

Report

IUIS-FAIS-IMMUNO-BENIN 2019

Impact of tropical infections on mother and child immunity

2nd Regional West Africa Immunology

3rd – 10th November 2019

Benin Diaspora Hotel, Ouidah, Benin

Organizers

Dr. Tomabu Adjobimey (Faculty of Science and Technology (FAST), University of Abomey-Calavi (UAC), Benin)

Prof. André Bigot (Faculté des Sciences de la Santé (FSS), UAC, Ministère de l'Enseignement Supérieur et de la Recherche Scientifique)

Dr. Gatien Lokossou (Ecole Polytechnique d'Abomey-Calavi (EPAC))

Dr. Tatiana Hountohotegbe (Institut de Recherche pour le Développement (IRD), Benin)

Dr. Léonce Kouakanou (FAST, University of Abomey-Calavi/University of Kiel, Germany)

Dr. Fabien Prodjinotho (FAST, University of Abomey-Calavi/Technical University of Munich, Germany)

Prof. Dieter Kabelitz (University of Kiel, Germany, Chair of the IUIS-Education (EDU) Committee)

Prof. Ridha Barbouche (Institut Pasteur de Tunis, Tunisia, FAIS Board and IUIS-EDU Committee member)

Prof. Michelle Letarte (SickKids Hospital and University of Toronto, Canada, IUIS-EDU Committee Past-Chair)

Prof. Clive Gray (University of Cape Town, FAIS Secretary, IUIS-EDU Committee Vice-Chair)

Dr. Pa Tamba Ngom (Vice-Chair of FAIS)

Introduction

The IUIS-FAIS Immuno-Benin course was a 6-day workshop held on 3rd – 10th November 2019 at the Diaspora Hotel in Ouidah, approximately 35 km from Cotonou. This course was organized by the Education Committee of IUIS in cooperation with FAIS and with faculty from Benin, with the goal of disseminating Immunology knowledge in Africa. The topic of Immuno-Benin 2019 was “Impact of tropical infections on mother and child immunity” and particularly reflects the importance of health issues in this part of the world. Among other important topics addressed in this course were the therapeutic application of medicinal plants,

the immunology of malaria, tuberculosis, HIV, and neglected tropical diseases. Special emphasis was on aspects related to mother and child health in Africa. The course brought together 49 participants from 13 African countries and Germany, and the international faculty included experts from Africa, Europe, and Canada. Apart from the lectures, the participants were involved in group assignments for grant writing sessions, two poster sessions, and two round table discussions with the experts.

