Melbourne Malaria 2011

Program & Abstracts

Royal Melbourne Hospital
Convention Centre

3 & 4 October 2011

Generously sponsored by Beckman Coulter

Program at a Glance

DAY 1

08:00 - 09:15	Registration
09:15 - 09:30	Welcome and Housekeeping
09:30 - 10:30	**Plenary Session**
10:30 - 11:00	Morning Tea
11:00 - 12:30	**Session 1: Invasion & Motility**
12:30 - 14:00	Lunch & **Poster Session** (odd numbers)
14:00 - 15:30	**Session 2: Host Cell Remodeling & Protein Trafficking**
15:30 - 16:00	Afternoon Tea
16:00 - 17:30	**Session 3: Gene Regulation & Metabolic Pathways**
18:00	Conference Dinner

DAY 2

09:00 - 10:30	**Session 4: Host Response**
10:30 - 11:00	Morning Tea
11:00 - 12:30	**Session 5: Protein Structure & Function**
12:30 - 14:00	Lunch & **Poster Session** (even numbers)
14:00 - 15:30	**Session 6: Genetic Diversity**
15:30 - 16:00	Afternoon Tea
16:00 - 17:30	**Session 7: Antimalarial Discovery & Delivery**
17:30	Awards Ceremony
18:00	Come Together at the Castle

Dear Malaria in Melbourne 2011 delegate,

We warmly welcome you to this latest installment in the *Malaria in Melbourne* Conference series, to be held over the next two days at the Royal Melbourne Hospital Convention Centre in Parkville.

Melbourne is undoubtedly a major international hub for malaria research, with more than forty labs in and around the city that focus on different aspects of this devastating disease. Malaria in Melbourne is a unique forum that brings together our research community to present their latest data and facilitate the development of collaborative links between institutes, strengthening our common goal to develop new ways to control malaria. The conference is firmly focused on early career researchers, giving them an opportunity to showcase their recent achievements and build their resumes at this critical time in their career. This year, we are also delighted to welcome members of the broader Australian malaria research community, including our plenary speaker, Professor Kiaran Kirk, who has made major contributions to the malaria field during his career, both as a researcher and as a mentor.

The MiM 2011 program reflects the breadth of disciplines covered by our community, ranging from basic science through to clinical/epidemiological studies and translational research. In addition to a diverse array of sessions, talks and posters, the program also provides ample time for networking and socializing, with a long poster session on both days and social events in the evening. We hope that you can capitalize on these opportunities and enjoy yourselves along the way!

Yours sincerely,

Phillippe Boeuf and Alyssa Barry

Co-chairs

Program

MONDAY 03/10/2011

08:00 - 09:15 Registration

09:15 - 09:30 Welcome & Housekeeping

09:30 - 10:30 **Plenary Session**
Sponsor: Monash University and Continental Pacific Travel Services
Chair: Philippe Boeuf & Alyssa Barry

PL **Of malaria and membrane transport**
Kiaran Kirk - Research School of Biology, The Australian National University

10:30 - 11:00 Morning Tea

11:00 - 12:30 **Session 1: Invasion & Motility**
Sponsor: International Journal for Parasitology
Chairs: Eric Hanssen & Matthew Dixon

T1 **Minimal requirements for actin filament disassembly revealed by structural analysis of malaria parasite actin-depolymerising factor 1**
Wilson Wong - Infection and Immunity Division, WEHI

T2 **Calcium-dependent phosphorylation of the invasion motor of *Toxoplasma gondii***
James McCoy - Infection and Immunity Division, WEHI

T3 **Importance of mitochondrial ATP synthase in the malaria life cycle**
Angelika Sturm - Plant Cell Biology Research Centre, School of Botany, The University of Melbourne

T4 **The apical ring protein RNG2 is critical for host cell invasion in *Toxoplasma gondii***
Nicholas Katris - Plant Cell Biology Research Centre, School of Botany, The University of Melbourne

T5 **Gametocyte development in *P. falciparum*; understanding how and why?**
Megan Dearnley - Bio21 Molecular Science and Biotechnology Institute, The University of Melbourne

12:30 - 14:00 Lunch & **Poster Session (odd numbers)**

14:00 - 15:30 **Session 2: Host Cell Remodeling & Protein Trafficking**
Sponsor: ARC Centre of Excellence for Coherent X-ray Science
Chairs: Melanie Rug & Silvia Haase

