

PLASMODIUM VIVAX

THE LAST PARASITE STANDING



SCIENTIFIC SYMPOSIUM

PROGRAM & BIOGRAPHIES

Tuesday, April 2, 2013

1:30-7:00 PM

Auditorium I Broad Institute
Cambridge, MA



HARVARD
SCHOOL OF PUBLIC HEALTH
Powerful ideas for a healthier world



**Massachusetts
Institute of
Technology**

AGENDA

1:30PM

WELCOME & OPENING REMARKS

Eric Lander, Founding Director & President, Broad Institute,
Professor of Systems Biology, Harvard Medical School

1:40PM

THE "BIG PICTURE" CHALLENGE OF P.VIVAX

Alan Magill, Director, Malaria, Global Health Program,
Bill & Melinda Gates Foundation

2:00PM

RESEARCH PRESENTATION I

Moderated by Sangeeta Bhatia, John J. and Dorothy Wilson
Professor of Health Sciences and Technology & electrical
Engineering and Computer Science, MIT

Manoj Duraisingh, Associate Professor of Immunology &
Infectious Diseases, HSPH

John Adams, Professor, College of Public Health, University
of Southern Florida

Daniel Neafsey, Group Leader, Malaria Genome Sequencing
& Analysis, Broad Institute

3:00PM

COFFEE BREAK

3:15PM

RESEARCH PRESENTATION II

Moderated by Manoj Duraisingh, Associate Professor of
Immunology & Infectious Diseases, HSPH

Sangeeta Bhatia, John J. and Dorothy Wilson Professor of
Health Sciences and Technology & electrical Engineering and
Computer Science, MIT

Erica Pasini, Scientist, Department of Parasitology, Biomedical
Primate Research Centre

Elizabeth Winzeler, Professor of Pharmacology & Drug
Discovery, University of California San Diego

4:15PM

PANEL DISCUSSION - CHALLENGES TO P.VIVAX MALARIA ERADICATION

Moderated by Dyann Wirth, Professor and Chair, Department
of Immunology and Infectious Diseases, HSPH

John Barnwell, Chief, Laboratory Research & Development Unit, Malaria Branch, Division of Parasitic Diseases and Malaria, Centers for Disease Control and Prevention

David Kaslow, Director, PATH, Malaria Vaccine Initiative

Didler Leroy, Director, Drug Discovery, Research and Development, MMV

Alan Magill, Director, Malaria, Global Health Program, Bill & Melinda Gates Foundation

Mark Parrington, Senior Director, Head of Technology Projects Group, Sanofi Pasteur

5:15PM

CLOSING REMARKS

Dyann Wirth, Professor and Chair, Department of Immunology and Infectious Diseases, HSPH

5:30PM

NETWORKING RECEPTION

Lobby

SPEAKER BIOGRAPHIES



JOHN ADAMS

Professor, Department of Global Health, College of Public Health, University of Southern Florida

Since June 2007 John H. Adams has been Professor at the University of South Florida College of Public Health Global Health Infectious Diseases Research program. Previously he spent 16 years in the Department of Biological Sciences University of Notre Dame. He was trained in basic parasitology (B.A. 1978, Hendrix College, Ph.D. 1985, University of Illinois College of Veterinary Medicine, 1986-87, Postdoctoral Fellow, Department of Parasitology, University of Queensland) and during 1987-1991 began a career in molecular approaches to malaria in the Laboratory of Parasitic Diseases at the National Institutes of Health. His research program studies the biology of malaria parasites with the expectation that a better understanding of *Plasmodium* biology will enable the development of better ways to control malaria through vaccines, drugs and other prevention strategies. Major projects of his research group include: 1) promotion of *Plasmodium vivax* Duffy binding protein (DBP) vaccine development; 2) development of *in vitro* model systems for *P. vivax* and *P. falciparum* research; and 3) advancement of functional genomics of *P. falciparum* through large-scale, whole genome transposon mutagenesis screens.