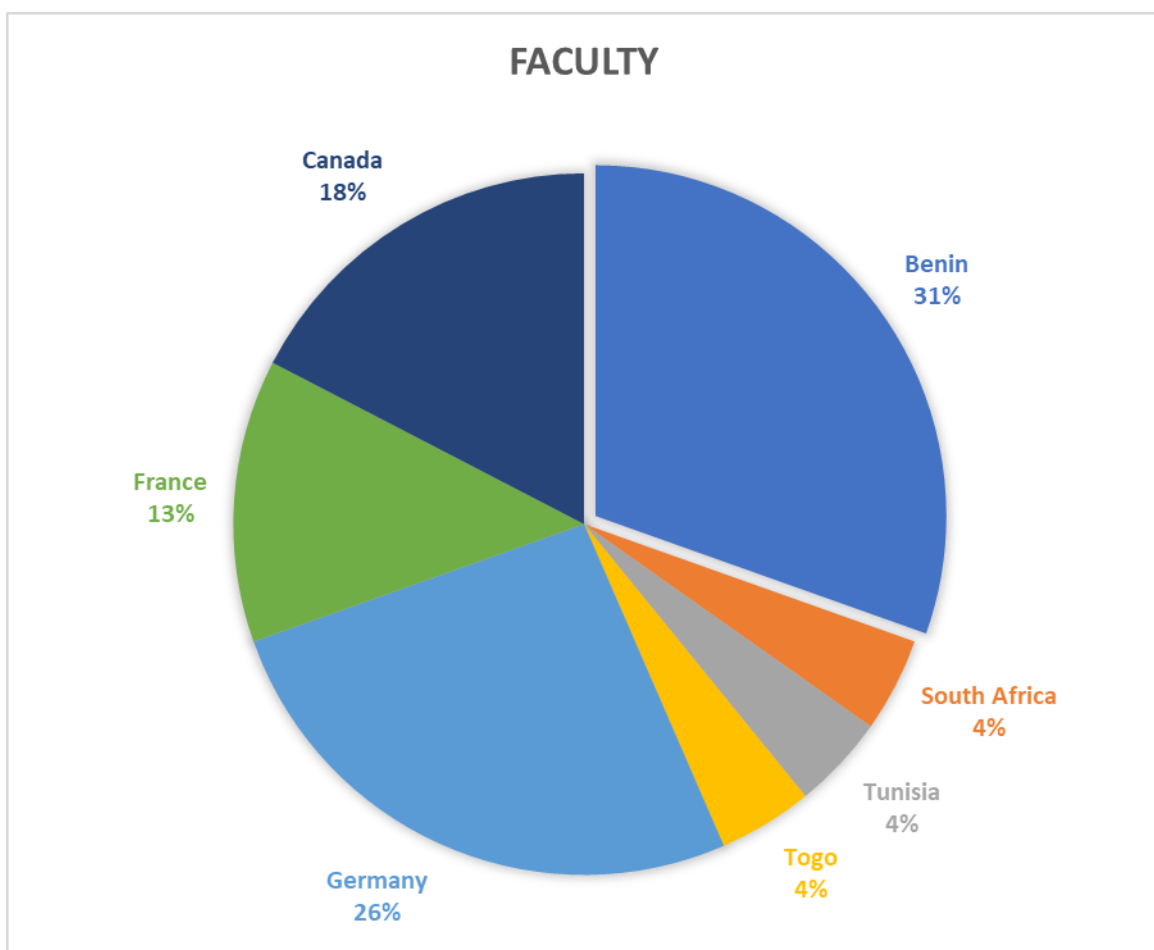
This course was very generously sponsored by the Volkswagen Foundation through a grant to support “Regional Immunology Schools in Sub-Saharan Africa”

