Malaria: From Innovation to Eradication

Scientific Organizers:
Marcel Tanner
Sarah K. Volkman
Marcus V.G. Lacerda
Salim Abdulla

Organized in collaboration with:
MESA – Malaria Eradication Scientific Alliance

MESA
MALARIA ERADICATION SCIENTIFIC ALLIANCE

Part of the Keystone Symposia Global Health Series

February 19–23, 2017

Speke Resort & Conference Centre
Kampala, Uganda

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on Molecular and Cellular Biology
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The app is available from **apps.eventmobi.com/ks, The App Store** or **Google Play** and can be used via your smartphone or laptop or tablet browser. You can download it ahead of time for offline access without a wifi connection. To learn more and watch a brief video, visit **www.keystonesymposia.org/ksapp**.

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Thank you to BioLegend for sponsoring our 2016–2017 season mobile app. Please see the inside back cover of this book for a message from BioLegend.

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This online version contains a correction to page 47 of the Poster Abstract Index. The printed version did not include poster number 1028 presented by Esan, Ayodele.

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#KSmalaria

Visit **www.keystonesymposia.org/17B5** to view the conference program online.

Note-taking pages available after page 67.

Unless otherwise noted, the information in this book is current as of **January 20, 2017**. If you registered after this date, your name is included in an online list accessed from attendees' Keystone Symposia accounts.

Please be advised that no video equipment, cameras, audio equipment or any other type of recording device will be allowed in the conference room or poster sessions. Full conference policies are on page 4.

KEYSTONE SYMPOSIA™
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info@keystonesymposia.org | www.keystonesymposia.org

Welcome

Dear Conference Participant,

I am delighted that you have chosen to join us for this Keystone Symposia conference. Over the next few days, we hope that you will be stimulated by new data, new ideas, and new connections with fellow scientists. In last year's attendee surveys, 82% of participants said that they learned something new that will change the direction of their research. We hope that you will experience a similar "Eureka" moment, too!

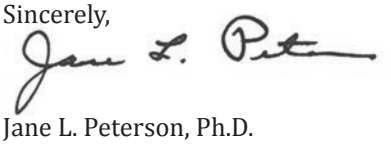
In 2016-2017, we will convene a record number of conferences – ten – outside North America, including our first sets of joint meetings abroad, in both Denmark and Ireland. We are also embarking on a two-year special celebration of diversity – in particular, to recognize the contributions that women scientists and those from underrepresented (UR) ethnic backgrounds make to the life sciences. One of our goals is to improve the numbers of UR and female scientists on the podium at each meeting. Our goal over the next two years is to increase the number of women on our programs by one percentage point per year to 32% of those speaking, the equivalent of the percent of women in assistant to full professor positions in academia. The percent of women giving short talks is already 40%+ of speakers, about the same as the ratio of women scientists in our audience. Even after we accomplish our goals, we will continue to strive to increase the number of women on our programs.

Increasing the number of UR scientists on our programs and at our meetings is more difficult. We have assembled an effective Diversity Advisory Committee that is helping us identify UR speakers. While our scholarships, travel awards and Fellows Program (see pages 17-18 for more information) do a good job of increasing overall participation, it is more challenging to increase the number of UR scientists speaking at the podium. We intend to increase this number by at least one percentage point annually to 4% of the total, and UR short talk speakers from 6.5% currently to 7.5% of the total. As with our global expansion, we will continually assess the progress of our efforts.

Keystone Symposia is a 501(c)(3) nonprofit organization. This means that we supplement registration fees with industry, foundation, government and individual donations and grants, enabling us to keep the registration fees as reasonable as possible, as well as to award scholarships and travel awards to deserving graduate students, postdoctoral fellows and early-career investigators. We are extremely grateful for this support.

We look forward to your feedback in the survey you will receive when the conference concludes, or by sending me an email.

Sincerely,



Jane L. Peterson, Ph.D.
President and Chief Executive Officer, Keystone Symposia
janep@keystonesymposia.org

Maximimizing Your Experience

The conference program has been designed around our mission: to accelerate life science discovery by providing a forum to present top-quality science, foster new collaborations and help prepare the next generation of life scientists.

Poster Abstract Sessions

Poster sessions play host to some of the most dynamic interactions that take place at our conferences and are not to be missed. Abstracts are numbered by session: abstracts presented during Poster Session 1 are numbered in the 1000s, Poster Session 2 in the 2000s, etc. Scientific organizers have selected short talks for plenary sessions and sometimes workshops from submitted poster abstracts. These oral poster abstract presentations may or may not fall on the same day as the presenter's poster session.

If you are a presenter, please check the index to find your abstract number; poster abstracts can be viewed on your Keystone Symposia online account and on the dedicated meeting mobile app. Speaker abstracts are also available on these two platforms, as well as after the program in this printed book in chronological order. To make the most of the formal poster sessions, we encourage you to preview posters during the time slots marked for informal poster abstract viewing.

Enjoying the Location

Please be aware of your environment as you plan your free time. If at a high-altitude conference, we urge you to rest on your first day and drink plenty of water. Check the bulletin board for group outings and other activities and discounts that Keystone Symposia and venue staff may have arranged.

Meals

The meals included in your registration vary by site. Check the program for meals marked "On Your Own" and plan accordingly. Meals listed with a time and place are provided as part of your registration. Some attendees choose to make a meal out of the evening social hour. Please note that alcohol and entertainment are not funded by registration fees or US government grants. Funding for this expense is generously provided by other supporters of Keystone Symposia.

Dear Colleague,

I am very pleased to send you greetings as the newly elected Chair of the Board of Keystone Symposia. Following eight highly effective years in this role, Dr. Juleen Zierath of the Karolinska Institutet stepped down in June 2016 at the conclusion of her scheduled term. She has kindly agreed to remain on the Board for an additional year as Chair of the Keystone Scientific Advisory Board. Assisting her in this endeavor will be newly appointed Deputy Chair of the Scientific Advisory Board, Dr. Margaret ("Peggy") Goodell of Baylor College of Medicine.

As Chair of the Scientific Advisory Board (SAB) for the past four years, I have witnessed firsthand the hard work and dedication of the Keystone Symposia staff, SAB members, Programming Consultants, and organizers who have put this conference together. Planning for this meeting started more than two years ago, in the autumn of 2014. At that time, review committees proposed the 2016-2017 conference topics, including some topics suggested through our online submission process (www.keystonesymposia.org/submitconcept). The Scientific Advisory Board then met in January and June 2015 to finalize these topics and propose scientific organizers. The location and speakers were identified in the summer of 2015.

The scientific organizers who put together this conference serve entirely in a volunteer capacity. Neither they nor the speakers receive an honorarium. We are very grateful for their tireless efforts. It is a reflection of the high quality of Keystone Symposia conferences that the world's top scientists make time and effort in their busy schedules to speak in the Keystone Symposia conferences.

And of course, we are grateful to you, the conference participants, for your interest in the exciting science that emerges from our meetings. Without your engagement and support, none of this would be possible. Thank you for choosing to share this time with us.

Sincerely,

Gary J. Nabel, M.D., Ph.D.
Chair, Keystone Symposia Board of Directors
Chief Scientific Officer, Sanofi

Meeting Books and Online Resources

Digital Meeting Book from Your Account

You may download a PDF of the meeting book from your Account on our secure website beginning seven days before the meeting and for up to 90 days afterwards. Your Account page also contains other useful content such as printable invoices and invitation letters, your profile with mail/email preferences, and much more. If you have questions about accessing your Account, don't hesitate to ask one of our on-site staff at the registration desk. If you find you prefer the digital format of the book, feel free to return this printed book to the registration desk.

Social Media Networks

Join us on the following social media platforms to stay informed, interact with other participants, and post your own photos, videos and text about your conference experience:

We Want Your Feedback!

Please be sure to give us your feedback by completing the survey that will be emailed to you at the conclusion of the meeting, as well as the briefer one on the mobile app. Your input is very valuable to us as we plan future conferences.

Keystone Symposia Mobile App

Our mobile app can be used on phones, tablets and laptops. Create an EventMobi account within the app to personalize your participant profile: upload a photo; add biographical information; take notes; and save a customized personal agenda for the week. Scan the QR code to the right to get the app from the Internet at **apps.eventmobi.com/ks.**

The app is available via:

Keystone Symposia Policies

Harassment Policy

Keystone Symposia is committed to maintaining a positive and respectful environment at its conferences and other events. We expect participants in our events to engage in constructive and professional discussion, in which all are valued for their scientific contributions and work. We value diversity, and desire that no participant should be subjected to harassment while involved in our events.

For purposes of this policy, harassment means unwelcome and offensive comments or behavior directed to the participant's sex, race, color, national origin, religion, sexual orientation or gender identity, disability or other status protected under applicable law. Harassment can include, for example, unwelcome attention, comments or jokes that focus on gender differences or sexual topics and that distract from the professional topics under discussion, unwelcome advances or requests for dates or sexual activities, and the use of language or images that demean or degrade persons of particular gender, racial, ethnic, religious or national identity.

To this end, we expect all participants to support these values and to avoid harassment of others participating in our conferences and other events. We expect all attendees to assist in ensuring that Keystone Symposia events are free from harassment of any kind, including reporting any instances of harassment directly to Dr. Jane Peterson, CEO, at **janep@keystonesymposia.org** and/or Dr. Thale Jarvis, CSO, at **thalej@keystonesymposia.org**. Anyone who has experienced harassment, or who has witnessed such behavior, should notify one of the above persons as soon as possible.

Persons who act contrary to these values and expectations may be warned or asked to leave the event in which the behavior occurred, may be excluded from access to Keystone Symposia conferences and/or other events, and/or may be subject to other disciplinary or corrective action, at the discretion of Keystone Symposia.

Privacy Policy

Keystone Symposia is committed to protecting the privacy of its website visitors and meeting attendees. Keystone Symposia collects personal information when individuals register for our meetings and upon a visitor's request to subscribe to newsletters and meeting announcements (both print and online). Information that our visitors and attendees provide or that is derived from internal website tracking is not sold, rented or shared with any third-party individual or organization. Once on our mailing lists, individuals always have the option of unsubscribing so that they no longer receive all or certain types of our communications.

By participating in a Keystone Symposia meeting, attendees acknowledge that their name and photograph may be published in a limited fashion in materials produced by Keystone Symposia. For example, to make the meeting a more valuable experience for all involved, attendee names and institutions are listed on our website in a secure section accessible only by attendees of the same meeting. Attendee names and institutions are also pre-populated in our secure mobile app, but attendees decide for themselves whether to enter further information in the app.

Attendee names and contact information are also listed in the meeting book. Except in the meeting book in this fashion, we will not disclose attendee contact information, even to other attendees. Photographs of meeting interactions taken by Keystone Symposia may occasionally be used in our marketing literature.

For our full privacy policy, please visit **www.keystonesymposia.org/privacy**.

If you have any further questions or comments about our privacy policy, please send your feedback to **info@keystonesymposia.org**.

Meeting Room Policy

No video equipment, cameras, audio equipment or any other type of recording device will be allowed in the meeting rooms or poster sessions. Occasionally, Keystone Symposia may use such devices for its own publicity purposes. While we do not prohibit laptop computers, cell phones and PDAs, they must not be used for recording and should be operated in "silent" mode out of consideration for speakers and other conference attendees.

Attendees will be required to wear name badges for access to meeting sessions. Due to problems we have encountered at some meetings, we will be performing random badge checks. Attendees without badges will be turned away from the session.

Please note that spouses traveling with registered conference attendees are not permitted inside the sessions unless they pay the registration fee. However, they are welcome to attend evening receptions. They may attend breakfasts upon payment of a nominal daily fee.

Media and Communications Policy

Keystone Symposia recognizes that presenters of scientific data may have reasons for not wanting early results reported to the general public prior to peer review. We also recognize, however, that raising society's level of science knowledge and awareness is essential for appropriate scientific input into public policy and decision-making by political leaders, which is in everyone's best interest. We therefore encourage and will try to facilitate interactions between the scientists attending our conferences and the media. We ask both to be understanding when considering each other's objectives and the overarching goal of raising science literacy worldwide.

If approached with sufficient advance notice, Keystone Symposia can provide assistance to journalists to contact our speakers and abstract authors directly. We can prearrange interviews with specific meeting organizers, speakers, authors or Keystone Symposia staff.

We ask that all writers attending a Keystone Symposia conference gain approval from a speaker or poster presenter prior to quoting or publishing that individual's scientific results. This policy applies whether you are a professional writer/journalist or a non-journalist blogging about the conference or otherwise sharing information among a group of individuals.

Audio, still photo and video recording by any device (e.g., cameras, laptops, PDAs, cell phones, watches) is strictly prohibited during the sessions, unless in certain circumstances when prior permission must be obtained from Keystone Symposia. Photographs taken by Keystone Symposia may be available on request.

Keystone Symposia welcomes members of the scientific and general media at our meetings. Due to the costs of providing meals and other facilities, payment of the regular registration fee is required. Keystone Symposia may be able to give some consideration to journalists from nonprofit organizations, as well as to journalists who wish to attend the meeting for just one day. Such inquiries and arrangements should be made in advance.

Keystone Symposia does not require our presenters to submit papers, nor do we record or transcribe our sessions. Speaker abstracts are available in the meeting book provided to each registrant. Meeting books are available after the meeting to non-attendees for a nominal fee.

Keystone Symposia provides a venue for scientists to come together and share their ideas with each other in a relaxed setting. While we wish to accommodate members of the press, we ask that all members of the media respect our mission and the freedom we allow our scientists to discuss their work in a protected and informal environment.

If you have questions about this policy, contact Yvonne Psaila, Director of Marketing and Communications, **yvonnep@keystonesymposia.org**, **1.970.262.2676**.

Policy for Displaying Literature at Keystone Symposia Meetings

Keystone Symposia provides financial and in-kind donors with the ability to display a limited amount of literature or small promotional items on a table near the registration desk at Keystone Symposia meetings. Financial donors at certain levels can also insert literature into delegate bags at the specific meeting(s) they have chosen to support. Literature placed by organizations that are not current supporters will be removed until the meeting participant who placed it can be contacted.

Please contact the following Keystone Symposia staff if you are interested in displaying literature at our meetings and becoming a donor:

Financial support (e.g., corporations, foundations):	**Sarah Lavicka**, Assistant Director of Development **1.970.262.2690**; **sarahl@keystonesymposia.org**
In-kind support (e.g., publishers, societies/associations, conference organizers):	**Yvonne Psaila**, Director of Marketing and Communications **1.970.262.2676**; **yvonnep@keystonesymposia.org**

Nonprofit, academic and government institutions may post a flyer about grant and job opportunities or upcoming events of interest on the bulletin board in the registration area, and job postings can also be placed on the meeting mobile app. Please see a Keystone Symposia on-site representative if you need help with this or have questions while at the conference.

Malaria: From Innovation to Eradication

Scientific Organizers:
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The evidence base and research agenda for malaria elimination and eradication are fast-evolving. Of foremost concern is the threat of resistance of the mosquito to pyrethroid insecticides and emerging data showing multi-drug resistance in Southeast Asia. An evolving area, with much to be understood, is the epidemiology of sub-microscopic infections and how they fuel onward transmission. There is also a lot of progress; for example, in the development pipeline there are candidates for a single-dose cure that can also provide protection and block transmission, and there are novel classes of insecticides. Finally, in implementation science, there is plenty to examine, from mass drug administration of anti-malarials to re-purposing ivermectin to reduce residual transmission. This Keystone Symposia meeting examines the scientific progress being made toward the goals of eliminating and eradicating malaria, from biological challenges and discoveries, to the development of the next generation of tools, to potentially transformative strategies to eliminate malaria. The ultimate goal of the meeting is to provide a unique and needed space for the malaria community to challenge hypotheses and share emerging data and insights from the different disciplines in a retreat-like setting where scientists can network, think creatively and exchange ideas. For the sustainability needed to meet the challenge of eradicating malaria, fostering these fruitful exchanges and lasting scientific partnerships is absolutely critical.