JOHN BARNWELL

Senior Biomedical Research Service Scientist
Chief, Laboratory Research & Development Unit,
Malaria Branch, Division of Parasitic Diseases and
Malaria, Centers for Disease Control and Prevention

John Barnwell has over 38 years of experience studying the biology of malaria parasites, their vectors and epidemiology, and the disease states they cause in primates and humans. This knowledge has been gained over years of research experience in a variety of settings, including the laboratory, the field, and as a consultant. He has published over 160 peer-reviewed papers and book chapters on various subjects concerning malaria and other parasitic diseases. He is Chief of the laboratory unit for the Malaria Branch of the Centers for Disease Control and Prevention (CDC). In this role, he is responsible for supervising several laboratories and many investigations that encompass epidemiology; vaccine and drug development; parasite biology; non-human primate models of malaria; mosquito vector-parasite interactions; drug resistance mechanisms and markers; and parasite genetics and immunity.

Prior to joining the CDC, Dr. Barnwell was a professor for 15 years at New York University School of Medicine where he developed one of the few research programs in the world devoted to the study of *P. vivax* cell and molecular biology and made several seminal discoveries on virulence factors for *P. falciparum* and *P. vivax*. He made extensive use of experimental non-human primate model systems for simian and human malaria parasites to focus on the mosquito, liver-stage and blood-stage parasites in regards to the cellular and molecular biological processes and pathophysiological aspects of malaria disease. His ongoing research interests include studying the biology of liver-stage hypnozoites of *P. vivax* and *P. cynomolgi*.



SANGEETA BHATIA

John J. and Dorothy Wilson Professor of Health Sciences and Technology & Electrical Engineering and Computer Science, MIT

Dr. Bhatia is a Howard Hughes Medical Institute Investigator and the John J. and Dorothy Wilson Professor of Health Sciences and Technology (HST), Electrical Engineering and Computer Science (EECS) and Institute for Medical Engineering and Science (IMES) at the Massachusetts Institute of Technology. She is a member of the Koch Institute for Integrative Cancer Research and the Harvard Stem Cell Institute, a Senior Associate member of the Broad Institute, and a Biomedical Engineer at the Brigham & Women's Hospital. The research in her laboratory is focused on the applications of micro- and nanotechnology for tissue repair and regeneration. Her work has been profiled by Scientific American, PBS NOVA, and The Economist.



MANOJ DURAISINGH

Associate Professor of Immunology and Infectious Diseases, Harvard School of Public Health

Manoj Duraisingh joined the Harvard School of Public Health in 2002, and is an Associate Professor in the Department of Immunology and Infectious Diseases. He is also an Associate Member at the Broad Institute, and a Burroughs Wellcome Fund New Investigator in the Pathogenesis of Infectious Diseases. He obtained his BA in Biochemistry from the University of Oxford, and an MSc and PhD in Molecular Parasitology from the London School of Hygiene and Tropical Medicine, conducting research on the molecular mechanisms of drug-resistance in the malaria parasite. Before joining the Harvard School of Public Health, Professor Duraisingh pursued postdoctoral research in molecular parasitology at the Walter and Eliza Hall Institute, applying molecular genetic approaches to study host cell invasion and the epigenetic regulation of malaria parasites.

Professor Duraisingh's research program focuses on the biology of host-parasite interactions in malaria. He is a world leader in the latest technologies associated with *P. falciparum* molecular genetics and has trained many researchers in these techniques. His laboratory uses transfection-based molecular and cell biological approaches to study the molecular mechanisms underlying the recognition and invasion of the human erythrocyte by the malaria parasite, and epigenetic regulation of multigene families that govern virulence processes in *Plasmodium*-infected erythrocytes. More recently, reverse genetic methods have been developed to functionally analyze host red blood cell determinants of malaria infection. Efforts are being made towards establishing *in vitro* culture and genetic systems for other human *Plasmodium* parasites, including *P. vivax* and *P. knowlesi*. Professor

Duraisingh is also engaged in field projects with collaborators and training programs in malaria-endemic areas, in particular Senegal, focused on studying parasite and host genetic determinants of malaria infection in



DAVID KASLOW

Director, PATH Malaria Vaccine Initiative

David C. Kaslow, MD, directs the PATH Malaria Vaccine Initiative (MVI), which seeks to accelerate the development of malaria vaccines and to ensure their availability and use in developing countries. Dr. Kaslow is a physician-scientist with more than 25 years of vaccine research and development experience and joined the MVI in March 2012.