Faculty

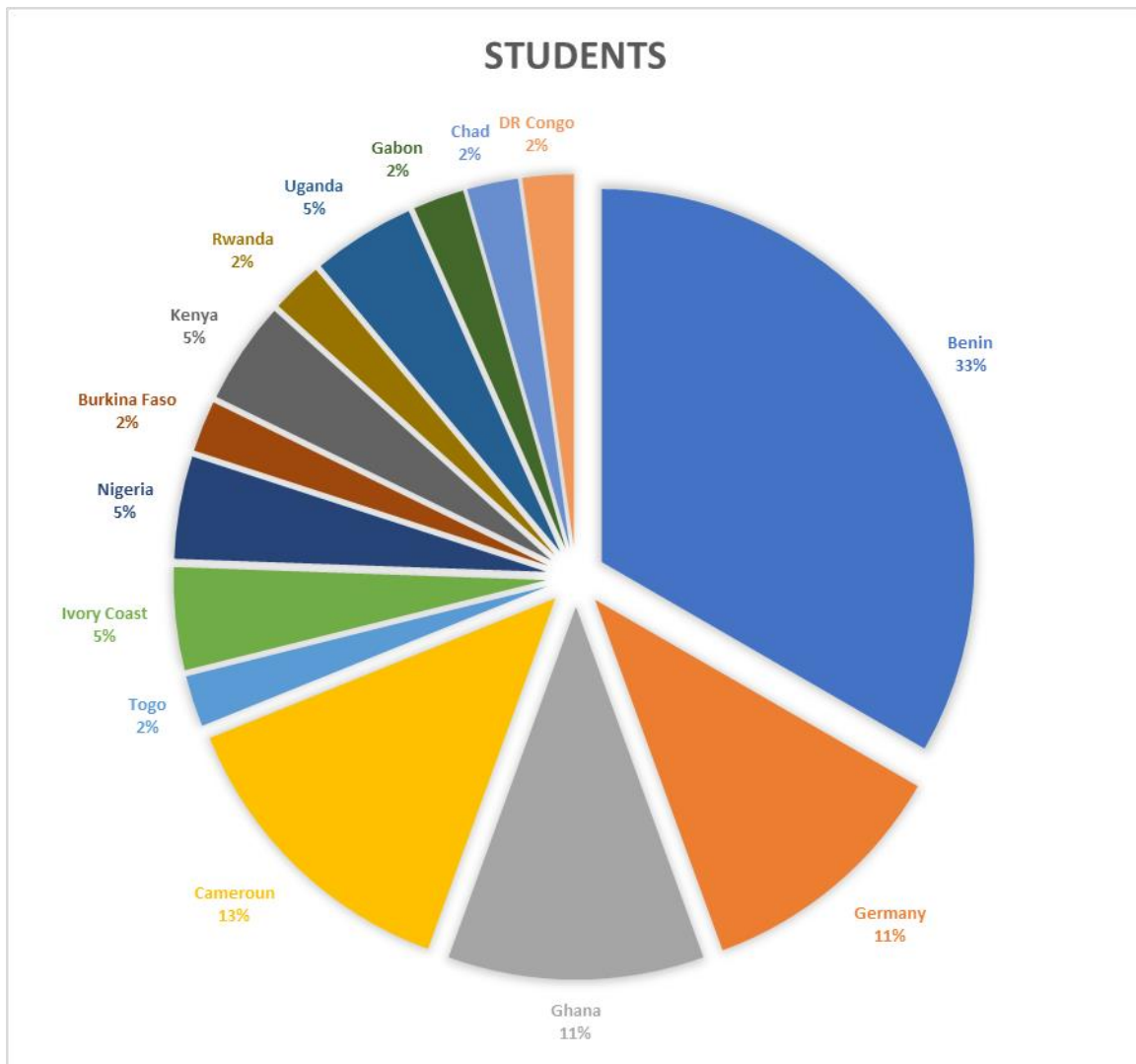
- Dr. Tomabu Adjobimey (University of Abomey Calavi, Benin)
- Prof. Dissou Afolabi (University of Abomey Calavi, Benin)
- Prof Akadiri Yesoufou, (University of Abomey Calavi, Benin)
- Prof. Latifou Lagnika (University of Abomey Calavi, Benin)
- Dr. Gatien Lokossou (University of Abomey Calavi, Benin)
- Dr. Luc Djogbenou (University of Abomey Calavi, Benin)
- Dr. Prodjinotho Fabien (University of Abomey Calavi, Benin)
- Dr. Gnatoulma Katawa ((University of Lome, Togo)
- Prof. Clive Gray (University of Cape Town, South Africa)
- Prof. Ridha Barbouche (Institut Pasteur de Tunis, Tunisia, Tunisia)
- Prof. Marc Huebner (University of Bonn, Germany)
- Prof. Dieter Kabelitz (University of Kiel, Germany)
- Dr. Manuel Ritter (University of Bonn, Germany)
- Prof. Carsten Watzl (Technical University Dortmund, Germany)
- Prof. Jürgen Wienands (University of Goettingen, Germany)
- Prof. Clarissa Prazeres da Costa (Technical University Munich, Germany)
- Prof. Diana Dudziak (University Clinic Erlangen, Germany)
- Prof. Thomas Kamradt (University of Jena, Germany)
- Prof. Adrian Luty (IRD, France/Benin)
- Dr. Nadine Fievet (IRD, France/Benin)
- Dr. Stanislas Tomavo (Université de Lille & Paris-Sud, France)
- Prof. Eleanor Fish (University of Toronto, Canada)
- Prof. Michelle Letarte (University of Toronto, Canada)
- Dr. Yanet Valdez (University of British Columbia-Vancouver, Canada)
- Dr. Kelly McNagny (University of British Columbia-Vancouver, Canada)
- Dr. Caroline Dunk (University of Toronto, Canada)

Participants

The faculty was composed of an international panel of experts in immunology and tropical diseases. 31% of the faculty (the majority) was from Benin, 26% was from Germany, 18% from Canada, and 13 % from France.