*Schedule may have changed since this book was prepared. Visit **www.keystonesymposia.org/17B5** and the conference mobile app at **apps.eventmobi.com/ks** for the most up-to-date program. Hashtag for this meeting: **#KSmalaria***

SUNDAY, FEBRUARY 19

16:00–20:00	Majestic Hall	Arrival and Registration (continued)
18:00–20:00	Majestic Hall	Welcome Mixer

MONDAY, FEBRUARY 20

08:00–09:00	Individual Hotel	Breakfast
09:00–09:15	**Victoria Ballroom**	**Opening Remarks** ***Marcel Tanner**, Swiss Tropical and Public Health Institute, Switzerland **Jimmy Opigo**, National Malaria Control Programme, Uganda
09:15–10:00	**Victoria Ballroom**	**Keynote Address** ***Marcel Tanner**, Swiss Tropical and Public Health Institute, Switzerland **Pedro L. Alonso**, World Health Organization, Switzerland *The Science Needed to Reach our Goals for Malaria Elimination*
10:00–12:30	**Victoria Ballroom**	**Identifying, Characterizing the Reservoir and Measuring Transmission** ***Sarah K. Volkman**, Harvard T.H. Chan School of Public Health, USA **Salim Abdulla**, Ifakara Health Institute, Tanzania *Towards Tackling Asymptomatics in Africa* Coffee Break **Chris Drakeley**, London School of Hygiene & Tropical Medicine, UK *Malaria Transmission: Characterizing and Emptying the Reservoir* **Jetsumon Sattabongkot Prachumsri**, Mahidol University, Thailand *Transmission Stages in Plasmodium vivax* **Ana Maria Fonseca**, ISGlobal, Barcelona Institute for Global Health, Spain (1030) *Short Talk: Pregnancy-Specific Serology to Monitor Malaria Transmission in Elimination Contexts* **Silvia Portugal**, University Hospital Heidelberg, Germany (3011) *Short Talk: The Silent Reservoir of P. falciparum during the Dry Season* On Own for Lunch
12:30–13:00	Victoria Ballroom	Poster Setup
13:00–22:00	Victoria Ballroom	Poster Viewing
14:30–16:30	**Victoria Ballroom**	**Workshop and Panel: New Diagnostics for Malaria Elimination** ***Organized in collaboration with PATH, FIND and the Bill & Melinda Gates Foundation*** ***Sophie Allauzen**, Bill and Melinda Gates Foundation, USA ***Iveth Gonzalez**, Foundation for Innovative New Diagnostics, Switzerland ***Gonzalo J. Domingo**, PATH, USA
16:30–17:00	Victoria Ballroom Foyer	Coffee Available

*Full talk speaker abstracts can be viewed in chronological order beginning on page 29. Short talk speaker abstracts can be found on your Keystone Symposia online account or on the meeting mobile app at **apps.eventmobi.com/ks** (abstract number is shown in parentheses in the program above).*

MONDAY, FEBRUARY 20 (continued)

17:00–19:00 **Victoria Ballroom**

Modeling and Mobility

***Marcus V.G. Lacerda**, Tropical Medicine Foundation Dr. Heitor Vieira Dourado, Brazil

Hannah Slater, Imperial College, UK
Modeling Malaria Elimination Strategies in Zambia

Stephan Karl, Walter and Eliza Hall Institute of Medical Research, Australia
Ability of Different Markers of Exposure to Detect Residual "Pockets" of Transmission

Oliver Medzihradsky, University of California, San Francisco, USA (2023)
Short Talk: Assessment of Three Methods of Hotspot Prediction in the Pre-Elimination Setting of Zambezi Region, Namibia

19:00–20:00 Victoria Ballroom Foyer — Social Hour with Lite Bites

19:30–22:00 **Victoria Ballroom**

Poster Session 1

Poster sessions provide exciting opportunities for engagement between all levels of investigators. Abstracts beginning with the number 1 are featured during this poster session.

TUESDAY, FEBRUARY 21

08:00–09:00 Individual Hotel — Breakfast

09:00–12:00 **Victoria Ballroom**

Combining and Tailoring Intervention Packages for Elimination Settings

***Jimmy Opigo**, National Malaria Control Programme, Uganda

Kafula Silumbe, Malaria Control and Elimination Partnership in Africa, PATH, Zambia
Pushing for Malaria Elimination by Steps: The Case of Zambia

Caterina Guinovart, Barcelona Institute for Global Health, Spain
Different Drug Administration Strategies and Reactive Case Investigation in Sub-Saharan Africa

Coffee Break

Melissa Penny, Swiss Tropical and Public Health Institute, Switzerland
Optimizing New Malaria Interventions and Intervention Mixes for Different Settings

Gareth R. Jones, Clinton Health Access Initiative, Uganda (2002)
Short Talk: Assessing National Malaria Surveillance Systems Across East Africa

Krystal Lorna Nkusi Birungi, Uganda Virus Research Institute, Uganda (1016)
Short Talk: Population Dynamics-Species Composition, Abundance and Diversity of Anopheles Malaria Vectors at Kiimi and Nsadzi Islands in Uganda

On Own for Lunch

12:00–13:00 Victoria Ballroom — Poster Setup

13:00–22:00 Victoria Ballroom — Poster Viewing

16:30–17:00 Victoria Ballroom Foyer — Coffee Available

TUESDAY, FEBRUARY 21 (continued)

17:00–19:15 **Victoria Ballroom** **Health Systems**

***Marcel Tanner**, Swiss Tropical and Public Health Institute, Switzerland
Irene Misuka Masanja, Ifakara Health Institute, Tanzania
Understanding Access and Delivery – Responding to Efficacy Decay
Kathryn W. Roberts, Global Health Group at the University of California, San Francisco, Namibia
Surveillance as an Intervention: Geo-Spatial Approaches to Identify and Target Malaria Transmission
Valentina Buj, UNICEF, Kenya
Innovations in Malaria Service Delivery to Accelerate Progress towards Malaria Elimination
Sumadhya Deepika Fernando, Faculty of Medicine, Colombo, Sri Lanka (1029)
Short Talk: The Risk of Imported Malaria in Security Forces Personnel Returning from Overseas Missions in the Context of Prevention of Reintroduction of Malaria to Sri Lanka
Vladimir P. Zharov, University of Arkansas for Medical Sciences, USA (3034)
Short Talk: Ultrasensitive Noninvasive Label-Free Photoacoustic Malaria Diagnosis and Eradication

19:15–20:15 Victoria Ballroom Foyer Social Hour with Lite Bites

19:30–22:00 **Victoria Ballroom** **Poster Session 2**

Poster sessions provide exciting opportunities for engagement between all levels of investigators. Abstracts beginning with the number 2 are featured during this poster session.

WEDNESDAY, FEBRUARY 22

08:00–09:00 Individual Hotel Breakfast

09:00–12:15 **Victoria Ballroom** **Tools for Elimination**

***Salim Abdulla**, Ifakara Health Institute, Tanzania
Marcus V.G. Lacerda, Tropical Medicine Foundation Dr. Heitor Vieira Dourado, Brazil
Antimalarial Drugs Challenges for Malaria Eradication
Kelly Chibale, University of Cape Town, South Africa
Targeting the Plasmodia at Multiple Lifecycle Stages: A Chemotherapy Approach towards Malaria Eradication

Coffee Break

Stephen L. Hoffman, Sanaria, USA
Rationale and Plans for Using a PfSPZ-Based Vaccine in Malaria Parasite Elimination Campaigns
Louis Schofield, James Cook University, Australia
Vaccines to Interrupt Transmission
Itziar Ubillos, ISGlobal, Barcelona Institute for Global Health, Spain (3028)
Short Talk: Immunogenicity Elicited by the Malaria Vaccine Candidate RTS,S/AS01E in African Children: Effect of Age, Malaria Transmission Intensity and Association with Protective Efficacy
Umberto D'Alessandro, MRC Unit The Gambia, Gambia (1024)
Short Talk: Malaria Residual Transmission After Mass Drug Administration with Dihydroartemisinin-Piperaquine in The Gambia

On Own for Lunch

WEDNESDAY, FEBRUARY 22 (continued)

12:15–13:00	Victoria Ballroom	Poster Setup
13:00–22:00	Victoria Ballroom	Poster Viewing
16:30–17:00	Victoria Ballroom Foyer	Coffee Available
17:00–19:00	**Victoria Ballroom**	**Tackling the Mosquito Vector** ***Jetsumon Sattabongkot Prachumsri**, Mahidol University, Thailand **Charles Wondji**, Liverpool School of Tropical Medicine, UK *Complex Genomic Evolution of Insecticide Resistance in Malaria Vectors: A Challenge for Vector Control* **John Lucas**, Sumitomo Chemical Company, UK *Meeting the Challenge of Insecticide Resistance* **Krijn Paaijmans**, ISGlobal, Barcelona Institute for Global Health, Spain *On Mosquitoes and Headless Chickens: Entomological Intelligence on the Road to Malaria Elimination* **Sheila Ogoma Barasa**, US Army Medical Research Directorate Kenya, Kenya (1013) *Short Talk: A Low-Technology Emanator Treated with the Volatile Pyrethroid Transfluthrin Confers Long-Term Protection against Outdoor Biting Vectors of Lymphatic Filariasis, Arboviruses and Malaria*
19:00–20:00	Victoria Ballroom Foyer	Social Hour with Lite Bites
19:30–22:00	**Victoria Ballroom**	**Poster Session 3** *Poster sessions provide exciting opportunities for engagement between all levels of investigators. Abstracts beginning with the number 3 are featured during this poster session.*

THURSDAY, FEBRUARY 23

08:00–09:00	Individual Hotel	Breakfast
09:00–12:15	**Victoria Ballroom**	**Understanding Parasite Interactions with Human and Mosquito Hosts** ***Sanjeev Krishna**, St. George's Hospital Medical School, UK **Rhoel R. Dinglasan**, University of Florida, USA *From Discovery to Implementation: Interventions that Block Malaria Parasite Transmission at the Bite* **Sarah K. Volkman**, Harvard T.H. Chan School of Public Health, USA *Leveraging Genomics to Advance the Malaria Elimination Agenda* Coffee Break **Alfred Cortes Closas**, ISGlobal, Barcelona Institute for Global Health, Spain *Epigenetic Variation in Malaria Parasites: Sex, Drugs and... Adaptation* **Abdoulaye Djimdé**, University of Science, Techniques and Technologies, Mali *Significant Different Levels of Artemisinin Monotherapy Efficacy on P. falciparum in Mali* **Didier Menard**, Institut Pasteur du Cambodge, Cambodia *Artemisinin and Drug Partner Resistance: From Phenotype to Genotype* On Own for Lunch

THURSDAY, FEBRUARY 23 (continued)

16:30–17:00	Victoria Ballroom Foyer	Coffee Available
17:00–18:15	**Victoria Ballroom**	**Surveillance Strategies** ***Kimberly A. Lindblade**, World Health Organization, Switzerland **Moses R. Kamya**, Makerere University College of Health Sciences, Uganda *Impact of Malaria Control Interventions in Uganda* **Abdisalan Mohamed Noor**, World Health Organization, Switzerland *Malaria Surveillance as Intervention along the Pathway to Elimination*
18:15–19:00	**Victoria Ballroom**	**Closing Keynote Address** **Marcel Tanner**, Swiss Tropical and Public Health Institute, Switzerland *Global Travel, Migration, Impact and Risks of Malaria Re-Introduction*
19:00–19:15	**Victoria Ballroom**	**Meeting Wrap-Up: Outcomes and Future Directions (Organizers)**
19:15–20:15	Poolside Lawn	Social Hour with Lite Bites
20:00–23:00	Poolside Lawn	Entertainment

FRIDAY, FEBRUARY 24

Departure

Thank you…

…to all our donors supporting this conference. Their generosity and dedication to the mission of collaborative science distinguish them as valuable members of the Keystone Symposia community.

This conference is organized in collaboration with:
MESA – Malaria Eradication Scientific Alliance

The conference is part of the
Keystone Symposia Global Health Series,
supported by the ***Bill & Melinda Gates Foundation***

Additional support for this conference provided by:

Directors' Fund
(contributors noted by asterisks on blue pages)

In-kind speaker support for this conference provided by:

Sanaria Inc.

Sumitomo Chemical Company

Scholarship and Travel Award Recognition

Congratulations

The following participants were awarded financial aid to attend this meeting. Be sure to stop by their poster sessions to see the abstracts that earned their merit-based support. Poster numbers are listed in parentheses, with the first digit indicating the corresponding poster session. Visit ***keystonesymposia.org/financialaid*** *for more information on Keystone Symposia's scholarship and travel award opportunities.*

The following scholarship recipients are funded by:

Keystone Symposia Future of Science Fund*

Ana Maria Fonseca, Barcelona Institute for Global Health, ISGlobal, Spain (1030)

Godfrey W. Mayoka, University of Cape Town, South Africa (2022)

Eduard Rovira-Vallbona, Institute of Tropical Medicine – Antwerp, Belgium (3017)

Raul G. Saraiva, Johns Hopkins Bloomberg School of Public Health, USA (3019)

Itziar Ubillos, ISGlobal, Spain (3028)

MESA – Malaria Eradication Scientific Alliance

Paulo Arnaldo, Instituto Nacional de Saude, Mozambique (1007)

Vito Baraka, NIMR Tanzania, Tanzania (1012)

Adilson DePina, CCS-SIDA, Cape Verde (1026)

Francis T. Kimani, Kenya Medical Research Institute, KEMRI, Kenya (2006)

Inke Nadia Diniyanti Lubis, London School of Hygiene & Tropical Medicine, Indonesia (2014)

Gordon Mayen, Lakes State Ministry of Health, South Sudan (2021)

Reagan M. Mogire, Pan African University Institute for Basic Sciences and Innovation, Kenya (2027)

Victor Irungu Mwangi, Institute of Primate Research, Kenya (2030)

Agonhossou Romuald, FORS/ ISBA, Benin (3015)

Rosa Amélia Gonçalves Santana, Fundação de Medicina Tropical, Brazil (3018)

*To learn more about the Keystone Symposia Future of Science Fund, see page 27 or visit **keystonesymposia.org/** ( ) = abstract number

The following participants were awarded financial aid to attend this meeting. Be sure to stop by their poster sessions to see the abstracts that earned their merit-based support. Poster numbers are listed in parentheses, with the first digit indicating the corresponding poster session. Visit ***keystonesymposia.org/financialaid*** *for more information on Keystone Symposia's scholarship and travel award opportunities.*

Keystone Symposia Global Health Travel Award Recipients

Made possible by funding from the Bill & Melinda Gates Foundation

Manfred Mario Kokou Accrombessi, Centre d'Étude et de Recherche sur le Paludisme Associé à la Grossesse et l'Enfance, Benin (1001)

Chinenye Afonne, School of Public Health, Ghana (1002)

Chinazom Precious Agbo, University of Nigeria, Nigeria

Koffi Mensah Ahadji-Dabla, University of Lomé, Togo (1003)

Olugbenga Akinola, University of Ilorin, Nigeria

John Adeolu Alli, University College Hospital, Nigeria

Uchenna Blessing Alozieuwa, Federal University of Technology, Nigeria

Lis Antonelli, Fiocruz, Brazil

Philip Emka Anyanwu, University of Sunderland, UK (1006)

Protus Arrey Tarkang, Institute of Medical Research and Medicinal Plants Studies, Cameroon

Mohd Asad, International Centre for Genetic Engineering and Biotechnology (ICGEB), India (1008)

Shehu Shagari Awandu, University of Pretoria, South Africa (1010)

Emmanuel Afolabi Bakare, Federal University Oye Ekiti, Ekiti State, Nigeria (1011)

Sheila Ogoma Barasa, US Army Medical Research Directorate, Kenya (1013)

Ibrahim Sebutu Bello, Obafemi Awolowo University Teaching Hospital, Nigeria (1015)

Oloyede Samuel Bolaji, Ladoke Akintola University of Technology, Nigeria

Felix Abekah Botchway, University of Ghana Medical School, Ghana (1017)

Modupe Iretiola Builders, Bingham University, Nigeria (1018)

Agnes C. Cheruiyot, Maseno University, Kenya (1021)

Uchechukwu Chukwuocha, Federal University of Technology, Nigeria (1022)

Bismarck Dinko, University of Health and Allied Sciences, Ghana

Titus Henry Divala, University of Malawi, College of Medicine, Malawi

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Keystone Symposia Global Health Travel Award Recipients (continued)

Made possible by funding from the Bill & Melinda Gates Foundation

Ayodele Jacob Esan, Federal Teaching Hospital, Nigeria (1028)

Mofolusho O. Falade, University of Ibadan, Nigeria

Sumadhya Deepika Fernando, Faculty of Medicine, Colombo, Sri Lanka (1029)

Erika Francisca Garrido, Corporación Universitaria Remington, Colombia

Ritu Gill, Centre for Biotechnology, India

Jesse N. Gitaka, Mount Kenya University, Kenya

Himanshu Gupta, Barcelona Institute for Global Health – ISGlobal, Spain

Umar Adam Katsayal, Ahmadu Bello University, Nigeria (2005)

Andreas Adutwum Kudom, University of Cape Coast, Ghana

Eliningaya J. Kweka, Tropical Pesticides Research Institute, Tanzania (2010)

Josué Costa Lima-Junior, Fundação Oswaldo Cruz, Brazil

Maxwell Gesuge Machani, Kenya Medical Research Institute, Kenya (2015)

Victoria Makuru, University of Notre Dame, USA (2017)

Gloria Graca Ernesto Matambisso, Centro de Investigação em Saúde de Manhiça, Mozambique

Misganaw Birhaneselassie Mengesha, Hawassa University College of Medicine and Health Sciences, Ethiopia

Hammed Oladeji Mogaji, Federal University Oye-Ekiti, Nigeria (2026)

Afsaneh Motevalli Haghi, Tehran University of Medical Sciences, Iran

Petra O. Nnamani, University of Nigeria Nsukka, Nigeria (3001)

Ishaya Haruna Nock, Ahmadu Bello University, Nigeria

Dickson Shey Nsagha, University of Buea, Cameroon (3003)

Sam Lubwama Nsobya, Makerere University, Uganda

Suci Nuralitha, Eijkman Institute of Molecular Biology, Indonesia (3004)

The following participants were awarded financial aid to attend this meeting. Be sure to stop by their poster sessions to see the abstracts that earned their merit-based support. Poster numbers are listed in parentheses, with the first digit indicating the corresponding poster session. Visit ***keystonesymposia.org/financialaid*** *for more information on Keystone Symposia's scholarship and travel award opportunities.*

Keystone Symposia Global Health Travel Award Recipients (continued)

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Daniel Olusola Ojurongbe, Ladoke Akintola University of Technology, Nigeria

Babatunde Meshach Okanlawon, Ladoke Akintola University of Technology, Nigeria

Subulade Abigail Olaniyan, Institute of Child Health, Nigeria

Luicer Anne Ingasia Olubayo, Walter Reed Project, Kenya (3008)

Adewole Olalubi Oluwasogo, Kwara State University, Nigeria (3009)

Olufunke Abiodun Oluwatoba, College of Medicine, University of Ibadan, Nigeria

Bose Etaniamhe Orimadegun, College of Medicine, University of Ibadan, Nigeria

Abisoye Sunday Oyeyemi, Niger Delta University, Nigeria

Bernice Enobong Udoh, Olabisi Onabanjo University, Nigeria (3029)

Chairat Uthaipibull, National Center for Genetic Engineering and Biotechnology, Thailand

Oyindamola Bidemi Yusuf, University of Ibadan, Nigeria

Conference Assistant

We would like to thank our conference assistant for contributing to this meeting. This individual assists the scientific organizers and Keystone Symposia's onsite staff throughout the meeting and compiles a meeting summary for submission to our government financial supporters.

