straits Times

Malaria help by 2010

Hundreds of millions of mosquito nets and anti-malaria kits are to be distributed by 2010, officials behind a campaign to halt about one million malaria deaths a year said on Saturday.



Africa

5 February 2009, Independent

Nigeria: Malaria Responsible for 60 Percent of Hospital Cases in Cross River

As the fight against the scourge of malaria fever continues, about 60 per cent of ailments recorded in hospitals in Cross River State have been linked to the disease.

4 February 2009, SW Radio

Zimbabwe: Cholera Statistics Rise Again As New Malaria Fears Grow

The number of cholera cases reported in the country has once again jumped by more than 1000 cases, and according to the World Health Organisation the official figures now stand at more than 65 000 infections since August last year.

30 January 2009, The Post

Cameroon: Experts to Brainstorm On Universal Malaria Treatment

Some 40 experts engaged in the fight against malaria would January 28-29 at the John XXIII Centre Mvolye, Yaounde, hold a deliberative forum on equitable and universal access to Artemisinin Combination Therapy, ACTs, for the treatment of non-complicated malaria in the country.

Asia

4 February 2009, The Times of India

India: Mass Drug Administration To Prevent Malaria On Feb 25

Varanasi: Under the filaria elimination programme, the district will witness the mass drug administration (MDA) of single a dose of drug on February 25.

3 February 2009, Medical News Today

Singapore: Novel Method Of Immunization That Completely Eliminates Malaria Parasites

Singapore scientists report that they have discovered a novel method of immunization that completely eliminates the malaria parasites in both stages of the parasite's development.

30 January 2009, PIA

Philippines: DOH cites mining firm for supporting anti-malaria campaign

The regional office of the Department of Health cited a mining firm for active supporting the anti-malaria campaign in rural areas of Mati City in Davao oriental province.

Oceania

3 February 2009, The Age

Australia: Australian scientists find way to 'starve' malaria parasite

Australian scientists have found a way to "starve" the parasite responsible for malaria, raising hopes of a breakthrough treatment for the illness which claims a million lives every year.

29 January 2009, Solomon Star

Solomon islands: Malaria plans discussed

Officials from the Ministry of Health and the Japanese International Cooperation Agency (JICA) gathered yesterday in Honiara. This was for the annual joint coordinating committee to discuss further activities to strengthen Malaria control here this year.



Americas

5 February 2009, Fox News

USA: Bill Gates Unleashes Swarm of Mosquitoes on Crowd

Microsoft founder turned philanthropist Bill Gates released a glass full of mosquitoes at an elite technology conference to make a point about the deadly disease malaria.

2 February 2009, PR Newswire

USA: Recent U.S. Ambassador to Tanzania Mark Green Named Managing Director of Malaria No More Policy Center

Mark Green, recent U.S. Ambassador to the United Republic of Tanzania, joins Malaria No More as the new Managing Director of the Malaria No More Policy Center in Washington, DC, the non-profit organization announced today.

2 February 2009, The Christian Science Monitor

USA: Funds tighten for fighting AIDS and malaria worldwide

Global health leaders are urging the Obama administration to make up a deepening shortfall. The international financial crisis could set back recent progress in international efforts to combat malaria, AIDS, and tuberculosis, global health leaders are warning.

2 February 2009, The Daily News Tribune

USA: What's up doc? Malaria a worldwide problem

Q: What can you tell me about malaria? Do people in the U.S. get it?

29 January 2009, The Johns Hopkins Newsletter

USA: Major step in malaria infection is unveiled in breakthrough

Researchers at the Bloomberg School of Public Health have announced a major advance in the fight against malaria: They have discovered the proteins that make it possible for the parasite Plasmodium berghei to infect mosquitoes.

28 January 2009, The Earth Times

USA: InnoCentive Solver Offers Ingenious Low-Cost Solution in Fight Against Malaria

InnoCentive, Inc., the global innovation marketplace, and SunNight Solar, a company dedicated to delivering products that solve problems plaguing the developing world, today announced the conclusion of a Challenge posted last spring that sought the design of an affordable solar-powered device to prevent or limit the spread of malaria.

Europe

5 February 2009, BBC

UK: Insecticide malaria impact clue

UK scientists have identified genetic differences in malarial mosquitoes which may reveal their level of resistance to insecticides.

3 February 2009, VOA News

Switzerland: Advocates Press to Sustain Global Health Fund Commitments for Fighting AIDS, TB, and Malaria

Amid the sober economic discussions at the just-concluded World Economic Forum summit of business, economic, and health leaders in Davos, Switzerland, a current \$5-billion shortfall in financing the worldwide campaign against AIDS, tuberculosis and malaria poses a daunting challenge to donors and to recipients in developing countries.

1 February 2009, The Independent



UK: Malaria kills BA steward and leaves two seriously ill

The death of a cabin crew member raises concerns that a change in drugs provision has put staff at risk

31 January 2009, AP

Switzerland: Business leaders raising \$100M against malaria

Business leaders attending the World Economic Forum have begun a \$100 million fund-raising campaign to fight malaria in Africa.

MalariaWorld - Knowledge for Solutions

K&S Consulting is an independent consultancy firm concerned with medical information provision, training activities, and infectious diseases consultations.

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