49 graduate and post-doctoral students from 13 African Countries: Benin, Togo, Ghana, Nigeria, Rwanda, Uganda, Kenya, Chad, Burkina, Cameroon, Ivory Coast, Gabon, DR Congo, and Germany effectively participated in the course. The majority of the participants (33%) were Beninese, 11% were from Germany while the rest was from other African countries.



Inauguration and welcome address by the organizers

The inauguration started at 8.30 am with a welcome address by Prof. Dieter Kabelitz and Dr. Tomabu Adjobimey. Dr. Adjobimey used the opportunity to acknowledge the memory of Prof. Evelyne Lozes, a member of the local organization team, who passed away a couple of weeks before the beginning of the course. This introduction was followed by a presentation from all participants.

Keynote lecture by Prof. Adrian Luty

Prof. Adrian Luty went on with a keynote presentation on the “concept of tropical immunology”. This introductory lecture emphasized the importance of immunology in the tropics and gave insights into how immunological research will support sustainable development in developing countries.

Official opening ceremony and Welcome addresses by local authorities

The keynote lecture was followed by the official opening ceremony by the academic authorities of the University of Abomey-Calavi, Prof. Hounnakpon Yedomonhan (Dean of the Faculty of Science and Technology) and Dr. Moufoutaou Adjera (Chief of Staff of the University of Abomey-Calavi), representing the Rector. The official opening ceremony was covered and broadcasted by both Benin national radio and television (ORTB) (<https://www.youtube.com/watch?v=PHgp-vFhTqg>). During his welcome address, the Dean pinpointed the importance of international collaboration in science and ensured the organizers of the full support of his faculty. He particularly acknowledged the efforts of the local organization team whose dedication was determinant for the successful organization of ImmunoBenin 2019. The Chief of Staff then reminded the audience of the importance of the chosen topic for developing countries like Benin. He welcomed both the local and international faculty and participants, before expressing the gratitude of the whole Benin academical world to the international committee of the IUIS/EDU for choosing Benin to organize the 2nd edition of the IUIS-FAIS immunology course in West Africa. He wished the audience a successful meeting and assured the organizers of the full support of the University of Abomey-Calavi and the Benin government.

Sessions

Session 1: Basic Immunology-Innate and adaptive immunity (4th November)

This first session covered different aspects of innate and adaptive immunity. Prof. Carsten Watzl gave a lecture on the Recognition strategies of innate lymphoid and NK cells. Prof. Diana Dudziak followed with her talk on Antigen Presenting Cells: Dendritic cells, and Prof. Jürgen Wienands then talked about B cell activation, differentiation, and antibody production. After lunch, Prof. Thomas Kamradt gave his lecture on the development, the differentiation, and the functions of T cells. Prof. Dieter Kabelitz then concluded the first part of this session with a lecture on unconventional T cells (with emphasis on gamma delta T cells) and their role in bridging innate and adaptive immunity. After a short coffee break, the participants got the chance to discuss the different topics of the session with the faculty during a round table discussion.

Finally, the participants were invited to a grant writing training session moderated by Prof. Clive Gray and Michelle Letarte. They were divided into eight groups to prepare sample grant

applications on topics that broadly match their area of research, such as vaccines, HIV co-infections/co-infections, malaria in pregnancy, parasitic infections, pregnancy complications, medicinal plants and immune regulation, cancers and primary immunodeficiencies.