Dr. Kaslow began his professional career at the National Institutes of Health (NIH), where he founded the Malaria Vaccine Development Unit. After 13 years at NIH, he moved to the private sector in 1999, working with Merck Research Laboratories (MRL) and Vical, Inc., a vaccine- focused biotechnology company. Mostly recently, Dr. Kaslow was Vice President and Head of Vaccines Project Leadership and Management at MRL, where his responsibilities included oversight of clinical biomarkers and project leadership and management of Merck Vaccine's pipeline.

The author of more than 150 scientific papers and two dozen review articles or book chapters, Dr. Kaslow's contributions as a research scientist include the cloning and characterization of several proteins involved in malaria parasite development in the mosquito, the first step toward development of one type of transmission-blocking vaccine. He has contributed to development of several malaria vaccine candidates, and has contributed to the vaccine application of delivery platforms such as adenovirus vectors and plasmid DNA for use against a variety of infectious diseases, including HIV. He holds or co-holds more than a dozen patents.

Dr. Kaslow has been awarded several professional honors, including the Chalmers Memorial Medal from the Royal Society of Tropical Medicine. He received an MD degree from the School of Medicine at the University of California, San Francisco, and a Bachelor of Sciences degree in Biochemistry from the University of California, Davis.



ERIC LANDER

Founding Director and President, Broad Institute,
Professor of Systems Biology, Harvard Medical
School

Eric Lander is Founding Director and President of the Broad Institute. Over the past 15 years, Eric and colleagues have developed many of the key tools and informational resources of modern mammalian genomics. They have developed new analytical and laboratory techniques that have been applied to a wide range of common diseases.

A recipient of numerous honors and awards, Eric has been appointed by President Obama to co-chair the President's Council of Advisors on Science and Technology. He is professor of biology at MIT and professor of systems biology at Harvard Medical School.

Eric earned his B.A. in mathematics from Princeton University (1978) and his Ph.D. in mathematics from Oxford University (1981) as a Rhodes Scholar.



DIDLER LEROY

Director, Drug Discovery, Research and Development, Medicines for Malaria Venture

Dr. Didier Leroy obtained a Magister in Microbiology and Enzymology (Master level) from the University of Nancy (France) in 1991 and a Ph.D. in Biochemistry/Structural Biology from the University J. Fourier in 1996.

From 1997 to early 2001, he worked as Post-Doctoral fellow in the laboratory of Professor Susan M. Gasser (now Head of the Friedrich Miescher Institute) at the Swiss Institute for Experimental Cancer Research. During that time he was awarded grants by the French Association for Cancer Research (ARC) and EMBO to work on antitumor drugs targeting topoisomerase II and on the chromatin condensation process respectively.

In 2001 he joined the Serono Pharmaceutical Research Institute in Geneva where he had the opportunity to lead a team dedicated to assay development and hit discovery. At the end of 2002, he was hired by the University of Geneva to establish and manage a proteomics laboratory. His team was funded by the NCCR "frontiers in genetics", OncoSwiss and the Spanish government.

In 2004, he was offered by Serono (MerckSerono in 2007) the possibility to manage a group of 10 collaborators to support Lead identification / optimization in the context of inflammation and neurodegenerative diseases. In parallel and with grants from FP6 ANTIMAL (EU project) and WHO/TDR in 2006, his group hosted 3 Post-Doctoral fellows working on drug discovery projects in the field of malaria.

In January 2009 Didier joined Medicines for Malaria Venture (MMV) as Associate Director Drug Discovery and was appointed Director in January 2012. In this context he is leading individual projects, miniportfolios and pharmacology platforms. His role is to help identify promising chemistry starting points for new antimalarials and improve them until the preclinical candidate stage. Part of his mission is to organize the whole biology strategy at MMV with a clear focus on transmission blocking, radical cure and drug resistance.



ALAN MAGILL

Director, Malaria, Global Health Program,
Bill & Melinda Gates Foundation

Alan Magill is the Director, Malaria, Global Health Program at the Bill & Melinda Gates Foundation. Dr. Magill is board-certified in internal medicine and infectious diseases. He has dual academic appointments as Associate Professor of Medicine and Associate Professor of Preventive Medicine and Biometrics at the Uniformed Services University of the Health Sciences. His primary research interests have been in malaria and leishmaniasis. His focus has been on new product development in vaccines, drugs, and diagnostics.