T6 ***Babesia* and *Plasmodium*, not so similar after all?**
Sejal Gohil - Department of Microbiology, Monash University

T7 **The *Plasmodium* food vacuole: protein targeting of transmembrane proteins**
Florian Ehlgen - Department of Biochemistry and Molecular Biology, Bio21 Molecular Science and Biotechnology Institute, The University of Melbourne

T8 **The exomembrane system of *Plasmodium falciparum* and its role in PfEMP1 trafficking**
Paul McMillan - ARC Centre of Excellence for Coherent X-ray Science and the Department of Biochemistry & Molecular Biology, The University of Melbourne

T9 **Who needs a PEXEL to get out?**
Teresa Carvalho - Infection and Immunity Division, WEHI

T10 **Functional Genomics of an ATP-Binding Cassette (ABC) Transporter in *Plasmodium falciparum* Gametocytes**
Phuong Tran

15:30 - 16:00 Afternoon Tea

16:00 - 17:30 **Session 3: Gene Regulation & Metabolic Pathways**
Sponsor: Molecular and Biochemical Parasitology
Chairs: Giel van Dooren & Michaela Petter

T11 **Characterisation of a novel bromodomain protein of the malaria parasite *Plasmodium falciparum***
Gabrielle Josling - Dept. of Medicine (RMH), The University of Melbourne

T12 **The identification and characterisation of alternatively-spliced genes and their regulation in *Plasmodium falciparum* and *Toxoplasma gondii***
Lee Yeoh - Dept. of Biochemistry and Molecular Biology & School of Botany, The University of Melbourne

T13 **Acetyl-CoA Carboxylase activity is essential for sporozoite development in *Plasmodium berghei***
Chris Goodman - School of Botany, The University of Melbourne

T14 **Investigating phosphatidic acid synthesis in the *Plasmodium falciparum* apicoplast**
Melanie Shears - School of Botany, The University of Melbourne

T15 **Targeting Na^+ regulation in the intraerythrocytic malaria parasite**
Natalie Spillman - Research School of Biology, The Australian National University

18:00 Conference Dinner at Tsubu Bar

TUESDAY 04/10/2011

09:00 - 10:30 **Session 4: Host Response**
Sponsor: Miltenyi Biotec
Chairs: Brendan McMorran & Diana Hansen

T16 **Understanding naturally acquired immunity to *Plasmodium Falciparum* malaria: a critical role for anti-merozoite antibody concentrations in predicting protection from clinical episodes**
Faith Osier - KEMRI Centre for Geographic Research, Coast, Kilifi, Kenya & Centre for Immunology, Burnet Institute

T17 **Evasion of immunity to *Plasmodium falciparum* malaria by IgM masking of protective IgG epitopes in PfEMP1**
Lea Barford - Centre for Medical Parasitology at Department of International Health, Immunology and Microbiology, University of Copenhagen and at Department of Infectious Diseases, Copenhagen University Hospital

T18 **Submicroscopic parasitaemia and bone marrow IFN-γ are linked to erythropoietic suppression in malarial anaemia**
Ariel Achtman - Infection and Immunity Division, WEHI

T19 **Distinct inflammatory outcomes from different *Plasmodium*-infected erythrocytes uptake pathways in macrophages**
Caroline Chua - Dept. of Medicine (RMH), The University of Melbourne

T20 **Malaria infected erythrocytes stimulate monocyte-derived macrophage inflammatory cytokine production which is impaired by HIV-1 infection**
Louise Ludlow - Dept. of Medicine (RMH/WH), The University of Melbourne & Centre for Virology, Burnet Institute

10:30 - 11:00 Morning Tea

11:00 - 12:30 **Session 5: Protein Structure & Function**
Sponsor: Monash University
Chairs: Paul Gilson & Catherine Nie

T21 **Computational and cellular identification of conserved proteins involved in apicomplexan host-cell invasion**
Elizabeth Zuccala - WEHI & Dept. of Medical Biology, The University of Melbourne

T22 **Functional analysis of 6-cys domain merozoite surface antigens in *Plasmodium falciparum***
Tana Taechalertpaisarn - Centre for Population Health, Burnet Institute

T23 **An integrative bioinformatic predictor of protein sub-cellular localisation in *P. falciparum***
Ben Woodcroft - Dept. of Biochemistry and Molecular Biology & Bio21 Molecular Science and Biotechnology Institute, The University of Melbourne