Session 2: Infant immunity and malaria (5th November)

The second session on Tuesday focused on infant immunity and malaria. The first lecture was given by Prof. Kelly McNagny, who discussed the importance of lymphocyte development in neonatal immunity. He particularly pinpointed the risks associated with the neonate's health. Dr. Caroline Dunk followed up by detailing different aspects of the dynamic of immune cells during pregnancy. After a coffee break, Dr. Gatien Lokossou developed more aspects of pregnancy-related diseases. He particularly focused on preeclampsia and its consequences on newborn and infant immunity. The following lecture was given by Dr. Nadine Fievet, who reviewed the particularities of immune responses to malaria parasites during pregnancy. After lunch, Dr. Luc Djogbenou gave his lecture on host susceptibility to malaria. Finally, Prof Adrian Luty delighted the audience with the newest updates on the global effort towards the development of a malaria vaccine. After a coffee break, the eight grant writing groups gathered for their first sharing of ideas and choosing the topics of their grant with two advisors per group. Participants were then convened to the first poster session.

Session 3: Neglected Tropical Diseases/Coinfection/Tolerance (6th November)

The 3rd session on neglected tropical diseases (NTDs), coinfection, and tolerance started with a lecture given by Dr. Manuel Ritter, who provided an insightful update on the current knowledge of how filarial parasites modulate their host immune reactivity. Dr. Ulrich Prodjinotho gave an exhaustive report on how host immune systems are modulated by helminth-induced products. After a coffee break, Dr. Marc Hübner went on with his lecture on co-infections, tolerance, and immunity. He demonstrated how parasite-induced immune tolerance could, under certain conditions, be advantageous for the human host. Prof. Clarissa Perez da Costa then provided the audience with the recently acquired knowledge of schistosome infections and their impact on pregnancy.

After lunch, Dr. Yanet Valdez gave her lecture on commensal-pathogen interactions focusing on the modulation of immune responses. Dr. Stanislas Tomavo then gave exciting insights on the secretion of apical organelle antigens by *Toxoplasma gondii* and how this parasite controls innate and adaptive immunity in humans. Prof. Michelle Letarte closed this lecture series by

developing the role of the TGF-beta superfamily in infections and diseases. After a short break, the participants worked on their grant applications with their advisors.

Session 4: Medicinal plants in global health era/Visit to research centers (7th November)

The 4th session on Medicinal plants in the global health era, opened with a lecture by Prof. Latifou Lagnika who tried to familiarize the audience with the techniques used in ethnobotanical investigations of medical plants for their antimicrobial and antioxidant activities. Prof. Akadiri Yessoufou followed up by presenting the results of his group on the capacity of different medicinal plants extracts to modulate helper T cell responses in experimental rodent diabetes. Dr. Gnatoulma Katawa also presented original data from his lab on the modulation of immune responses by plant extracts in helminth infections. Dr. Tomabu Adjobimey then closed the lecture series of this session by illustrating the importance of infectious diseases and immunity in the global health era. Dr. Adjobimey particularly pinned down the social inequities in health between developing countries and the global south.

After lunch, the participants gathered into a large bus and went on an interesting and informative visit of the Centre d'étude et de Recherche sur le Paludisme Associé à la Grossesse et à l'Enfance (CERPAGE) in Abomey-Calavi.



Prof. Adrian Luty welcoming the participants at CERPAGE

Session 5: Tropical viral infections (8th November)

The 5th session on tropical viral infections started with two combined lectures by Prof. Clive Gray. In his first talk, Prof. Clive Gray exposed different aspects of the cellular immune response in HIV exposed but uninfected infants. In his second lecture, Prof. Gray detailed novel vaccination strategies in children born to HIV infected mothers. After these talks, Prof. Eleanor Fish described the newest advances in the management of Ebola with a particular focus on vaccine development. After these lectures, five selected participants gave short talks on their research topics.

After lunch and a grant writing session, the group went to Ouidah for an informative visit to the Institute of Research and Public Health of the University of Abomey-Calavi. There was then a tour of Ouidah, focusing on the various aspects of the slave route, including the Auction Square, the Tree of Forgetting, the Tree of Return, the Remembrance Memorial and the Gate of No Return, now a UNESCO site. The session was closed after the final poster session by the participants.