Konstantina Boutsika, Swiss Tropical and Public Health Institute, Switzerland

Marcel Tanner, PhD is Professor of Epidemiology and Medical Parasitology and Chair of the Faculties of Science and Medicine at the University of Basel in Switzerland. He is also Director emeritus of the Swiss Tropical and Public Health Institute in Basel and current President of the Swiss Academy of Science.

Dr. Tanner earned an MSc in Medical Zoology and a PhD in Medical Parasitology from the University of Basel and an MPH from the London School of Hygiene and Tropical Medicine. His area of research focus is communicable disease control, mainly relating to malaria and schistosomiasis. He has done extensive field work in Africa and Asia and is the author of more than 600 original papers in peer-reviewed journals, 21 book chapters, more than 400 published short communications and abstracts, and numerous evaluation reports and studies for governments and international agencies. He is also co-editor of two books on urban health and urbanization.

Sarah K. Volkman, PhD is a Principal Research Scientist in the Department of Immunology and Infectious Diseases at the Harvard T.H. Chan School of Public Health in Boston, Massachusetts, USA. She is part of the Malaria Diversity Project at The Broad Institute, and Professor of Nursing at the School of Nursing and Health Sciences at Simmons College. Her research focuses on malaria population genetic diversity related to changes in transmission and drug resistance. Dr. Volkman earned a Bachelor's degree from the University of California, San Diego (cum laude) in 1986 and a doctoral degree from the Harvard T.H. Chan School of Public Health in 1995. She conducted postdoctoral studies with Professor Dyann Wirth at the Harvard T.H. Chan School of Public Health and was appointed senior research scientist in 1998. Dr. Volkman is a member of the Scientific Advisory Committee for the WorldWide Antimalarial Resistance Network (WWARN) and a member of the Malaria Disease Reference group of TDR at the World Health Organization.

Marcus V.G. Lacerda, PhD is a physician and Director of Research at the Tropical Medicine Foundation Dr. Heitor Vieira Dourado (FMT-HVD) in Manaus, Brazil, as well as a researcher at Instituto de Pesquisas Leônidas & Maria Deane (FIOCRUZ-Amazonas), a collaborator of the Graduate Program on Tropical Medicine at the University of the Amazonas State, and adjunct professor at Kent State University, USA. He has more than 14 years' experience working on the clinical aspects of malaria and its pathogenesis. Since 2007, he has led a reference center for malaria research known as the International Center for Clinical Malaria Research (CIPCliM), which collaborates with many groups across the world (US, Spain, Portugal, Australia, India, Papua New Guinea, Colombia, Peru) and is focused on technology transfer to the Brazilian Amazon through the training of PhDs and postdocs. Dr. Lacerda is on the Technical Advisory Committee of the Brazilian Program of Malaria Control and the Committee on Antimalarial Therapy of the Brazilian Ministry of Health, and also serves as an occasional consultant to the World Health Organization on *Plasmodium vivax.* He is actively involved in malaria eradication initiatives such as malERA, MESA and the Mesoamerica Initiative.

Dr. Lacerda earned his MD from the University of Brasília and his PhD in Tropical Medicine from the University of Brasília, in partnership with New York University. He is currently President of the Brazilian Society of Tropical Medicine.

Salim Abdulla, PhD is the former Chief Executive Director of Ifakara Health Institute (IHI) in Dar es Salaam, Tanzania. He trained as a medical officer and pursued training in epidemiology at the London School of Hygiene and Tropical Medicine (MSc) and Swiss Tropical Institute (PhD). Dr Abdulla joined IHI in 1996 and has been extensively involved in the evaluation of malaria vaccines and new malaria treatments for regulatory licensure. Previously, he managed large-scale evaluation of insecticide-treated bednets and artemisinin-based combinations therapy for national policy formulation. He was also involved in multi-country evaluation of mortality patterns and malaria transmission in demographic surveillance sites across Africa. Dr Abdulla founded and led the Bagamoyo Research and Training Centre, the branch of IHI responsible for biomedical and clinical research and training. Dr. Abdulla has published extensively on malaria intervention strategies and has an interest in the translation of research results into policy, clinical epidemiology and capacity development issues. He serves as a technical advisor to various technical committees in Tanzania and internationally. He has received a number of international awards including the centenary medal of the Royal Society of Tropical Medicine and Hygiene in the UK in 2007 and the Donald Reid Medal in 2015.

Keystone Symposia on Molecular and Cellular Biology

About Keystone Symposia

Keystone Symposia on Molecular and Cellular Biology is a 501(c)(3) nonprofit organization headquartered in Silverthorne, Colorado, USA that convenes open, peer-reviewed conferences across a broad range of the life sciences. Our mission is to accelerate life science discovery by providing a forum to present top-quality science, foster new collaborations and help prepare the next generation of life scientists. Approximately 50–60 conferences take place each year. More than half the symposia are held in mountain venues across the American and Canadian West, with the remainder primarily in North American cities and various global locations. We have now convened conferences on five continents: Africa, Asia, Australia, Europe and North America. The first in South America was held in Ouro Preto, Brazil in May 2013.

Keystone Symposia receives revenue from two sources: registration fees (approximately 65-70%) and generous support from corporations, foundations, government entities and individuals (approximately 30-35%). This support provides funding for scholarships as well as speaker travel expenses (subsidies are based on economy-rate travel and no honoraria are paid), allowing registration fees to be kept as low as possible. Many speakers forego expense reimbursement to provide more funds for scholarships.

Under the direction of Chief Executive Officer Jane Peterson, Chief Scientific Officer Thale Jarvis and an advisory Board of Directors, a staff of approximately 45 full-time, part-time or seasonal employees handles all aspects of administration, meeting management/logistics, attendee services, fundraising and marketing.

How Keystone Symposia Conferences Are Programmed

All Keystone Symposia conferences are developed through a rigorous peer-review system that involves the coordinated efforts of a Scientific Advisory Board (SAB) comprised of more than 90 leading scientists from academia, industry and government worldwide, as well as approximately 500 programming consultants who provide additional expertise in specific scientific areas.

Meeting development starts more than two years in advance through teleconference and online discussion forums involving SAB members and study group programming consultants. This process generates information on trending scientific areas and new meeting ideas. The SAB then convenes in Keystone, Colorado in January and uses the study group-generated information to identify conference topics, suggest potential scientific organizers, make recommendations regarding meeting content and identify meetings that could be held jointly. Based on the recommendations of the SAB, Keystone Symposia staff solicits conference organizers and helps them prepare programs for peer review.

The SAB meets again in June to review all submitted meeting proposals, recommend whether proposals should be accepted and provide constructive feedback to organizers.

Keystone Symposia's History

Founded in 1972 in Los Angeles as the ICN-UCLA Symposium on Molecular Biology by Professor C. Fred Fox, the organization evolved into UCLA Symposia before relocating to Silverthorne, Colorado in 1990. At that time we became a free-standing division of a nonprofit called The Keystone Center and were renamed Keystone Symposia on Molecular and Cellular Biology. We separated from The Keystone Center and became an entirely independent nonprofit in a phased transition beginning in 1995 and ending in 1997.

Attendees at the first Keystone Symposia meeting in Squaw Valley in 1972.

Notable Milestones

1972: Keystone Symposia was founded as the ICN-UCLA Symposium on Molecular Biology and held an initial conference on membrane research in Squaw Valley, California, March 13-17, 1972.

1984: Keystone Symposia convened the first-ever open, international meeting on AIDS in 1984, which was widely credited with catalyzing a consensus that AIDS was caused by a retrovirus now known as the Human Immunodeficiency Virus.

1990: Under the chairmanship of Dr. Pedro Cuatracasas (then President of the Parke Davis Research Laboratories) followed by Professor Ralph Bradshaw (then at the University of California, Irvine), Keystone Symposia relocated to Silverthorne, Colorado, became a division of The Keystone Center and was renamed Keystone Symposia on Molecular and Cellular Biology.

1995: Under the Board leadership of Professor Dennis Cunningham of the University of California, Irvine, Keystone Symposia began a phased transition to separate from The Keystone Center.

1997: Under the chairmanship of Professor Edward A. Dennis of the University of California, San Diego, this separation was completed and Keystone Symposia became a completely independent nonprofit 501(c)(3) organization.

(continued on next page)

2001: We held our first conference outside of the US in Canada ("Hematopoiesis" in Whistler, British Columbia, Canada) and also launched our formal diversity initiatives, supported first by a grant from the David and Lucile Packard Foundation and later by another from the Alfred P. Sloan Foundation.

2003: Dr. James W. Aiken assumed the new position of Chief Executive Officer.

2005: Keystone Symposia's first conference in Asia convened ("Stem Cells, Senescence and Cancer" in Singapore).

2006: We held our first conference in Europe ("Multi-Protein Complexes Involved in Cell Regulation" in Cambridge, UK) and also launched the Keystone Symposia Global Health Series, supported by the Bill & Melinda Gates Foundation, which also funds Global Health Travel Awards to enable developing-country investigators to attend meetings in this Series.

2007: Keystone Symposia's first conference in Africa and the first Global Health Series meeting convened ("Challenges of Global Vaccine Development" in Cape Town, South Africa).

2009: We organized our first conference in Australia ("Telomere Biology and DNA Repair" in Ashmore).

2010: Keystone Symposia received a five-year, US$1.37 million MARC (Minority Access to Research Careers) grant from the National Institute of General Medical Sciences of the US National Institutes of Health to help fund expanding diversity initiatives.

2013: Keystone Symposia convened its first conference in South America ("The Innate Immune Response in the Pathogenesis of Infectious Disease" in Ouro Preto, Brazil).

2014: Keystone Symposia appointed a new President and Chief Executive Officer, Dr. Jane L. Peterson, upon the retirement of Dr. James W. Aiken. Dr. Peterson took up the position effective April 14, 2014.


Dr. Jane Peterson

The SAB also reviews the entire meeting portfolio to determine whether any additional meetings need to be "fast-tracked" to fill gaps in the portfolio. While the key focus of the SAB is the quality of the scientific content, considerable attention is paid to speaker diversity in the programs, including gender, stage of career, ethnicity, affiliation, geographical distribution and speaker return rate. In addition, efforts are made to ensure appropriate representation of basic, clinical and industry research in the programs, depending on the scientific topic. Organizers submit revised meeting programs by September and October, allowing Keystone Symposia staff to start inviting speakers well over a year in advance of the conference season.

To ensure the best-quality science unencumbered by commercial interests, Keystone Symposia does not accept any requests to speak on the programs. Similarly, corporate sponsors do not receive speaking slots and are not given preference when organizers invite speakers. Even in cases where nonprofit foundations and publishers sponsor sessions or speakers, the organizers always select the associated speakers and topics.

Like the SAB members and study group programming consultants, scientific organizers serve in an entirely volunteer capacity with only their economy-rate travel, lodging and registration expenses paid. Organizers fine-tune their programs and select speakers, using guidelines from Keystone Symposia to encourage fresh and diverse participation. A number of slots in each session are left open for late-breaking developments to be later filled by short talks that the organizers select from submitted abstracts.

Keystone Symposia chooses conference venues that are able to accommodate the expected number of participants, provide cost-effective facilities and offer an atmosphere conducive to information exchange and informal networking. Keystone Symposia staff negotiate discounted lodging rates, and every attempt is made to select sites that are environmentally conscientious.

Keystone Symposia Diversity Initiatives

Keystone Symposia strives to engage conference attendees with many different experiences and backgrounds – e.g., different research interests and work environments, career stages and cultures. Diverse experiences and backgrounds provide the lens through which we discern and conceive of research questions. By including a rich variety of perspectives, we ensure that the best research questions and problem-solving approaches are represented at the conferences.

We are dedicated to increasing the number of scientists from designated underrepresented backgrounds and female scientists as organizers, speakers and attendees. Scholarships and highly interactive poster sessions encourage the participation of students and postdoctoral fellows, who typically account for 40% of attendees each year. The Keystone Symposia Global Health Travel

(continued on next page)

Keystone Symposia on Molecular and Cellular Biology

Awards make possible the participation of investigators from developing countries in meetings of the Keystone Symposia Global Health Series.

Through a range of initiatives in diversity, we actively promote participation of UR (underrepresented) investigators. Overseen by our Director of Diversity in Life Science Programs, (DLSP) with input from scientists, and science policy makers, on the Diversity Advisory Committee, these initiatives include:

Scholarships – We encourage UR trainees to apply for scholarships which provide $1,200 for graduate students and postdoctoral fellows to attend a Keystone Symposia conference. Submission of an abstract is required and selection is based on the quality of the abstract. Visit **www.keystonesymposia.org/scholarships**.

ABRCMS Scholarships – Each year during the Annual Biomedical Research Conference for Minority Students (ABRCMS), managed by the American Society for Microbiology, Keystone Symposia awards scholarships to two students at the graduate and/or postdoctoral research level who are presenting research or mentoring early career UR trainees at the conference. Visit **www.keystonesymposia.org/ABRCMS**.

Early-Career Investigator Travel Awards – We award up to $1,200 for UR scientists who are assistant professors or industry scientists at equivalent levels with US citizenship or permanent residency to attend a Keystone Symposia meeting. The application requires the candidate to identify a specific question he/she is researching which might be addressed by attending a particular meeting. It also requires a commitment to mentoring a student (undergraduate, graduate, postdoc) from an underrepresented background in a laboratory around career development and positioning issues for a minimum of one year. These competitive Awards are made possible by Biogen and Burroughs Wellcome Fund. Applications are reviewed and ranked by meeting organizers. Visit **www.keystonesymposia.org/EarlyCareerAward**.

Keystone Symposia Fellows Program – Keystone Symposia accepts on average ten early-career UR scientists annually who are committed to a research career and to enhancing diversity in the life sciences by increasing participation of designated UR scientist populations. The Keystone Symposia Fellows Program provides an opportunity to engage in the Keystone Symposia program development process and gain insight into the inner workings of the life science community. Fellows interact at the highest levels with renowned scientists, engaging via teleconferences and face-to-face participation in the meetings of our Scientific Advisory Board and onsite Fellows Circle at the June SAB meeting. Visit **www.keystonesymposia.org/Fellows** to learn more, apply or read about past and current Fellows. The application deadline for the 2018 Fellows Program is **March 15, 2017.**

Peer-to-Peer Program – Participants from UR backgrounds are emailed information on the DLSP prior to their attendance at a Keystone Symposia conference. The DLSP director also provides first-time UR attendees with a link to a Google Hangout conducted by Fellows on "What to Expect at a Keystone Symposia conference." If Keystone Symposia Fellow(s) are in attendance the Fellow(s) serve as DLSP ambassadors to UR first-time attendees and their names and contact information are sent in advance of the conference to establish communication. This provides an opportunity to share research backgrounds and have names and faces to connect with throughout the conference. Attendees who have self-identified as being members of a federally designated UR population will be sent these advanced email notifications.