T24 **Structural and functional analysis of MSP-DBL1 and 2, two peripherally associating merozoite proteins of the malarial parasite, *Plasmodium falciparum* involved in invasion**
Clara Lin - Infection and Immunity Division, WEHI

T25 **Differentional shedding of merozoite surface proteins during *P. falciparum* invasion of human erythrocytes**
Michelle Boyle - Centre of Immunology, Burnet Institute

12:30 - 14:00 Lunch & **Poster Session (even numbers)**

14:00 - 15:30 **Session 6: Genetic Diversity**
Sponsor: Burnet Institute
Chairs: Nigel Beebe & Alyssa Barry

T26 **Quantifying invasion inhibitory antibodies to AMA1 in human populations using transgenic *Plasmodium falciparum*: Implications for vaccine design**
Damien Drew - Burnet Institute

T27 **The epidemiology of two newly described human malaria species in Papua New Guinea**
Benita Knox - Infection and Immunity Division, WEHI

T28 **Molecular epidemiology of *Plasmodium vivax* in Papua New Guinea**
Alicia Arnott - Centre for Population Health, Burnet Institute

T29 **Towards a multi-allele *P. falciparum* AMA1 vaccine: cross-reactivity of naturally acquired antibodies gives insights into antigenic diversity and relatedness between alleles.**
Ulrich Terheggen – Burnet Institute

T30 **Population genomics of the immune evasion (*var*) genes of *Plasmodium falciparum* in PNG**
Mark Schultz - Infection and Immunity Division, WEHI

15:30 - 16:00 Afternoon Tea

16:00 - 17:30 **Session 7: Antimalarial Discovery & Delivery**
Sponsor: Malaria Nexus
Chairs: Freya Fowkes & Damien Drew

T31 **A new way to find anti-malarial drugs using a large-scale ENU mutagenesis screen in mice**
Gaetan Burgio - Dept. of Genetics, Menzies Research Institute, University of Tasmania

T32 **Screening compounds with anti-malarial properties for inhibition of *P. falciparum* merozoite invasion**
Danny Wilson - Infection and Immunity Division, WEHI

T33 **Validation of a within-host model of the dynamics of *P. falciparum* parasites in the presence of antimalarial drug treatment**
Sophie Zaloumis - Centre for Molecular, Environmental, Genetic & Analytic Epidemiology, The University of Melbourne

T34 **Optimal designs for population pharmacokinetic studies of the partner drugs administered with artemsinin derivatives**
Kris Jamsen - Centre for Molecular, Environmental, Genetic & Analytic Epidemiology, The University of Melbourne

T35 **Soft x-ray microscopy analysis of cell volume and hemoglobin content in erythrocytes infected with asexual and sexual *P. falciparum***
Eric Hanssen - Electron Microscopy Unit, Bio21 Molecular Science and Biotechnology Institute, The University of Melbourne

17:30 Awards Ceremony
Sponsors: International Journal for Parasitology, Life Technologies, WEHI, La Trobe Institute for Molecular Science, Trends in Parasitology, Molecular Approaches to Malaria 2012

18:00 Come Together at the Castle

Plenary Lecture

Of malaria and membrane transport

Kiaran Kirk

Research School of Biology, The Australian National University, Canberra, ACT, Australia

The malaria parasite-infected erythrocyte is a complex system comprised of multiple membrane-bound compartments. The flux of solutes (nutrients, intermediary metabolites, metabolic wastes and inorganic ions, as well as some antimalarial drugs) into and out of these compartments is mediated by membrane transport proteins. The malaria parasite genome encodes well over a hundred such proteins. Some show significant promise as antimalarial drug targets, and some play a key role in drug delivery and/or antimalarial drug resistance. As it grows within its host erythrocyte the parasite induces in the erythrocyte membrane 'New Permeability Pathways' that mediate the influx and efflux of a wide range of low molecular weight solutes. The transport of inorganic ions via these pathways results in a profound change in the ionic composition of the erythrocyte cytosol. At the same time, the parasite maintains tight control of its own internal ion concentrations, doing so via a combination of membrane transport proteins - pumps, channels and transporters - which work together to generate and maintain transmembrane electrochemical ion gradients. These gradients provide the driving force for the uptake of key nutrients, as well as for the accumulation of some classes of antimalarial drugs. Recent studies have revealed that at least one of the mechanisms involved in ion regulation in the parasite – an ion transporting ATPase – holds considerable promise as an antimalarial drug target. Work in this area will be discussed.

The Malaria in Melbourne Organizing Committee
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