Previous positions include Program Manager (2009-2012) at the Defense Advanced Research Projects Agency (DARPA) where he developed and enabled a plant based vaccine production capability. He retired after 27 years active duty service in the US Army in 2010. He was formerly the Director of the Division of Experimental Therapeutics and the Science Director at the Walter Reed Army Institute of Research. Dr. Magill was previously the Head of Parasitology at the Naval Medical Research Center Detachment in Lima, Peru and the Head of Clinical Research for the Malaria Vaccine Development Unit of the U.S. National Institutes of Health.

He is a faculty member for the Gorgas Course in Clinical Tropical Medicine in Lima, and a sought after speaker on travel and tropical medicine-related topics. He participates in numerous national and international advisory committees and workshops. He is the current President Elect of the American Society of Tropical Medicine and Hygiene and a Past President of their Clinical Group. Dr. Magill is the immediate Past President of the International Society of Travel Medicine. He is the Lead Editor of the 9th edition of Hunter's Tropical Medicine, the premier clinical textbook of tropical medicine. He is also a Medical Editor of the CDC Health Information for International Travel (the yellow book) for 2010, 2012 and 2014. He has authored more than 70 peer reviewed publications, 125 abstracts, and 13 book chapters. He is a Master of the American College of Physicians, a Fellow of the Infectious Disease Society of America, and a Fellow of the American Society of Tropical Medicine and Hygiene.



DANIEL NEAFSEY

Group Leader, Malaria Genome Sequencing & Analysis, Broad Institute

Dan Neafsey's work focuses on the population genomics of malaria parasites and their Anopheline mosquito vectors. In his primary role as Group Leader of Malaria Genome Sequencing and Analysis at the Broad Institute, he plans and executes genome sequencing and high-throughput genotyping projects related to malaria and coordinates analysis of the data.

He applies analyses and tools from the fields of population genetics and molecular evolution to investigate questions such as the role of natural selection in *Plasmodium* and *Anopheles* genomes, the structure of parasite and vector populations, and the mechanisms by which resistance to drugs and insecticides evolves in parasites and vectors. He also coordinates efforts to adapt parasite genome sequencing to the constraints imposed by the small quantity and often poor quality of samples from clinical field studies of malaria.



MARK PARRINGTON

Senior Director, Head of the Technology Projects Group, Sanofi Pasteur

Dr. Parrington has over 21 years of industry experience in the research and development of live attenuated, vector-based and subunit-based vaccines against viral and bacterial pathogens, and cancer.

He joined Research at Sanofi Pasteur in 1991 and has held a number of roles in the company including, Head of Recombinant Vaccines, Director of the Microbiology Department and Canadian Head of Discovery Research in 2007. His research interests have been in the fields of DNA and RNA immunization, viral vector delivery systems, inactivated viruses, protein expression systems and subunit vaccines, targeting Influenza, Respiratory Syncytial virus, Parainfluenza viruses, Hantaviruses, HIV, Herpesviruses, Chlamydia, *Streptococcus pneumoniae*, and cancer targets including Melanoma and Colorectal.

Sanofi Pasteur has almost 20 years experience in malaria vaccine development, including two clinical trials. One was a Phase I/II safety, immunogenicity, and efficacy trial testing an attenuated poxvirus vector expressing 7 different *P. falciparum* antigens (NYVAC-Pf7). The other was a Phase I trial, testing a DNA vaccine expressing *P. falciparum* CSP. Dr. Parrington is currently leading an initiative to assess how the malaria vaccine landscape has changed since our last malaria vaccine project.

He obtained his Ph.D. in the field of Molecular Virology from the University of Ottawa. Dr. Parrington is an author on 11 scientific publications and an inventor on over 20 patents/patent applications.