Biogen Mentoring Program – Keystone Symposia collaborates with Biogen in offering formal mentoring sessions to scientists from UR backgrounds at selected Keystone Symposia meetings. These sessions are facilitated by scientists from Biogen.

Strategic and Deliberate Outreach – Keystone Symposia's DLSP Director presents information and attends national diversity conferences such as ABRCMS, Understanding Interventions, The Leadership Alliance National Symposium (LANS), SACNAS (Society for the Advancement of Chicanos and Native Americans in Science) Annual Conference, and other molecular and cellular biology conferences for diversity trainees at universities and medical schools nationwide. Ongoing collaborations to promote early-career investigator development and diversity enhancement include work with Brown University, Harvard Medical School, The Leadership Alliance, The Endocrine Society, Biogen, Novartis Institutes for BioMedical Research, the Society for Neuroscience (SfN), and the National Institutes of Health (NIH) National Research Mentoring Network (NRMN).

*For more information on Keystone Symposia's Diversity in Life Science Programs, please visit **www.keystonesymposia.org/diversity**.*

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*If you are interested in supporting these Programs, please contact Irelene Ricks, Director of Diversity in Life Science Programs, at **irelener@keystonesymposia.org.***

Thank you

To fulfill our nonprofit scientific mission, Keystone Symposia relies on significant financial commitment from government, foundation and industry donors as well as generous support from individuals. Gifts to the discretionary Directors' Fund ensure Keystone Symposia's ability to provide sufficient program support for meetings on a greater variety of scientific topics than would be possible if gifts were restricted to specific meetings in each case. All contributions are vital to the fulfillment of our mission — catalyzing collaborations to accelerate discoveries and helping to prepare and position the next generation of leading life scientists.

To all of our faithful supporters:
Thank you for your generous commitment to Keystone Symposia.

If your organization is interested in making a donation to Keystone Symposia, please contact our Development Office at ***development@keystonesymposia.org****. You can also visit* ***keystonesymposia.org/corporategiving*** *for more information.*

If you are interested in making a personal donation to the Future of Science Fund, please visit our secure individual donor platform at ***keystonesymposia.org/FSF****.*

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Donors of $50,000 or above. We are very grateful for this extraordinary commitment to our mission to connect the scientific community and accelerate discoveries that benefit the world community. Special thanks to these organizations for consistent, annual Benefactor-level support.

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Donor Acknowledgement

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Support for Keystone Symposia Diversity in Life Science Programs

We are grateful for this valuable support directed at increasing the participation of underrepresented scientists among meeting leaders and attendees, thereby enhancing diversity in the life science research community. Read more about our Diversity in Life Science programs on page 19.

Biogen
Burroughs Wellcome Fund
The Endocrine Society

US Federal Grant Funding

Keystone Symposia truly appreciates the support received from various institutes of the National Institutes of Health. This support primarily funds scholarships for graduate students and postdoctoral fellows to attend our conferences. US federal grant support for the 2016–2017 meeting series was generously provided by:

National Cancer Institute (NCI)
National Center for Advancing Translational Sciences (NCATS)
National Heart, Lung and Blood Institute (NHLBI)
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Alonso

This abstract was not available at the time of printing.

Abdulla

Towards Tackling Asymptomatics in Africa

Salim Abdulla
Ifakara Health Institute, Tanzania and Marcel Tanner Swiss Tropical and Public Health Institute, Switzerland

Malaria transmission is maintained by a large pool of mainly asymptomatic parasite carriers that can infect mosquito vectors who spread the disease. The interaction between infecting parasite adaptive mechanisms, human host responses, disease manifestations and cure and preventive interventions produce the different patterns of carrier states in different populations.

Several attempts have been made to tackle the problem of asymptomatic carrier of the malaria parasite during efforts reduce the burden of malaria and interrupt transmission in Africa. The interventions deployed included early diagnosis and treatment approaches that improved coverage of testing of populations, preventive approaches with vector control using insecticides (bed nets and indoor residual spraying) and several approaches of using antimalarial drugs including mass drug administration. So far most of these attempts have no managed to interrupt transmission in areas where malaria is highly endemic.

Newer tools are under development including more effective insecticides, highly effective drugs that can provide longer prophylactic effects and second generation malaria vaccines that expected to have higher efficacy. Deployment of these may offer opportunity of better results.

Apart from the interventions, the health system context of the initiatives and the lessons learnt from these attempts in Africa, will be discussed.

Drakeley

Malaria Transmission: Characterizing and Emptying the Reservoir

Chris Drakeley[1*] and Teun Bousema[1,2]
[1]Department of Immunology & Infection, London School of Hygiene & Tropical Medicine, London, UK; [2]Department of Medical Microbiology, Radboud University Medical Center, Nijmegen, The Netherlands

In the last decade there have been a large number of studies which describe a proportionally high presence of low parasite density malaria infections in populations resident in malaria endemic areas. These low density infections are beneath the limit of detection of commonly used diagnostics (microscopy and rapid diagnostic tests) and are typically asymptomatic meaning that they will not be identified or treated. In areas with low transmission levels these infections have described in all age groups of the population. The limited data that exist suggest these infections can be transmitted to mosquitoes but in low numbers. A key question for control programmes is whether these low density infections need to be specifically targeted to improve the likelihood and speed with which malaria elimination can be achieved.

This talk will present our current state of understanding on the extent and distribution of low density infections in different endemic settings. It will describe how these infections contribute the infectious reservoir of transmission and to what extent they might maintain transmission. Finally, the different potential approaches to target these low density infections will be discussed.

Prachumsri

Transmission Stages in *Plasmodium vivax*

Kirakorn Kiattibutr [a], Wanlapa Roobsoong [a], Patchara Sriwichai [b], Teerawat Saeseu [a], Nattawan Rachaphaew [a], Chayanut Suansomjit [c], Sureemas Buates [c], Thomas Obadia [d], Ivo Mueller [e], Liwang Cui [f], Wang Nguitragool [g], Jetsumon Sattabongkot [a]
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Plasmodium vivax is now the predominant species causing malarial infection and disease in most non-African areas, but little is known about its transmission efficiency from human to mosquitoes. Because the majority of Plasmodium infections in endemic areas are low density and asymptomatic, it is important to evaluate how well these infections transmit. Using membrane feeding apparatus, we fed *Anopheles dirus* with blood samples from 94 individuals who had natural *P. vivax* infection with parasitemias spanning four orders of magnitude. We found that the mosquito infection rate is positively correlated with blood parasitemia and that infection begins to rise when parasitemia is >10 parasites/µl. Below this threshold, mosquito infection is rare and associated with very few oocysts. Natural acquired immunity has been explored in the population. We also found that *P. vivax* is able to be transmitted in other Anopheles (suspected vectors), besides *An. dirus*, in these areas although infection rate found to be varied. These findings provide useful information for a) assessing the human reservoir of transmission, b) establishing diagnostic sensitivity required to identify individuals who are most infective to mosquitoes and c) evaluation of transmission blocking vaccine in areas with multiple species of vectors.

Funding: Bill & Melinda Gates Foundation, USA, National Institutes of Health, USA, Research Council of Australia Senior Research Fellowship and UK Wellcome Trust Intermediate Fellowship in Public Health and Tropical Medicine.

Slater

Modelling Malaria Elimination Strategies in Zambia

Hannah Slater[1], Patrick Walker[1], Peter Winskill[1], Busiku Hamainza[2], Ruben Conner[3], Kammerle Schneider[3], John Miller[3], Thom Eisele[3], Rick Steketee[3], Duncan Earle[3], Neil Ferguson[1], Azra Ghani[1]
[1]MRC Centre for Outbreak Analysis and Modelling, Imperial College London; [2]National Malaria Elimination Center, Lusaka, Zambia; [3]MACEPA, PATH, Seattle

Zambia have set an ambitious target of achieving malaria elimination by 2020. To reach this goal, the National Malaria Elimination Center have stratified the country into different zones based on current transmission, with different packages of interventions targeted in different areas. In this study we use an individual based mathematical model of malaria transmission with a human and mosquito movement structure to predict the potential impact of this strategy. In particular, we focus on the different resources needed to reduce burden and achieve elimination in the lower prevalence provinces in the south compared to higher prevalence provinces in the north.

Mass Drug Administration (MDA) has been suggested as an 'accelerator' for achieving elimination – a rapid clearance of the parasite reservoir followed by high case management and reactive follow-up of cases to maintain the gains of the MDA. We predict that in high prevalence areas this strategy will only provide a transient reduction in malaria burden, and a strong focus on maximising vector control coverage might be a more cost-effective intervention. However, in low prevalence areas, indeed MDA could act as an accelerator to sustained elimination, dependent on the underlying transmission potential of the area, the capacity of community health workers to respond to cases, and the level of importation of infected individuals to the area.

Working closely with in-country partners (MACEPA) and the National Malaria Elimination Center we have developed a productive collaboration where modelling scenarios considered are based on national strategy, and modelling outputs are evaluated and disseminated to partners in useful, timely and relevant way.

Karl

Ability of Different Markers of Exposure to Detect Residual "Pockets" of Transmission

Stephan Karl[1,2,3], Rhea J. Longley[1,2], Camila T. França[1,2], Wang Nguitragool[4], Andrea Kuehn[5], Andreea Waltman[1,2], Yi Wan Quah[1,2], Cristian Koepfli[1,2], Wuelton Marcelo[5], Pratap Singhasivanon[6], Takafumi Tsuboi[7], Jetsumon Sattabongkot[8], Marcus Lacerda[5] and Ivo Mueller[1,2,9]
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As national malaria-control programs are intensifying and moving towards the goal of elimination, better surveillance systems that can rapidly identify areas with residual malaria transmission are urgently required. This is particularly true for *Plasmodium vivax* which is more often asymptomatic and more resilient to elimination due to its ability to form hypnozoites.

Measuring the incidence of newly acquired malaria infections in an individual or a population requires intensive, active longitudinal cohort-based surveillance as the majority of infections are asymptomatic. In addition, since malaria blood stage infections can persist for extended periods of time, genetic analysis of samples is required to distinguish newly acquired infections from persisting ones. We have developed sampling strategies, and molecular and mathematical tools to determine the incidence of new blood stage infections and coined the term 'molecular force of blood stage infection' (molFOB). There are a variety of markers for malaria transmission and exposure that are collected much more easily and at considerably lower cost, and that can be used to approximate molFOB. These include incidence of clinical disease using passive (e.g., health centre-based) surveillance, infection prevalence (e.g., as determined in cross sectional studies), multiplicity of infection and serological markers of exposure. The aim of the this analysis was to determine in how far different measures of malaria transmission and exposure are able to predict the incidence of new blood stage infections (molFOB), which is the most accurate measure of transmission intensity [1]. We utilize data generated from a set of longitudinal cohort studies in Thailand, Brazil, Solomon Islands and Papua New Guinea. We show strong association between 'classical' markers of infection such as prevalence and clinical incidence with molFOB overall and in spatially discrete analyses. In addition, we show the capability of a panel of newly developed antibodies against *P.vivax* to accurately predict molFOB in various transmission scenarios.

1. Mueller, I., et al., *Force of infection is key to understanding the epidemiology of Plasmodium falciparum malaria in Papua New Guinean children. Proc Natl Acad Sci USA*, 2012. 109(25): p. 10030-5.

Silumbe

This abstract was not available at the time of printing.

Guinovart

Different Drug Administration Strategies and Reactive Case Investigation in Sub Saharan Africa

John Miller, Thomas Eisele, Caterina Guinovart, Kafula Silumbe, Michael Hainsworth, Ruben Conner, Yakou Dieye, Asnakew Yeshiwondim, Belendia Serda, Philippe Guinot, Asefaw Getachew, Jeff Bernson, Duncan Earle, Richard Steketee
MACEPA at PATH, Seattle, WA, USA; Tulane University, New Orleans, LA, USA; ISGlobal/PATH collaboration, Barcelona, Spain

Population-wide drug-based strategies are promising malaria elimination tools, although many questions still remain about their role in different transmission settings. Evidence from Zambia, Senegal and Ethiopia on the impact, operational feasibility and cost of population-wide or mass drug administration (MDA), mass test and treat (MTAT), and positive-household or focal mass drug administration (fMDA) will be presented. These strategies were operationally achievable, with high levels of population coverage, across a range of epidemiologic, geographic and health system settings. MDA is a promising strategy for accelerating toward malaria elimination in certain transmission settings likely due to the combined parasite clearance and prophylaxis, whereas the impact of MTAT is limited but might improve with a highly sensitive diagnostic test. Population-wide drug-based strategies should be used in a time-limited fashion and in combination with high coverage of vector control and case management, being thus part of a comprehensive malaria elimination strategy that accounts for local variations in malaria transmission intensity. Surveillance systems and reactive case investigation also must be in place for tracking and investigating passively-detected malaria cases to rapidly clear the few remaining or new infections and ensure that the gains from population-wide drug-based strategies can be maintained, documented and built upon.

Penny

Optimizing New Malaria Interventions and Intervention Mixes for Different Settings

Melissa A. Penny
Swiss Tropical and Public Health Institute and University of Basel, Switzerland

Following years of investment in strategies to control malaria, elimination is becoming tangible. But optimal delivery strategies and profiles of new interventions for elimination differ from those of disease control. This is because disease and immunity dynamics change as elimination is approached. Individual-level variations in responses to therapeutics, variations between parasites in ability to evade interventions, and the alignment of the profiles of new drugs and vaccines with the delivery capacity of health systems, all become more important. Ignoring these factors and their influence on the drop off from efficacy in trials to the effectiveness of interventions in real life will result in, at best, the roll out of inefficient tools, and, at worst, wasted investment and failure to achieve elimination. Mathematical modelling is gaining prominence and a greater role in optimising intervention packages that achieve certain health goals for particular geographic settings. Modelling provides understanding of how interventions interact together to reduce malaria incidence and transmission in very different epidemiological settings without testing the exhaustive combinations of interventions in the field. Modelling also informs clinical development of drugs and vaccines, however, models to date have generally been used at very specific stages, rather than in generating evidence for decision-making along the whole pathway from clinical, through to population and health systems contexts. In this presentation we present strategic approaches to use mathematical models to identify key determinants of intervention impact at individual and population level. Identification of these key determinants will aid decision making and allow more efficient resource allocation in the development of new malaria vaccines and drugs for elimination and resistance mitigation. Combining these approaches with data from early clinical trials, populations, epidemiological and health settings, it is possible to usefully predict the impact of new interventions, but also the optimal profile and mix of interventions required to achieve elimination.

Funding: Bill & Melinda Gates Foundation

Masanja

Understanding Access and Delivery – Responding to Efficacy Decay

Irene Masanja
Ifakara Health Institute, Dar es Salaam, Tanzania

Many health programmes in developing world records sub-optimal performance due to barriers faced when implementing the intended work. Despite advancements in medicine, local health systems continue to face considerable challenges to deliver health care to the users. The benefits of highly efficacious treatments, are not met at the end of the delivery chain. This efficacy decay reiterates the complexities faced by health systems in delivery of care and how access to appropriate care is a diverse phenomenon, evolving with time, place and target population.

This talk will present different approaches used to improve access to care, what delivery options have been tried in health care sector for the past decade, and how these approaches have responded to efficacy decay of malaria treatment in sub-Saharan Africa.

Towards malaria eradication, a need to optimize delivery of interventions to target population must be emphasized.

Roberts

Surveillance as an Intervention: Geo-Spatial Approaches to Identify and Target Malaria Transmission

Kathryn W. Roberts
Global Health Group at the University of California, San Francisco, CA, USA

As countries transition from control to elimination, surveillance systems have the potential to become a critical part of the malaria response as reporting shifts from periodic and aggregated real-time on individually geo-located cases.

In Zambezi region Namibia, case forms previously remained at health facilities (HFs) once completed, without entry into databases to permit finer scale analyses of case clustering. To address these challenges a rapid reporting system was developed for western Zambezi (pop.~35381) and linked to a geographical reconnaissance (GR) of 8,026 households conducted in 2014-15. The GR mapped and collected baseline data on households and included a QR code affixed to each doorframe and resident's health passport. The rapid reporting system involves HF entry of minimum essential data on confirmed cases via tablet, sent by 3G network to a secure cloud database.

A spatial decision support system (SDSS) incorporating a geographical information system (GIS)-based framework integrating a surveillance database, graphical maps, and expert knowledge, was developed. The SDSS includes GR household data, retrospective 2011-15 incidence data from HF registries (including 3152 rapid diagnostic test-confirmed cases from 2013-15), and ongoing incidence data collected (2015-2016) from the rapid reporting system. The SDSS enables users to plot cases to the household level within 24 hours of case detection, to track neighboring households during ongoing case investigations, and to generate transmission risk maps for the 2015/16 malaria season. The Zambezi region SDSS has 3 roles: (i) to support Ministry of Health and Social Service (MoHSS) targeting of human and financial resources towards most at-risk areas; (ii) to support the implementation of a randomized controlled study exploring innovative case response strategies; and (iii) to coordinate the region's MoHSS and research activities. This represents one of the first published reports of an SDSS being used to help a country move towards elimination through surveillance, support research, and contribute to making that research more accessible and acceptable to local actors. By integrating surveillance activities with interventions at different stages of the response process, knowledge about the epidemiology of the disease and case response process can continue to improve and adapt as the country moves towards malaria elimination.