ERICA PASINI

Scientist, Department of Parasitology,
Biomedical Primate Research Centre

Dr. Pasini studied chemistry and pharmaceutical technologies at the Faculty of Pharmacy, University of Milan, Italy from which she graduated with honors in March 1999. Between 1999-2002, Erica obtained her Ph.D. in drug chemistry, her pharmacist license from the Italian Order of Pharmacy and a M.S. in scientific journalism and science communication. In 2003, Dr. Pasini left Italy to join the groups of Professor Ward at the Liverpool School of Tropical Medicine in UK. There she expanded her background in malaria medicinal chemistry by acquiring skills and knowledge in parasite cell biology, biochemical parasitology and malaria transmission related aspects. In 2004, she joined the Department of Parasitology at the Biomedical Primate Research Centre in Rijswijk, The Netherlands. In Rijswijk, she was initially tasked with leading a project on the characterization of host and parasite using 'omics technologies. In this context, she contributed to the unraveling of the monkey parasite *P. knowlesi*'s genome and had the chance to investigate parasite and host by proteomics and transcriptomics. Her interest remains focused on aspects of malaria parasite blood stage biology. In this context, she is interested in developing long-term culture methodologies for different malaria parasites such as *P. vivax*, as a way to create an opportunity to further our knowledge on the biology of these parasites. Her scientific interest has further revolved around the study of parasite-host interactions, a multi-disciplinary enterprise that spans numerous disciplines including systems biology, malaria immunology and disease animal modeling.

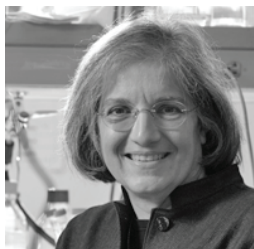


ELIZABETH WINZELER

Professor of Pharmacology & Drug Discovery,
University of California San Diego

Dr. Winzeler has been involved in public-private partnerships to place new antimalarial drugs in the development pipeline. Using novel cellular screening methods and reverse chemical genomics, her team has discovered several novel chemotypes for the treatment of malaria, several of which are now in clinical trials, as well as a handful of new chemically-validated antimalarial drug targets. She currently working to find new compounds that could might provide a radical cure for *P. vivax*, and has been using whole genome sequencing to study patterns of relapse and drug resistance in *P. vivax* from derived patients.

Dr. Winzeler received her B.S. from Lewis and Clark College, her M.S. from Oregon State University, and her Ph.D. from Stanford University. She joined the faculty at UCSD School of Medicine in 2012.



DYANN WIRTH

Richard Pearson Strong Professor of Infectious Diseases, Chair, Department of Immunology and Infectious Diseases, Harvard School of Public Health

Professor Dyann Wirth has been a major leader in the area of malaria research. Her work has provided completely new insight into how the malaria parasite has evolved, specifically in the areas of population biology, drug resistance and antigenicity. The Wirth laboratory blends the scientific environments of the Harvard School of Public Health, the Broad Institute, and collaborators from around the globe to create a unique malaria research and training network that brings together scientists with expertise in molecular biology, genetics, genomics, population genetics, chemistry, cell biology, epidemiology, computational biology, biostatistics, and leading clinicians in infectious diseases and pathology. Using this approach, the Wirth group is working to understand the mechanisms of drug resistance in *Plasmodium falciparum*, the major human malaria parasite. Leveraging the genomic tools of the human genomic project, the group has applied state of the art technologies and novel approaches to better understand the fundamental biology of the malaria parasite and mechanisms of drug resistance. Professor Wirth's research activities are made possible through collaborative research partnerships with investigators, universities, and clinical centers in Africa, Asia, and South America.

Together with partners in the malaria community, she is involved in a new university-wide effort to produce, transmit, and translate knowledge to support the control and ultimate eradication of malaria. The "Defeating Malaria: From the Genes to the Globe" initiative is being spearheaded by the Harvard School of Public Health in collaboration with the Harvard Global Health Institute, and it is being launched in partnership with the United Nations Special Envoy for Malaria.

She is Past President of the American Society of Tropical Medicine and Hygiene; a member of the Board of Directors of the Burroughs-Wellcome Fund and the Board of the Marine Biological Laboratory; she is also a member of The Institute of Medicine of the National Academy of Sciences and a Fellow of the American Academy of Microbiology.

NOTES

defeatingmalaria.harvard.edu