Buj

Innovations in Malaria Service Delivery to Accelerate Progress towards Malaria Elimination

Valentina Buj
UNICEF, New York, NY, USA

Reaching the global malaria elimination targets will require innovations not only in the technology but also in service delivery. In particular reduction of the malaria reservoir will require reaching into oft-overlooked areas: e.g. peri-urban slums, school-age children and the usual difficult to reach populations: the most poor, migrants, internally displaced, refugees, etc which will need an integrated approach. Some of the innovative delivery mechanisms which can be leveraged to accelerate progress towards malaria elimination - in addition to ensuring comprehensive care of the febrile child, mass screen and treat, and enhanced ante-natal care which will be needed to find sub-clinical reservoirs - are devolution of information to district level, creative community participatory approaches, and systemic use of m-health technologies. This talk will focus on opportunities and examples – especially on integrated approaches – with the aim of provoking a dialogue and creative thinking.

Lacerda

This abstract was not available at the time of printing.

Chibale

Targeting the Plasmodia at Multiple Lifecycle Stages: A Chemotherapy Approach towards Malaria Eradication

Kelly Chibale
Drug Discovery and Development Centre (H3D), Department of Chemistry and Institute of Infectious Disease and Molecular Medicine, University of Cape Town, Rondebosch, South Africa

The elimination of malaria requires unique intervention strategies, which include the discovery and development of new medicines that offer protection, control and transmission blocking profiles.

A high-throughput screening campaign involving 36608 compounds from a BioFocus SoftFocus library initially identified a series of 2-aminopyridines as hits with >80% inhibition against 3D7 and Dd2 strains of the human malaria parasite *Plasmodium falciparum* at a concentration of 1.82 μM. Optimisation of the 2-aminopyridine series led to the delivery of the promising long acting clinical candidate and *Plasmodium* PI4K inhibitor MMV390048, which has the potential to impact malaria prophylaxis, control and eradication.

Having delivered MMV390048 as the first and only *Plasmodium* PI4K inhibitor to have progressed to Phase I human studies, the next drug discovery key goal was to identify suitable back-ups.

This presentation will describe the process that led to the identification of the next generation *Plasmodium* PI4K inhibitors that impact the entire malaria parasite life cycle.

Acknowledgements: Financial support of this research from the Medicines for Malaria Venture and South African Technology Innovation Agency is gratefully acknowledged.

Hoffman

Rationale and Plans for Using a PfSPZ-Based Vaccine in Malaria Parasite Elimination Campaigns

Stephen L. Hoffman
Sanaria Inc., for the International PfSPZ Consortium, Rockville, MD, USA

Bednets and insecticides that reduce human-mosquito contact and drugs that reduce the parasite reservoir in humans are making significant progress against *Plasmodium falciparum* (Pf). However, many have concluded these approaches will be inadequate to eliminate Pf in areas with intense transmission. We believe a vaccine that prevents Pf infection will tip the balance, and are developing Pf sporozoite (SPZ)-based vaccines to be integrated with existing control measures through mass vaccination programs (MVPs) to block infection, halt transmission, prevent re-infection, and eliminate Pf in defined areas. To achieve these goals, we will need to immunize ≥90% of the target population with a vaccine that prevents all Pf infections in ≥80% of recipients for ≥6 months. PfSPZ Vaccine (radiation attenuated PfSPZ) induced ≥80% short-term protection (3 weeks) against controlled human malaria infection (CHMI) with a homologous Pf in the U.S., Tanzania, and Mali (63/68 vaccinees protected = 92.6%) and long term (33 weeks) protection against CHMI with a heterologous Pf in the U.S (5/6 previously protected vaccinees protected). PfSPZ-CVac (non-attenuated PfSPZ administered with chemoprophylaxis) induced ≥80% medium term protection (10 weeks) against CHMI with homologous Pf in Germany and the U.S. (13/14 vaccinees fully protected = 92.9%), and immunization with PfSPZ-CVac can be completed in 10 days, but still requires regimen optimization for optimal efficacy. Clinical trials in 8 African countries, Germany, and the U.S. (>1500 volunteers) are intended to establish dosage and immunization regimens (# of PfSPZ, # of immunizations [1, 2, or 3], dose intervals [5 to 56 days]) to be taken to pivotal phase 3 trials in late 2017 and 2018, and then licensure and implementation. The trial designs, potential for combining a drug for MDA with PfSPZ to create a unique PfSPZ-CVac approach, and plans for large-scale MVPs in populations >250,000 individuals in Equatorial Guinea and western Kenya will be discussed.

Schofield

This abstract was not available at the time of printing.

Wondji

Complex Genomic Evolution of Insecticide Resistance in Malaria Vectors: A Challenge for Vector Control

Gareth D. Weedall[1], Jacob M. Riveron[1,2], Murielle J. Wondji[1,2], Helen Irving[1] and Charles S. Wondji[1,2]
[1]Liverpool School of Tropical Medicine, Liverpool, UK; [2]OCEAC, Organization de Coordination Pour la lutte Contre les Grandes Endemies en Africa Centrale, Yaoundé, Cameroon

Malaria control relies heavily on insecticide-based interventions such as bed nets or indoor residual spraying. However, increasing resistance to main insecticides in malaria vectors threatens the continued success of these tools. To design suitable insecticide resistance management (IRM) strategies to prolong the effectiveness of these tools, it is crucial to elucidate the genetic basis and patterns of evolution of resistance in mosquitoes. Recent studies have revealed a complex genomic evolution of resistance in malaria vectors across the continent likely to impact the design of IRM. Africa-wide surveys show that resistance including against pyrethroids, the only class recommended for bed nets, is spreading with increasing cases of multiple resistance and higher resistance intensity. Lab and field studies are showing that increased resistance is reducing the efficacy of control tools with PBO-based nets providing better efficacy. Significant contrast in the gene RNAseq expression profiles of resistant mosquitoes is observed between African regions suggesting differences in the molecular basis of resistance. For example in *Anopheles funestus*, the P450s CYP6P9a/b are dominant in southern Africa but not in other regions where other genes operate. This variation correlates with high genetic differentiation between regions and the distribution patterns of resistance markers suggesting that barriers to gene flow impact the spread of resistance. Whole genome sequencing detected several signatures of selective sweeps but these varied by regions as for gene expression. Fine-scale analysis of key resistance genomic regions reveals a complex evolution of resistance mechanisms with evidences of various copy number variations suggesting independent selective events across the continent. Analysis of pre and post-intervention samples reveals that selective sweep is directly caused by the scale up of control tools which are selecting alleles the most metabolically efficient in conferring resistance. The near fixation of such alleles in populations would limit options for IRM. These studies call for the design of tailored IRM strategies as it is not one size fits all.

Lucas

Meeting the Challenge of Insecticide Resistance

John Lucas
Sumitomo Chemical Company, London, UK

Tremendous advances against malaria have been made in the past 15 years. For example in sub-Saharan Africa more than half of the population is now sleeping under insecticide-treated mosquito nets, compared to just 2% in 2000. While deaths and cases have fallen by more than half in this period, malaria still caused the death of an estimated 438,000 people in 2015, and there are still over 200 million cases a year. A recent paper by Bhatt et al. has demonstrated the huge importance of vector control in reducing malaria transmission, with 68% of reductions in prevalence being due to the use of bed nets, while indoor residual spraying although less widely used still contributed to a 13% reduction. With widespread resistance reported to all current WHO recommended insecticides especially pyrethroids (currently the only insecticide recommended for use in bed nets) the situation is very worrying and alternatives are urgently needed – there has been no new mode of action adulticides for 40 years. Sumitomo Chemical is one of several companies committed to investment in the development of new insecticide products for the control of resistant malaria transmitting mosquitoes as well as products to deal with the global issue of emerging insect borne diseases such as Zika, and resistance in their vectors.

The many steps, challenges and hurdles that companies face developing and getting these products to market will be discussed.

Paaijmans

On Mosquitoes and Headless Chickens: Entomological Intelligence on the Road to Malaria Elimination

Krijn Paaijmans
Barcelona Institute for Global Health (ISGlobal), Barcelona, Spain

The goal of the Mozambican National Malaria Control Program (NMCP) and its partners is to reach malaria elimination in southern Mozambique by 2020. The Entomology Unit at the Manhiça Health Research Centre (CISM) assists the NMCP in the design and implementation of a strong entomological surveillance system. Without such surveillance, there will be no malaria elimination.

But what are the minimal essential data we (entomologists) have to collect? Who needs to collect them, where and when? And will our approach change with changing malaria intensity? Using data from our surveillance systems and operational research activities, which highlight the challenges and opportunities facing local vector control efforts, I will discuss the role of entomologists on the road to zero malaria.

Grant funding acknowledgement: Bill & Melinda Gates Foundation, Obra Social "la Caixa"

Dinglasan

From Discovery to Implementation: Interventions that Block Malaria Parasite Transmission at the Bite

Rhoel R. Dinglasan
Emerging Pathogens Institute, The University of Florida, Department of Infectious Diseases & Pathology, Gainesville, FL, USA

Mosquito-based malaria transmission-blocking vaccines (mTBVs) that target midgut-surface antigens of the *Plasmodium* parasite's obligate invertebrate vector, the *Anopheles* mosquito offer unique advantages over classical parasite-centric TBVs. A target product profile (TPP) for mTBVs includes the following parameters: (i) the midgut proteins act as direct or indirect receptors for *Plasmodium* ookinetes, (ii) must be intrinsically immunogenic in vertebrates, (iii) should be highly conserved across all anopheline species (i.e., Old and New World mosquitoes) at the amino acid level, and (iv) antibodies elicited against such targets results in *Plasmodium* species-transcending transmission-blocking activity in the mosquito vector. The alanyl aminopeptidase N (AnAPN1) is the leading mosquito-based universal malaria TBV immunogen that meets all of these TPP objectives. However, several gaps in our knowledge remain at both ends of the discovery to implementation pipeline, specifically the basic biology and operational use of the AnAPN1 mTBV. What is the role of AnAPN1 in *Plasmodium* infection of the mosquito vector, and how do anti-AnAPN1 antibodies functionally block parasite transmission? What is the risk of parasite break-through? Should this mTBV become available for implementation, how do we deploy such an intervention in a cost-effective, targeted manner? These issues and their potential solutions will be presented and discussed.

Funding: PATH-MVI, Bill & Melinda Gates Foundation, Bloomberg Foundation, NIAD/NIH, TEDCO Maryland Innovation Initiative, Global Health Innovative Technology Fund

Volkman

This abstract was not available at the time of printing.

Cortes Closas

Epigenetic Variation in Malaria Parasites: Sex, Drugs and... Adaptation

Alfred Cortés
ISGlobal and ICREA, Barcelona, Catalonia, Spain

As any other organism, malaria parasites need to adapt to changes in their environment in order to survive. Renewed malaria elimination efforts will determine a context in which accelerated parasite evolution can be expected as the parasites adapt to new challenges and selective pressures. Thus, understanding parasite adaptive strategies is of outmost importance to design appropriate monitoring schedules to accompany elimination activities. Recent data indicates that epigenetic variation plays an important role in the adaptation of *P. falciparum* populations to changes in their environment. I will present new results of our studies on the adaptation of parasites to presence of toxic compounds or to heat-shock mimicking malarial fever episodes. While the adaptation of parasite populations to some toxic compounds involves selection of parasites with specific transcriptional patterns of the clonally variant *clag3* genes (a bet-hedging adaptive strategy), adaptation to heat-shock appears to involve mainly mechanisms unrelated with epigenetic variation. Last, I will present the results of our new studies on the clonally variant gene *pfap2-g*, the master regulator of sexual conversion. Importantly, sexual conversion is necessary for malaria transmission, and variation in the rates of *pfap2-g* activation and subsequent sexual differentiation can play an adaptive role. We investigate the molecular mechanisms underlying variation in the rates of *pfap2-g* activation and we also use this gene to gain new insight into the process of sexual commitment.

This research is supported by MINECO (Spanish Government) grants SAF2013-43601-R and SAF2016-76190-R, co-funded by the ERDF (European Union), and grant 2014 SGR 485 (Catalan Government).

Djimdé

Significant Different Levels of Artemisinin Monotherapy Efficacy on *P. falciparum* in Mali

Sissoko S., Fofana B., Sangare C.P.O., Toure S., Sanogo K., Diakite H., Toure S.H., Dembele D., Sangare B., Haidara K., Doumbia D., Kone A., Doumbo O. K. and Djimde A.A.
MRTC – DEAP – FAPH - University of Sciences, Techniques and Technology of Bamako, Mali

Resistance to artemisinin derivatives is associated with delayed parasite clearance. In the context of regular monitoring of artemisinin resistance we conducted prospective artesunate monotherapy efficacy studies in two sites of Mali.

From October 2015 to March 2016, we measured the efficacy of artesunate monotherapy in subjects aged 6 months and longer- Bougoula Hameau and Faladje. Patients with uncomplicated malaria were treated with artesunate for 7 days and followed for 28 days. Parasitaemia was evaluated every 8 hours until three consecutive slides were negatives. Parasite polymorphisms was assessed by PCR to distinguish new infections from recrudescent infections. Parasite clearance time (PCT) and parasite clearance half-life were calculated using the online WWARN parasite clearance estimator software (PCE).

Results were compared with the studies conducted in Bougoula-Hameau in 2011.

We included 100 patients in Bougoula-Hameau and 120 others in Faladje. Adequate Clinical and parasitological response (ACPR) was 92.0% and 79.2% in Bougoula-Hameau and Faladje, respectively. Corrected cACPRs was 100% at both sites. By 24 hours after treatment initiation, 28% of participants had cleared parasitemia in Bougoula-Hameau, compared with 2.5% in Faladje (P<0.0001). The median PCT was 32 hours in Bougoula-Hameau (similar to the Bougoula-Hameau 2011 results) but 40 hours in Faladje (P<0.001). The parasite clearance half-life was 2.0 hours (1.66 to 2.23) in Bougoula-Hameau and 2.8 hours (2.39 to 2.99) in Faladje ($p < 0.001$). Only one non-synonymous PfK13 mutation was found at codon 578 in Bougoula- Hameau.

Artesunate monotherapy remains effective on *P. falciparum* in Mali but there are significant differences in the level of susceptibility of parasites from different settings of the country.

Menard

Artemisinin and Drug Partner Resistance: From Phenotype to Genotype

Didier Menard
Institut Pasteur/Institut Pasteur, Phnom Penh, Cambodia

Across the globe, over 200 million annual malaria infections result in up to 660,000 deaths. Malaria deaths are prevented by using effective antimalarial drugs. Artemisinin derivatives are one of the few remaining compound classes that can be used to cure multidrug-resistant *Plasmodium falciparum* infections.

Unfortunately, last reports from Southeast Asia are showing that artemisinin combined therapies (ACTs) are losing their efficacy, adding renewed urgency to the search for the genetic determinants of parasite resistance.

In our talk, we will present approach that have led to an improved understanding of artemisinin resistance and the identification of resistance-conferring mutations in the *P. falciparum K13* gene along with that currently being used to identify molecular markers of partner drug resistance (piperaquine), as an example of effective and successful collaborative works conducted both at IP Cambodia and IP Paris.

Funding: Institut Pasteur in Cambodia, Institut Pasteur Paris

Kamya

Impact of Malaria Control Interventions in Uganda

[1,2]Moses Kamya, [2]Emmanuel Arinaitwe, [2]John Rek, [2]Ruth Kigozi, [1,2]Adoke Yeka, [2]Maxwell Kilama, [2]Mary Muhindo, [1,2]Arthur Mpimbaza, [1,2]Joaniter Nankabirwa, [2]Henry Mawejje, [3]Bryan Greenhouse, [4]Sarah Staedke, [3]Philip Rosenthal, [3]Grant Dorsey
[1]Makerere University College of Health Sciences, Kampala, Uganda; [2] Infectious Diseases Research Collaboration, Kampala, Uganda; [3]University of California, San Francisco, CA, USA, [4]London School of Hygiene and Tropical Medicine, UK

The intensification of malaria control interventions, including long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS) of insecticides, and prompt treatment with artemisinin-based combination therapies (ACTs) has been accompanied by marked reductions in transmission intensity and in malaria morbidity and mortality in some settings. The Makerere University-UCSF Research Collaboration and the Infectious Diseases Research Collaboration in Uganda have conducted comprehensive surveillance studies at 3 sites and studies of prevention of malaria during pregnancy at one of these sites. We have evaluated: 1) the impact of LLINs and IRS on key malaria indicators; 2) insecticide resistance; 3) sub-patent parasitemia and infectious reservoir; 4) impact of prompt effective treatment with ACTs and; 5) impact of IRS on birth outcomes. We found that LLINs were less effective than expected and the high pyrethroid resistance is likely a contributing factor. IRS was highly effective in high transmission settings but discontinuation of the intervention was associated with resurgence. The high infectious reservoir with sub-patent parasitemia may be driving the upsurge following IRS withdrawal. Access to prompt treatment with ACTs was highly effective and associated with a very low risk of severe malaria. The provision of IRS was associated with improved birth outcomes. Uganda has made great strides in reducing the burden of malaria but faces substantial challenges on the road to elimination.

Funding: US NIH International Centers of Excellence in Malaria Research (ICEMR) program (U19AI089674) and US President's Malaria Initiative (PMI)

Noor

Malaria Surveillance as Intervention along the Pathway to Elimination

Abdisalan M. Noor
Global Malaria Programme, World Health Organization, Geneva, Switzerland

The WHO Global Technical Strategy (GTS) 2016-2030 for malaria has established disease surveillance as one of three core pillars and, for the first time, recommends it as an intervention across all malaria endemic settings, not only in those that are in the elimination phase. This recognizes the urgent need for reliable health information for effective decision-making and better targeting of limited resources to improve impact, sustain recent impressive gains and preserve malaria interventions from the spread of resistance. Here, a review of the current status of surveillance systems in malaria endemic countries is presented. A conceptual framework of surveillance as an intervention, including an approach to costing surveillance needs, is described. This framework explores the complex problem of costing improvements of surveillance systems in countries with moderate to high transmission and where information systems are inevitably integrated. A roadmap is developed for the strengthening of surveillance systems in malaria endemic countries, especially in those that carry the highest burden but have the weakest systems and those that are close to elimination but require transition of systems.

Tanner

Global Travel, Migration, Impact and Risks of Malaria Re-Introduction

Marcel Tanner
Swiss Tropical and Public Health Institute, University of Basel and Swiss Academy of Sciences, Basel, Switzerland

As globalization increases, interdependence between the physical and social environment reaches higher dynamics and complexity and calls for an integrated ecological and social perspective to understand the determinants for health and well-being at micro/local to macro/global levels.

The global health challenges have become more complex owing to the increased population dynamics that basically affect all ecosystems. Consequently, the demographic and subsequent epidemiological transitions forge unprecedented paths in the different social, ecological, cultural and economic settings. Tackling global health challenges and aiming at malaria elimination and ultimately eradication imply that our planning for elimination and the translation in different settings are reconciled within socio-ecological settings and health systems, such as:

- People and household-centered approaches to ensure equity and access;
- Systems thinking that focusses on equitable systems effectiveness including effective governance and financing through decentralization and well-defined partnerships;
- Continuous monitoring through minimal essential surveillance—response approaches;
- Human resources management that includes training and continuing education, and
- Accompanying, relevant research and development activities.

These key determinants for malaria elimination/eradication will be illustrated and discussed based on the conclusions of the present conference, recent case studies and all progress made so far. It concludes with the perspective that sustainability of our efforts and achieving the ambitious goal will only be achieved if we: (i) consider the inextricable linkages between ecosystems, society and health; (ii) understand that contemporary complex global health problems cannot be solved by "reductionist" approaches; and (iii) finally, this requires ecological, health, social and political systems thinking and taking action. The way forward lies in the combination of ecosystem and public health approaches, within in the spirit of the Global Technical Strategy (GTS) for Malaria and the framework for Action and Investment to defeat Malaria complemented by a sound Research & Development agenda and within the context of our pursuit of the Sustainable Development Goals.

Poster Session 1

Monday, February 20 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Accrombessi, Manfred	1001	Effects of malaria in the first trimester of pregnancy on the poor birth outcomes, a pre-conceptional study in Benin
Afonne, Chinenye	1002	Malaria prevention practices and asymptomatic malaria in a rural community in Southwest Nigeria
Agbo, Chinazom	1034	Formulation, *in vitro* and anti-malarial pharmacodynamic investigations of Artemether and Lumefantrine Solid Lipid Microparticles based on Solid Reverse Micellar Solutions
Agwang, Constance	1035	Age-dependent carriage of alleles and haplotypes of *Plasmodium falciparum sera5, eba-175*, and *csp* in a region of intense malaria transmission in Uganda
Ahadji-Dabla, Koffi Mensah	1003	Susceptibility of a malaria vector *Anopheles gambiae s.l.* (Diptera: Culicidae) to WHO recommended insecticides, and Kdr and Ace.1^{R} mutations in Togo (West Africa)
Akinbo, Olalekan	1004	Regulating Gene Drives: Are African regulators up to the task?
Alozieuwa, Uchenna	1043	Evaluation of antiplasmodial activity of aqueous methanolic extracts and fractions of selected Nigerian plants
Amoah, Linda	1036	Characterization of novel gametocyte specific antigens predicted to be on the surface of gametocyte infected erythrocytes
Anderson, Chad	1005	Could a song about malaria prevention help protect children under 5 in venda rural communities?
Anyanwu, Philip	1006	Exploring the role of socioeconomic factors in the development and spread of antimalarial drug resistance: a qualitative study
Arnaldo, Paulo	1007	Prevalence and Risk factors for *P. falciparum* malaria in pregnancy and Effects on Birth Outcomes in Chókwè District, Mozambique
Arrey Tarkang, Protus	1037	Synergistic constituent plant extracts of Nefang improve malaria therapeutic selectivity
Asad, Mohd	1008	Identification of inhibitors targeting *Plasmodium falciparum* ClpQ protease
Atim, Julian	1009	Maintaining high net use during IRS implementation: The case of Tororo district, Eastern Uganda
Awandu, Shehu	1010	Towards malaria elimination;host genetic factors influencing potential primaquine use in Vhembe District, Limpopo Province, South Africa
Bakare, Emmanuel	1011	A population-level mathematical modeling approach towards malaria elimination in Lagos State, Nigeria
Baraka, Vito	1012	Limited impact of treatment and re-treatment with artemether-lumefantrine and artesunate-amodiaquine on the selection of *Plasmodium falciparum* multidrug resistance-1 alleles
Barasa, Sheila	1013	A Low Technology Emanator Treated with the Volatile Pyrethroid Transfluthrin Confers Long term Protection against Outdoor biting Vectors of Lymphatic Filariasis, Arboviruses and Malaria
Barry, Alyssa	1014	Transmission dynamics of *Plasmodium falciparum* and *Plasmodium vivax* in the South West Pacific
Bello, Ibrahim	1015	Reliability of RDTs for Malaria among Pregnant Women at booking in Igogo Ekiti Rural Health Centre of Federal Teaching Hospital, Ido-Ekiti, Ekiti State, South Western Nigeria
Birungi, Krystal	1016	Population dynamics-species composition, abundance and diversity of *Anopheles* malaria vectors at Kiimi and Nsadzi islands in Uganda

Monday, February 20 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Botchway, Felix	1017	CXCL10 Gene Promoter Polymorphism -1447A>G Correlates with Plasma CXCL10 Levels and is Associated Susceptibility to Malaria in Ghanaian Children
Builders, Modupe	1018	In Search of a Potent Antimalarial Agent: Antiplasmodial Assessment of Three Herbs with Folkloric Antimalarial Claims
Chebon, Grace	1019	Regional Burden of Malaria in Patients Presenting with Febrile Illness in Kenya
Chebon, Lorna	1020	Mutation analysis of K13 full gene, *Pfmdr1* and *Pfcrt* markers in *P. falciparum* isolates collected from western Kenya in comparison to clinical outcomes
Cheruiyot, Agnes	1021	Role of Antimalarial Drug Concentration in De Novo Selection of Drug Tolerant Plasmodium falciparum Parasite Strains *In Vitro*
Chukwuocha, Uchechukwu	1022	Exploring the antimalarial potential of dried whole plant (wp) cymbopogon citratus (lemon grass)
Coleman, Michael	1023	New tools for mapping insecticide resistance risk
D'Alessandro, Umberto	1024	Malaria residual transmission after Mass Drug Administration with dihydroartemisinin-piperaquine in The Gambia
Das, Smita	1025	Characterization of Biomarkers and Alere™ Malaria Ag P.f RDT Performance in Myanmar and Uganda
DePina, Adilson	1026	Malaria in Cabo Verde: Pre-elimination versus the Elimination
Dicko, Bakara	1027	Stakeholder Engagement Process for Importing Modified Sterile Male in Mali for Contained Use
Dinko, Bismarck	1038	Development of *Plasmodium falciparum* gametocytes in the human host and strategies to reduce malaria transmission
Esan, Ayodele	1028	Determination of Stress Induced in *Plasmodium Falciparum* Malaria Infected Individuals Using Cortisol, Malondialdehyde, Blood Glucose and Lipid Profile Level
Falade, Mofolusho	1039	Efficacy of *Curcuma domestica* in treating neurological complications of rodent malaria
Fernando, Sumadhya Deepika	1029	The risk of imported malaria in security forces personnel returning from overseas missions in the context of prevention of re-introduction of malaria to Sri Lanka
Fonseca, Ana Maria	1030	Pregnancy-specific serology to monitor malaria transmission in elimination contexts
Galatas, Beatriz	1031	*In-Vivo* Efficacy of Chloroquine for the Treatment of Asymptomatic Infections in Mozambican Adults: A Randomized, Placebo-controlled Trial withImplications for Elimination Strategies
Garrido, Erika	1040	Evaluation of diagnostic strategies and the inclusion of placental malaria as potential etiology of low birth weight in newborns from an endemic area for malaria in Colombia
Gitaka, Jesse	1041	Malaria Re-emergence after MDA in a Hypo Endemic Island in Lake Victoria, Kenya
Gupta, Himanshu	1042	Molecular surveillance of antimalarial and diagnostic resistance in Mozambican *Plasmodium falciparum* isolates: implications for elimination strategies
Hadi, Melinda	1044	Increasing reports of insecticide resistance – a challenge for malaria control
Hiscox, Alexandra	1032	Mass mosquito trapping for malaria control: entomological impacts and insights for future programmes
Horii, Toshihiro	1033	Do not forget the blood-stage: BK-SE36/CpG in Clinical Trial

Poster Session 2

Tuesday, February 21 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Jang, Ihn Kyung	2001	New Monoclonal Antibodies Against *Plasmodium falciparum* HRP2 Suitable for Malaria Diagnosis
Jones, Gareth	2002	Assessing National Malaria Surveillance Systems Across East Africa
Kabbale, Fredrick	2035	Biting Times of *Plasmodium falciparum*-Infected Mosquitoes and Transmission Intensities Following Five Years of Insecticide-Treated Bed Nets Use in Kamuli District, Uganda: Implications for Malaria Control
Kasule, Jingo	2003	Trimethoprim-Sulfamethoxazole Plasma Concentrations are Subtherapeutic for Plasmodium falciparum in HIV-exposed, Uninfected Children in a Malaria Endemic Area
Kataoka, Masatoshi	2004	Application of a cell microarray chip system for accurate, highly sensitive and rapid diagnosis for malaria
Katsayal, Umar	2005	Perceptions of Traditional Medical Practitioners on Malaria Treatment
Kimani, Francis	2006	Evaluation of the Efficacy of Artemisinin Combination Therapy in Malaria endemic areas in Kenya; an East Africa Public Health Laboratory Networking Project
King, Charles	2007	Development of Transmission Blocking Interventions to Accelerate Malaria Parasite Elimination and Eradication: The Role of Monoclonal Antibodies
Kisangala, Ephraim	2008	The Prevalence and Treatment Outcomes of Children Admitted with Cerebral Malaria at Kampala International University Teaching Hospital Paediatrics Ward
Kudom, Andreas	2036	Characterization of pollution in *Anopheles* and *Culex* larval breeding habitats in urban area in Ghana
Kumar, Malkeet	2009	Repositioning of Astemizole as an anti-plasmodial agent
Kweka, Eliningaya	2010	The influence of age on insecticide susceptibility of *Anopheles arabiensis* during dry and rainy seasons in rice irrigation schemes of Northern Tanzania
Kyambadde, Paul	2042	Bio-efficacy of selected synergistically enhanced pyrethroid and pyrethroid-only impregnated long-lasting insecticidal nets against pyrethroid resistant *Anopheles gambiaes.l.* from Eastern Uganda
Le Manach, Claire	2011	Lead optimization of a series of 2-aminopyrazines leads to a potential drug candidate for the treatment of malaria
Leroy, Didier	2012	Addressing the malaria eradication agenda with next-generation antimalarials: Medicines for Malaria Venture's R&D portfolio
Lopes, Sergio	2013	Cross Border Surveillance initiatives targeting mobile and migrant populations: Lessons learned from Cambodia
Lubis, Inke	2014	The efficacy of Dihydroartemisinin-Piperaquine and Artemether-Lumefantrine in the treatment of uncomplicated *Plasmodium falciparum* malaria in North Sumatera, Western Indonesia: an open label, randomised, controlled trial
Machani, Maxwell	2015	Influence of blood meal and age of mosquitoes on susceptibility to pyrethroids in *Anopheles gambiae* from Western Kenya
Madiesse, Eugenie	2016	Molecular evaluation of Natural products-chloroquin combination on *Plasmodium* field isolate
Makuru, Victoria	2017	Comparison of traps used for mosquito sampling in Karama, Indonesia

Tuesday, February 21 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Markus, Miles	2018	Elimination of malaria: the tissue parasite reservoir
Masakhwe, Clement	2019	Plasmodium Infection Increases Epstein-Barr virus Viremia
Matambisso, Gloria	2037	Diagnostic performance of Microscopy and RDT to diagnose *Plasmodium falciparum* in different transmission settings of Manhiça district, Mozambique
Mawejje, Henry	2020	Associations of molecular markers with pyrethroid resistance from three sentinel sites with differing malaria transmission intensity in Uganda
Mayen, Gordon	2021	Malaria Elimination Efforts in a Conflict Zone: The Case of South Sudan, 2013-2015
Mayoka, Godfrey	2022	Potential Antiplasmodial Leads from Pyrido (1,2-a) benzimidazoles: Synthesis and Structure-Activity Relationship Studies
Medzihradsky, Oliver	2023	Assessment of Three Methods of Hotspot Prediction in the Pre-elimination Setting of Zambezi Region, Namibia
Misiani, Eunice	2024	Assessment of malaria vector control in South Africa: implications for malaria elimination
Mita, Toshihiro	2025	Detection of artemisinin-resistant *Plasmodium falciparum* isolates with *ex-vivo* ring-stage survival assay in Uganda
Mogaji, Hammed	2026	Prevalence of Asymptomatic Malaria, and How Literates Prevent, Diagnose and Treat Malaria: An excerpt from the 2016 Annual World Malaria Day Celebration Report in the Federal University of Agriculture, Abeokuta, Ogun State, Nigeria
Mogire, Reagan	2027	Repositioning of approved drugs for use against *Plasmodium falciparum* using *in silico* and *in vitro* approaches
Motevalli Haghi, Afsaneh	2038	Allelic variations of *Plasmodium vivax* Apical Membrane Antigen -1 (*Pv* AMA-1) in malarious areas of southeastern Iran using PCR -RFLP technique
Mugenyi, Levicatus	2028	Estimating age-time dependent malaria force of infection accounting for unobserved heterogeneity
Mugume, Ronald	2039	Prevalence of Sickle Cell Carriers and Sickle Cell Disease in Patients Who Come for Routine Checkup At Health Facilities in Mukono District
Mwangi, Harrison	2029	Structure of the 40S ribosomal subunit from *Plasmodium falciparum* by Homology and *de novo* modeling
Mwangi, Victor	2030	Repositioning methylene blue for the management of resistant malaria
Mwania, Mercy	2031	Existence of Anopheles rivulorum species in Homabay County,Kenya
Namirembe, Elizabeth	2040	Deletions of *pfhrp2* and *pfhrp3* in RDT-negative *Plasmodium falciparum* isolates from Uganda
Namukwaya, Annet	2032	Knowledge, Attitudes and Practice Survey on malaria in Kiimi, and Nsadzi islands in, Lake Victoria, Mukono District Uganda
Natama, Hamtandi Magloire	2033	Malaria incidence and prevalence during the first 12 months of life in Burkina Faso: a birth cohort study
Njunda, Anna	2034	Comparative Evaluation of a Rapid Diagnostic Test, an Antibody Elisa and an Antigen Pldh Elisa In Detecting Asymptomatic Malaria Parasitaemia In Blood Donors Attending The Buea Regional Hospital
Nock, Ishaya	2041	Preliminary Observations on the Inhibition of Mosquito Breeding in Containers with Water Containing Ivermectin Formulations

Poster Session 3

Wednesday, February 22 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Nnamani, Petra	3001	Preparation, characterization and *in vivo* antiplasmodial potential of Carrageenan and *Prosopis africana* buccal films of artemether on malariogenic rats
Nolan, Tony	3002	Building and Testing Gene Drives to Control Populations of Malaria Vectors
Nsagha, Dickson	3003	Community health workers' knowledge, attitudes and practices regarding malaria control and prevention in Bamenda, Cameroon: a community based survey
Nuralitha, Suci	3004	Within-host selection of drug resistance in a mouse model of repeated interrupted treatment of *Plasmodium yoelii* malaria infection
Nyasembe, Vincent	3035	Potential of natural plant sources of malaria vectors in malaria control
Nyataya, Josphat	3005	A PCR Method for Evaluating Clonal Abundance of *Plasmodium falciparum*
Ochieng, Beatrice	3006	Malaria Mortality Audit among Children in Kakamega County, Kenya, June 2015
Ochieng, Daudi	3007	Towards malaria elimination: Client and private health provider perspectives on the use of malaria rapid diagnostic tests in Wakiso district, Uganda
Ockenhouse, Chris	3036	Developmental Pathway of RTS,S for Malaria Elimination
Okanlawon, Babatunde	3037	Non-Secretors of ABH Antigens Are Susceptible to Falciparum Malaria
Okedi, Loyce	3045	Malaria Sentinel Surveillance in Uganda: Support supervision actions in the Lango/Gulu region, Northern Uganda
Olaniyan, Subulade	3038	Comparison of Hematologic parameters among adolescents with and without asymptomatic malaria in Ibadan, Nigeria
Olubayo, Luicer	3008	Artemisinin-based combination therapy efficacy in Kisumu, Western Kenya: selection of parasite subpopulations of *Plasmodium falciparum* with attenuated response to ACTs
Oluwasogo, Adewole	3009	Diversity and Abundance of Anopheles (Diptera: Culicidae) Species Complex in some Selected Settlements in Ogbomoso Local Government Area of Oyo-State, Nigeria
Opondo, Kevin	3010	Does Insecticide Resistance Contribute to Heterogeneity in Malaria Transmission in The Gambia?
Oyeyemi, Abisoye	3039	Diagnostic testing and treatment of malaria by Patent and Proprietary Medicine Vendors in rural communities of Bayelsa State of Nigeria: lessons for Malaria Elimination Programmes
Portugal, Silvia	3011	The silent reservoir of *P. falciparum* during the dry season
Preiser, Peter	3012	Identification of novel chemotypes for the treatment of *Plasmodium falciparum*
Rek, John	3013	Characterizing microscopic and submicroscopic malaria parasitemia at three sites with varied transmission intensity in Uganda
Rodrigues, Janneth	3014	Optimization of *Plasmodium falciparum in vitro* gametocyte culture for successful malaria transmission in mosquitoes
Romuald, Agonhossou	3015	Validity of the diagnostic testing of malaria in clinical practice by standard thick film Comparative Study of the malaria parasitemia from venous and capillary blood in hospital area in Benin
Rosanas-Urgell, Anna	3016	Characterization of the human malaria reservoir throughout the dry season in a forested area of Central Vietnam: a pilot study

Wednesday, February 22 | 19:30–22:00
Victoria Ballroom

Presenter	Poster #	Abstract Title
Rovira-Vallbona, Eduard	3017	Predominance of asymptomatic and sub-microscopic infections characterize the *Plasmodium vivax* gametocyte reservoir in the Peruvian Amazon
Saiki, Erisha	3040	Preventing malaria by adjusting amino-acid intake
Santana, Rosa	3018	The mosquito melanization response in defense against the *plasmodium vivax* infection
Shanks, Dennis	3020	Is there a requirement for 8-aminoquinolines during malaria elimination?
Shumba, Constance	3041	Shaping the future for elimination: Supporting use of Malaria Rapid Diagnostic Tests and adherence to results in the private sector in Uganda
Sumari, Deborah	3022	A modified Magnetic cytosmear device for cytological analyses in global health and diseases
Swedberg, Gote	3023	Using variable genes to analyse recrudescence and re-infections after treatment with artemether/lumefantrine in Tanzania
Sylla, Lakamy	3024	Preparedness of a Containment Laboratory in Prelude of Genetic Strategies Studies for Mosquito Control in Mali
Tarimo, Brian	3025	Oxidative Stress "management" is essential for *Anopheles* survival post *Plasmodium* infected blood meal ingestion
Tchouassi, David	3042	Can combining attractive odorants from plant and animal sources lead to improved lure for surveillance of the malaria vector?
Thomsen, Edward	3026	Decision support tools for insecticide resistance management
Thomson Luque, Richard	3027	Affordable outdoor-screened shelters can aid malaria control and elimination
Ubillos, Itziar	3028	Immunogenicity elicited by the malaria vaccine candidate RTS,S/AS01E in African children: effect of age, malaria transmission intensity and association with protective efficacy
Udoh, Bernice	3029	*Plasmodium falciparum* Genetic Diversity and Complexity of infection based on Merozoite Surface Protein 2 Gene Polymorphism among Type 2 Diabetes Patients in a Rural Health District of Nigeria
Uthaipibull, Chairat	3043	Identifying Malaria Box compounds targeting dihydrofolate reductase-thymidylate synthase (DHFR-TS)-attenuated transgenic *Plasmodium falciparum*
van den Hoogen, Lotus	3030	The use of antimalarial antibody measurements to assist elimination activities in Haiti
Walker, Patrick	3031	Estimating the most efficient allocation of interventions to achieve reductions in Plasmodium falciparum malaria burden and transmission in Africa
Wamae, Kevin	3032	Evaluation of Risk of Developing Febrile Malaria in *P. falciparum* infected vs. Uninfected Children in different Malaria Transmission Settings of Coastal Kenya
Wu, Lindsey	3033	Assessing short-term serological responses to changes in malaria exposure in The Gambia using a multiplex bead-based immunoassay of novel P. falciparum antigens
Yusuf, Oyindamola	3044	Decomposition of Changes in Malaria Prevalence Among Under-Five Children in Nigeria (2003-2013)
Zharov, Vladimir	3034	Ultrasensitive noninvasive label-free photoacoustic malaria diagnosis and eradication

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Translational Vaccinology for Global Health (S1)
Organizers: Christopher L. Karp, Gagandeep Kang and Rino Rappuoli
Oct 25–29, 2016 | Park Plaza Riverbank | London | United Kingdom

Phytobiomes: From Microbes to Plant Ecosystems (S2)
Organizers: Jan E. Leach, Kellye A. Eversole, Jonathan A. Eisen and Gwyn Beattie
Nov 8–12, 2016 | Hilton Santa Fe Historic Plaza Hotel | Santa Fe, New Mexico | USA

Hemorrhagic Fever Viruses (S3)
Organizers: William E. Dowling and Thomas W. Geisbert
Dec 4–8, 2016 | Hilton Santa Fe Historic Plaza Hotel | Santa Fe, New Mexico | USA

Cellular Stress Responses and Infectious Agents (S4)
Organizers: Margo A. Brinton, Sandra K. Weller and Beth Levine
Dec 4–8, 2016 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

Cell Plasticity within the Tumor Microenvironment (A1)
Organizers: Sergei Grivennikov, Florian R. Greten and Mikala Egeblad
Jan 8–12, 2017 | Big Sky Resort | Big Sky, Montana | USA

Precision Genome Engineering (A2)
Organizers: J. Keith Joung, Emmanuelle Charpentier and Olivier Danos
Jan 8–12, 2017 | Beaver Run Resort | Breckenridge, Colorado | USA

Transcriptional and Epigenetic Control in Stem Cells (J1)
Organizers: Konrad Hochedlinger, Kathrin Plath and Marius Wernig
joint with
Neurogenesis during Development and in the Adult Brain (J2)
Organizers: Alysson R. Muotri, Kinichi Nakashima and Xinyu Zhao
Jan 8–12, 2017 | Resort at Squaw Creek | Olympic Valley, California | USA

TGF-ß in Immunity, Inflammation and Cancer (A3)
Organizers: Wanjun Chen, Joanne E. Konkel and Richard A. Flavell
Jan 9–13, 2017 | Sagebrush Inn & Suites | Taos, New Mexico | USA

Mitochondria Communication (A4)
Organizers: Jared Rutter, Cole M. Haynes and Marcia C. Haigis
Jan 14–18, 2017 | Sagebrush Inn & Suites | Taos, New Mexico | USA

New Developments in Our Basic Understanding of Tuberculosis (A5)
Organizers: Samuel M. Behar and Valerie Mizrahi
Jan 14–18, 2017 | Fairmont Hotel Vancouver | Vancouver, British Columbia | Canada

PI3K Pathways in Immunology, Growth Disorders and Cancer (A6)
Organizers: Leon O. Murphy, Klaus Okkenhaug and Sabina C. Cosulich
Jan 19–23, 2017 | Hilton Santa Fe Historic Plaza Hotel | Santa Fe, New Mexico | USA

Biobetters and Next-Generation Biologics:
Innovative Strategies for Optimally Effective Therapies (A7)
Organizers: Cherié L. Butts, Amy S. Rosenberg, Amy D. Klion and Sachdev S. Sidhu
Jan 22–26, 2017 | Snowbird Resort | Snowbird, Utah | USA

Diabetes (J3)
Organizers: Jiandie Lin, Clay F. Semenkovich and Rohit N. Kulkarni
joint with
Obesity and Adipose Tissue Biology (J4)
Organizers: Marc L. Reitman, Ruth E. Gimeno and Jan Nedergaard
Jan 22–26, 2017 | Keystone Resort | Keystone, Colorado | USA

Omics Strategies to Study the Proteome (A8)
Organizers: Alan Saghatelian, Chuan He and Ileana M. Cristea
Jan 29–Feb 2, 2017 | Beaver Run Resort | Breckenridge, Colorado | USA

Epigenetics and Human Disease:
Progress from Mechanisms to Therapeutics (A9)
Organizers: Johnathan R. Whetstine, Jessica K. Tyler and Rab K. Prinjha
Jan 29–Feb 2, 2017 | Sheraton Seattle Hotel | Seattle, Washington | USA

Hematopoiesis (B1)
Organizers: Catriona H.M. Jamieson, Andreas Trumpp and Paul S. Frenette
Jan 31–Feb 4, 2017 | Fairmont Banff Springs | Banff, Alberta | Canada

Noncoding RNAs: From Disease to Targeted Therapeutics (J5)
Organizers: Kevin V. Morris, Archa Fox and Paloma Hoban Giangrande
joint with
Protein-RNA Interactions: Scale, Mechanisms, Structure and Function of Coding and Noncoding RNPs (J6)
Organizers: Gene W. Yeo, Jernej Ule, Karla Neugebauer and Melissa J. Moore
Feb 5–9, 2017 | Fairmont Banff Springs | Banff, Alberta | Canada

Inflammation-Driven Cancer: Mechanisms to Therapy (J7)
Organizers: Fiona M. Powrie, Michael Karin and Alberto Mantovani
joint with
Microbiome in Health and Disease (J8)
Organizers: Julie A. Segre, Ramnik Xavier and William Michael Dunne
Feb 5–9, 2017 | Keystone Resort | Keystone, Colorado | USA

Autophagy Network Integration in Health and Disease (B2)
Organizers: Ivan Dikic, Katja Simon and J. Wade Harper
Feb 12–16, 2017 | Copper Mountain Resort | Copper Mountain, Colorado | USA

Asthma: From Pathway Biology to Precision Therapeutics (B3)
Organizers: Clare M. Lloyd, John V. Fahy and Sally Wenzel-Morganroth
Feb 12–16, 2017 | Keystone Resort | Keystone, Colorado | USA

Viral Immunity: Mechanisms and Consequences (B4)
Organizers: Akiko Iwasaki, Daniel B. Stetson and E. John Wherry
Feb 19–23, 2017 | Hilton Santa Fe Historic Plaza Hotel | Santa Fe, New Mexico | USA

Malaria: From Innovation to Eradication (B5)
Organizers: Marcel Tanner, Sarah K. Volkman, Marcus V.G. Lacerda and Salim Abdulla
Feb 19–23, 2017 | Speke Resort & Conference Centre | Kampala | Uganda

Lipidomics and Bioactive Lipids in Metabolism and Disease (B6)
Organizers: Alfred H. Merrill, Walter Allen Shaw, Sarah Spiegel and Michael J.O.Wakelam
Feb 26–Mar 2, 2017 | Granlibakken Tahoe | Tahoe City, California | USA

Bile Acid Receptors as Signal Integrators in Liver and Metabolism (C1)
Organizers: Luciano Adorini, Kristina Schoonjans and Scott L. Friedman
Mar 3–7, 2017 | Hyatt Regency Monterey | Monterey, California | USA

Rare and Undiagnosed Diseases:
Discovery and Models of Precision Therapy (C2)
Organizers: William A. Gahl and Christoph Klein
Mar 5–8, 2017 | Fairmont Copley Plaza | Boston, Massachusetts | USA

mRNA Processing and Human Disease (C3)
Organizers: James L. Manley, Siddhartha Mukherjee and Gideon Dreyfuss
Mar 5–8, 2017 | Sagebrush Inn & Suites | Taos, New Mexico | USA

Synapses and Circuits: Formation, Function and Dysfunction (X1)
Organizers: Tony Koleske, Yimin Zou, Kristin Scott and A. Kimberley McAllister
joint with
Connectomics (X2)
Organizers: Olaf Sporns, Danielle Bassett and Jeremy Freeman
Mar 5–8, 2017 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

2016–2017 Keystone Symposia Meeting Series

*Dates, locations and details are subject to possible change. Please visit us online at **www.keystonesymposia.org** or join our various mailing lists or online networks for updates.*

Kinases: Next-Generation Insights and Approaches (C4)
Organizers: Reid M. Huber, John Kuriyan and Ruth H. Palmer
Mar 5–9, 2017 | Beaver Run Resort | Breckenridge, Colorado | USA

Tumor Metabolism: Mechanisms and Targets (X3)
Organizers: Brendan D. Manning, Kathryn E. Wellen and Reuben J. Shaw
joint with
Adaptations to Hypoxia in Physiology and Disease (X4)
Organizers: M. Celeste Simon, Amato J. Giaccia and Randall S. Johnson
Mar 5–9, 2017 | Whistler Conference Centre | Whistler, British Columbia | Canada

Engineered Cells and Tissues as Platforms for Discovery and Therapy (K1)
Organizers: Laura E. Niklason, Milica Radisic and Nenad Bursac
Mar 9–12, 2017 | Fairmont Copley Plaza | Boston, Massachusetts | USA

Frontiers of NMR in Life Sciences (C5)
Organizers: Kurt Wüthrich, Michael Sattler and Stephen W. Fesik
Mar 12–16, 2017 | Keystone Resort | Keystone, Colorado | USA

Sex and Gender Factors Affecting Metabolic Homeostasis, Diabetes and Obesity (C6)
Organizers: Franck Mauvais-Jarvis, Deborah Clegg and Arthur P. Arnold
Mar 19–22, 2017 | Granlibakken Tahoe | Tahoe City, California | USA

Cancer Immunology and Immunotherapy: Taking a Place in Mainstream Oncology (C7)
Organizers: Robert D. Schreiber, James P. Allison, Philip D. Greenberg and Glenn Dranoff
Mar 19–23, 2017 | Fairmont Chateau Whistler | Whistler, British Columbia | Canada

Pattern Recognition Signaling: From Innate Immunity to Inflammatory Disease (X5)
Organizers: Thirumala-Devi Kanneganti, Vishva M. Dixit and Mohamed Lamkanfi
joint with
Type I Interferon: Friend and Foe Alike (X6)
Organizers: Alan Sher, Virginia Pascual, Adolfo García-Sastre and Anne O'Garra
Mar 19–23, 2017 | Fairmont Banff Springs | Banff, Alberta | Canada

Injury, Inflammation and Fibrosis (C8)
Organizers: Tatiana Kisseleva, Michael Karin and Andrew M. Tager
Mar 26–30, 2017 | Snowbird Resort | Snowbird, Utah | USA

HIV Vaccines (C9)
Organizers: Andrew B. Ward, Penny L. Moore and Robin Shattock
Mar 26–30, 2017 | Sheraton Steamboat Resort | Steamboat Springs, Colorado | USA

Immune Regulation in Autoimmunity and Cancer (D1)
Organizers: David A. Hafler, Vijay K. Kuchroo and Jane L. Grogan
Mar 26–30, 2017 | Whistler Conference Centre | Whistler, British Columbia | Canada

Molecular Mechanisms of Heart Development (X7)
Organizers: Benoit G. Bruneau, Brian L. Black and Margaret E. Buckingham
joint with
RNA-Based Approaches in Cardiovascular Disease (X8)
Organizers: Thomas Thum and Roger J. Hajjar
Mar 26–30, 2017 | Keystone Resort | Keystone, Colorado | USA

Genomic Instability and DNA Repair (Z1)
Organizers: Julia Promisel Cooper, Marco F. Foiani and Geneviève Almouzni
joint with
DNA Replication and Recombination (Z2)
Organizers: John F.X. Diffley, Anja Groth and Scott Keeney
Apr 2–6, 2017 | Santa Fe Community Convention Center | Santa Fe, New Mexico | USA

B Cells and T Follicular Helper Cells: Controlling Long-Lived Immunity (D2)
Organizers: Stuart G. Tangye, Ignacio Sanz and Hai Qi
Apr 23–27, 2017 | Whistler Conference Centre | Whistler, British Columbia | Canada

Mononuclear Phagocytes in Health, Immune Defense and Disease (D3)
Organizers: Steffen Jung and Miriam Merad
Apr 30–May 4, 2017 | Hyatt Regency Austin | Austin, Texas | USA

Modeling Viral Infections and Immunity (E1)
Organizers: Alan S. Perelson, Rob J. De Boer and Phillip D. Hodgkin
May 1–4, 2017 | Stanley Hotel | Estes Park, Colorado | USA

Angiogenesis and Vascular Disease (Z3)
Organizers: M. Luisa Iruela-Arispe, Timothy T. Hla and Courtney Griffin
joint with
Mitochondria, Metabolism and Heart (Z4)
Organizers: Junichi Sadoshima, Toren Finkel and Åsa B. Gustafsson
May 8–12, 2017 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

Neuronal Control of Appetite, Metabolism and Weight (Z5)
Organizers: Lora K. Heisler and Scott M. Sternson
joint with
Gastrointestinal Control of Metabolism (Z6)
Organizers: Randy J. Seeley, Matthias H. Tschöp and Fiona M. Gribble
May 9–13, 2017 | Tivoli Hotel and Congress Center | Copenhagen | Denmark

Aging and Mechanisms of Aging-Related Disease (E2)
Organizers: Kazuo Tsubota, Shin-ichiro Imai, Matt Kaeberlein and Joan Mannick
May 15–19, 2017 | Pacifico Yokohama | Yokohama | Japan

Single Cell Omics (E3)
Organizers: Sarah Teichmann, Evan W. Newell and William J. Greenleaf
May 26–30, 2017 | Clarion Hotel Sign | Stockholm | Sweden

Integrating Metabolism and Immunity (E4)
Organizers: Hongbo Chi, Erika L. Pearce, Richard A. Flavell and Luke A.J. O'Neill
joint with
Cell Death and Inflammation (K2)
Organizers: Seamus J. Martin and John Silke
May 29–June 2, 2017 | Royal Society Dublin | Dublin | Ireland

Neuroinflammation: Concepts, Characteristics, Consequences (E5)
Organizers: Richard M. Ransohoff, Christopher K. Glass and V. Hugh Perry
Jun 19–23, 2017 | Keystone Resort | Keystone, Colorado | USA

*Conference dates are listed with the first date typically being that of afternoon registration and an evening welcome mixer, and the last day when organized sessions conclude, usually in the evening with a closing plenary session followed by food and entertainment. However, some program formats vary. Please check our website for program specifics for each individual meeting. You can view each program directly by entering **www.keystonesymposia.org** and then / and the alpha-numeric program code (e.g., **www.keystonesymposia/17A1**).*

2017–2018 Keystone Symposia Conference Series

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Vectors, Pathogens and Diseases: Current Trends and Emerging Challenges (T1)
Organizers: Maureen Coetzee, Josiane Etang, Stephen Torr and Scott L. O'Neill
Sep 10–14, 2017 | Southern Sun Elangeni & Maharani | Durban, KwaZulu-Natal | South Africa

Maternal-Fetal Cross Talk: Harmony vs. Conflict (T2)
Organizers: Jeff Murray, Louis J. Muglia and Yoel Sadovsky
Oct 4–8, 2017 | Westin Washington, D.C. City Center | Washington, D.C. | USA

Regenerative Biology and Applications:
Cell Differentiation, Tissue Organization and Biomedical Engineering (T3)
Organizers: Paul K. Tam, Urban Lendahl and Freda D. Miller
Oct 15–19, 2017 | University of Hong Kong | Pok Fu Lam | Hong Kong

Antimicrobials and Resistance: Opportunities and Challenges (T4)
Organizers: Gautam Dantas and Jennifer A. Leeds
Oct 29–Nov 1, 2017 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

Frontiers of Serotonin Beyond the Brain (T5)
Organizers: Fusun Kilic, Michael D. Gershon and Luc Maroteaux
Nov 12–15, 2017 | Doubletree by Hilton – Park City | Park City, Utah | USA

Heart Failure: Crossing the Translational Divide (A1)
Organizers: Yibin Wang, Joseph A. Hill and Carolyn Lam
Jan 14–18, 2018 | Keystone Resort | Keystone, Colorado | USA

State of the Brain: Genetic Dissection of Brain Circuits
and Behavior in Health and Disease (A2)
Organizers: Sean Hill, Hongkui Zeng, Z. Josh Huang and György Buzsáki
Jan 14–18, 2018 | Keystone Resort | Keystone, Colorado | USA

T Cell Dysfunction, Cancer and Infection (A3)
Organizers: Daniel C. Douek, W. Nicholas Haining and Jedd D. Wolchok
Jan 16–20, 2018 | Beaver Run Resort | Breckenridge, Colorado | USA

Plant Signaling: Molecular Pathways and Network Integration (A4)
Organizers: Ken Shirasu, Uta Paszkowski and Christian S. Hardtke
Jan 21–24, 2018 | Granlibakken Tahoe | Tahoe City, California | USA

Natural Products and Synthetic Biology: Parts and Pathways (J1)
Organizers: Jon C. Clardy, Yi Tang and Sean F. Brady
Jan 21–24, 2018 | Resort at Squaw Creek | Olympic Valley, California | USA

Tumor Metabolism (A5)
Organizers: Heather Christofk, Christian Metallo and Alec Kimmelman
Jan 21–25, 2018 | Snowbird Resort | Snowbird, Utah | USA

Cell Death, Inflammation and Adaptation to Tissue Stress (A6)
Organizers: Pascal Meier, Eric H. Baehrecke and Kim Newton
Jan 21–25, 2018 | Beaver Run Resort | Breckenridge, Colorado | USA

DNA and RNA Methylation (A7)
Organizers: Chuan He and Ting Wang
Jan 21–25, 2018 | Fairmont Hotel Vancouver | Vancouver, British Columbia | Canada

Organ Crosstalk in Obesity and NAFLD (J3)
Organizers: Gary J. Schwartz, Bei B. Zhang and Christoph Buettner
joint with
Bioenergetics and Metabolic Disease (J4)
Organizers: Patrick Seale, Kendra K. Bence and P. Darrell Neufer
Jan 21–25, 2018 | Keystone Resort | Keystone, Colorado | USA

Ubiquitin Signaling (A8)
Organizers: David Komander and Sylvie Urbé
Jan 28–Feb 1, 2018 | Granlibakken Tahoe | Tahoe City, California | USA

Translational Systems Immunology (A9)
Organizers: Sally John, Soumya Raychaudhuri, Michael Vincent and Mark M. Davis
Jan 28–Feb 1, 2018 | Snowbird Resort | Snowbird, Utah | USA

Precision Genome Editing with Programmable Nucleases (B1)
Organizers: Jin-Soo Kim, Feng Zhang and Daniel F. Voytas
Jan 28–Feb 1, 2018 | Keystone Resort | Keystone, Colorado | USA

Emerging Technologies in Vaccine Discovery and Development (J5)
Organizers: David Kaslow, Nicholas Jackson and Ann L. Lee
joint with
Progress and Pathways Toward an Effective HIV Vaccine (J6)
Organizers: M. Juliana McElrath, Pamela J. Bjorkman and Beatrice H. Hahn
Jan 28–Feb 1, 2018 | Fairmont Banff Springs | Banff, Alberta | Canada

Atherosclerosis: Lessons Learned and Concepts Challenged (B2)
Organizers: Laura F. Michael, Gerard Pasterkamp and Sekar Kathiresan
Feb 4–8, 2018 | Sagebrush Inn & Suites | Taos, New Mexico | USA

Frontiers in Islet Biology and Diabetes (B3)
Organizers: Matthias Hebrok, Seung K. Kim, Felicia Pagliuca and Anil Bhushan
Feb 4–8, 2018 | Keystone Resort | Keystone, Colorado | USA

Cryo-EM from Cells to Molecules:
Multi-Scale Visualization of Biological Systems (F1)
Organizers: Georgios Skiniotis, Elizabeth Villa and Andrew B. Ward
Feb 4–8, 2018 | Granlibakken Tahoe | Tahoe City, California | USA

Cancer Epigenetics: New Mechanisms, New Therapies (B4)
Organizers: François Fuks and Anne Brunet
Feb 10–14, 2018 | Beaver Run Resort | Breckenridge, Colorado | USA

Phosphoinositide Biology: New Therapeutic Targets Beyond Class I PI3K (B5)
Organizers: Emilio Hirsch, Tamas Balla and Cristina Donini
Feb 11–15, 2018 | Sagebrush Inn & Suites | Taos, New Mexico | USA

Emerging Cellular Therapies: T Cells and Beyond (B6)
Organizers: Carl H. June, Marcela V. Maus and Bruce R. Blazar
joint with
Lymphocytes and their Roles in Cancer (R1)
Organizers: Iannis Aifantis, Ugur Sahin and Mikala Egeblad
Feb 11–15, 2018 | Keystone Resort | Keystone, Colorado | USA

Mobile Genetic Elements and Genome Plasticity (B7)
Organizers: Marlene Belfort, Evan E. Eichler, Henry L. Levin and Lynne E. Maquat
Feb 11–15, 2018 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

GPCR Structure and Function:
Taking GPCR Drug Development and Discovery to the Next Level (B8)
Organizers: Roger K. Sunahara and Christian Felder
Feb 16–20, 2018 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

Regulation and Dysregulation of Innate Immunity in Disease (B9)
Organizers: Lynda M. Stuart, Kathryn J. Moore and Kate L. Jeffrey
Feb 18–22, 2018 | Fairmont Hotel Vancouver | Vancouver, British Columbia | Canada

Antibodies as Drugs: Translating Molecules into Treatments (C1)
Organizers: Paul W. H. I. Parren and Erica Ollmann Saphire
Feb 25–Mar 1, 2018 | Whistler Conference Centre | Whistler, British Columbia | Canada

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Noncoding RNAs: Form, Function, Physiology (C2)
Organizers: Joshua T. Mendell, Igor Ulitsky and Sohail F. Tavazoie
Feb 25–Mar 1, 2018 | Keystone Resort | Keystone, Colorado | USA

Endoderm Development and Disease:
Cross-Organ Comparison and Interplay (C3)
Organizers: Xin Sun, Kat Hadjantonakis and Didier Y. R. Stainier
Feb 25–Mar 1, 2018 | Sagebrush Inn & Suites | Taos, New Mexico | USA

Uncomplicating Diabetes:
Reducing the Burden of Diabetes-Related End-Organ Injury (J7)
Organizers: Mark E. Cooper, Thomas M. Coffman, Daniel Timmermann and Susan Quaggin
joint with
Vascular Biology and Human Diseases:
From Molecular Pathways to Novel Therapeutics (J8)
Organizers: Elisabetta Dejana, Anne C. Eichmann and Gavin O. Thurston
Feb 25–Mar 1, 2018 | Eldorado Hotel & Spa | Santa Fe, New Mexico | USA

Immunological Memory: Innate, Adaptive and Beyond (X1)
Organizers: Rafi Ahmed, Susan M. Kaech and Joseph C. Sun
joint with
Aging, Inflammation and Immunity (X2)
Organizers: Bonnie B. Blomberg and Graham Pawelec
Feb 25–Mar 1, 2018 | Hyatt Regency Austin | Austin, Texas | USA

Manipulation of the Gut Microbiota for Metabolic Health (X3)
Organizers: Nathalie Delzenne and Liping Zhao
joint with
Microbiome, Host Resistance and Diseases (X4)
Organizers: Wendy S. Garrett, Yasmine Belkaid and Janelle S. Ayres
Mar 4–8, 2018 | Fairmont Banff Springs | Banff, Alberta | Canada

Intrinsic Defenses and Counterdefenses (C4)
Organizers: Sara R. Cherry, Craig R. Roy and Harmit S. Malik
Mar 23–26, 2018 | Hyatt Regency Monterey | Monterey, California | USA

Cancer Immunotherapy: Combinations (C5)
Organizers: Chris R. Boshoff, Lieping Chen and Lisa Coussens
Mar 23–27, 2018 | Fairmont The Queen Elizabeth | Montreal, Québec | Canada

Chromatin Architecture and Chromosome Organization (X5)
Organizers: Edith Heard and Peter Fraser
joint with
Gene Control in Development and Disease (X6)
Organizers: Richard A. Young, Joanna Wysocka and Phillip A. Sharp
Mar 23–27, 2018 | Whistler Conference Centre | Whistler, British Columbia | Canada

The Resolution of Inflammation in Health and Disease (C6)
Organizers: Catherine Godson, Ira Tabas and Mauro Perretti
Mar 24–28, 2018 | Royal Dublin Society | Dublin | Ireland

iPSCs: A Decade of Progress and Beyond (C7)
Organizers: Shinya Yamanaka, Haruhisa Inoue and Yanhong Shi
Mar 25–29, 2018 | Resort at Squaw Creek | Olympic Valley, California | USA

Organs- and Tissues-on-Chips (D1)
Organizers: Christopher P. Austin, Danilo Tagle, Christine L. Mummery and Brian R. Berridge
Apr 8–12, 2018 | Big Sky Resort | Big Sky, Montana | USA

Myeloid Cells (D2)
Organizers: Edward J. Pearce, Florent Ginhoux and Ana-Maria Lennon-Duménil
Apr 8–12, 2018 | Beaver Run Resort | Breckenridge, Colorado | USA

Therapeutic Targeting of Hypoxia-Sensitive Pathways (V1)
Organizers: Chris W. Pugh, Pablo Wappner, Johanna Myllyharju and Moira K. Whyte
Apr 10–14, 2018 | University of Oxford Mathematical Institute | Oxford | UK

Pushing the Limits to Healthspan and Longevity (D3)
Organizers: Rochelle Buffenstein, Holly Brown-Borg and Colin Selman
Apr 15–19, 2018 | Herrenhausen Palace | Hannover | Germany

Tuberculosis:
Translating Scientific Findings for Clinical and Public Health Impact (X7)
Organizers: Graeme Meintjes, Eric J. Rubin and Sabine Ehrt
joint with
HIV and Co-Infections: Pathogenesis, Inflammation and Persistence (X8)
Organizers: Irini Sereti, Nicolas Chomont and Michaela Müller-Trutwin
Apr 15–19, 2018 | Fairmont Chateau Whistler | Whistler, British Columbia | Canada

Mitochondrial Biology (Z1)
Organizers: Jodi Nunnari, Anu Suomalainen-Wartiovaara and Koji Okamoto
joint with
Selective Autophagy (Z2)
Organizers: Tamotsu Yoshimori, Hong Zhang and Anne Simonsen
Apr 22–26, 2018 | Westin Miyako Kyoto | Kyoto | Japan

Precision Medicine in Cancer (E1)
Organizers: Richard Rosenquist, Elaine Mardis and Charles M. Perou
May 6–10, 2018 | Clarion Hotel Sign | Stockholm | Sweden

Exosomes/Microvesicles:
Heterogeneity, Biogenesis, Function and Therapeutic Developments (E2)
Organizers: Crislyn D'Souza-Schorey and David Lyden
Jun 4–8, 2018 | Beaver Run Resort | Breckenridge, Colorado | USA

One Million Genomes: From Discovery to Health (G1)
Organizers: Geoffrey S. Ginsburg, Teri Manolio and Patrick Boon Ooi Tan
Jun 4–8, 2018 | Herrenhausen Palace | Hannover | Germany

Novel Aspects of Bone Biology (E3)
Organizers: Gerard Karsenty and David T. Scadden
Jun 13–16, 2018 | Snowbird Resort | Snowbird, Utah | USA

B Cells: Mechanisms in Immunity and Autoimmunity (E4)
Organizers: Lars Nitschke, Michael Reth, Roberta Pelanda and David M. Tarlinton
Jun 17–21, 2018 | Maritim Hotel & Conference Center Dresden | Dresden | Germany

Advances in Neurodegenerative Diseases Research and Therapy (Z3)
Organizers: Li Gan, Leonard Petrucelli and Morgan H. Sheng
joint with
New Frontiers in Neuroinflammation:
What Happens When CNS and Periphery Meet? (Z4)
Organizers: Marco Prinz, Jonathan Kipnis and Irene Knuesel
Jun 17–21, 2018 | Keystone Resort | Keystone, Colorado | USA

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