The second poster session was held after dinner.

Session 6: Tuberculosis/Coinfection (9th November)

The final session on tuberculosis and coinfection started with Prof. Ridha Barbouche, who gave an exhaustive update on genetic susceptibility in tuberculosis. Prof. Dissou Afolabi then concluded the plenary lectures with an insightful talk on his work and the challenges his group faces toward their goal of tuberculosis elimination in Benin.

The final grant writing session for the various groups took place with a deadline of 1pm to hand over the slide presentations. After lunch, a member of each group presented the grant proposals to the audience. A jury composed of eight faculty asked questions and evaluated all the proposals. The winners were announced at the farewell dinner that evening. Group 6 won the competition with a project utilizing a cell phone-based-multiplex-assay for the simultaneous detection of several infectious diseases.

Certificates of attendance and poster prizes were then distributed and photos taken.

After the item described below, Prof. Kabelitz reminded candidates to complete the online evaluations and officially closed the course.

Launching the Benin Immunology Society

A key goal of ImmunoBenin2019 was to launch a permanent platform to support the development of immunology as a discipline in Benin. Therefore, a constituent general meeting held in parallel from the 7th to the 9th November 2019 at the Benin Diaspora Hotel by Benin immunologists launched the Benin Immunology Society and elected the following executive board with the mission to promote training and research in Immunology in Benin.

- 1- President: Dr. Tomabu Adjobimey
- 2- Vice President: Dr. Gatien Lokossou
- 3- General Secretary: Dr. Leonce Kouakanou
- 4- Vice General Secretary: Ms. Amirath Badarou
- 5- Treasurer: Dr. Tatiana Hountohotegbe
- 6- Communication Secretary: Ms. Déo Gracias Berry
- 7- Education Secretary: Dr. Fabien Prodjinotho

Annex

Poster prize winners

	Name of the presenter	Title of the presentation	Affiliation
1	Kenneth Ssebambulidde	Role of macrophages and cholesterol in <i>E. coli</i> K1-caused neonatal meningitis	Infectious Disease Institute, Makerere University, Uganda
2	Hamtandi Magloire Natama	Determinants of infants' susceptibility to malaria: role of in utero environment and host immunogenic factors	Institut de Recherche en Sciences de la Santé, Nanoro, Burkina Faso
3	Rose Selim	Developing and validating a multiplex bead Assay for detection and quantification of immune responses to Diphtheria, Pertussis, Tetanus, Mumps, Measles, Rubella and Varicella in Kenya	KEMRI Wellcome Trust Kilifi, Kenya
4	Jean Claude Djontu	Association of antibodies to full-length VAR2CSA and DBL-5 Domain with Pregnancy Outcomes in Women after Mass Campaign of Intermittent Preventive Treatment in Etoudi, Cameroon	University of Yaoundé I, Yaoundé, Cameroon
5	Déo Gracias Berry	Quantification of Memory B cells specific to the vaccine antigen in a group of vaccinated nulligravid Beninese women	Centre d'Etude et de Recherche sur le Paludisme Associé à la Grossesse et à l'Enfance (CERPAGE), Cotonou, Benin
6	Sylvester Dassah	Antibody responses against GMZ2 vaccine antigens in relation to risk of malaria in Burkinabe and Ghanaian children	Navrongo Health Research Centre, Navrongo, Ghana

Poster Prize Winners



Prof. Michelle Letarte (center) and Prof. Dieter Kabelitz (right) with the poster prize winners

Official opening ceremony



From left to right: Dr. Tomabu Adjomey (Local Coordinator ImmunoBenin 2019), Prof. Dieter Kabelitz (International coordinator), Dr. Moufoutaou Adjera (Chief of Staff of the University of Abomey-Calavi), Prof. Hounnakpon Yedomonhan (Dean of the Faculty of Science and Technology, University of Abomey-Calavi), Prof. Lamine Baba-Moussa (Deputy Director of the Life Science Doctoral School of the University of Abomey-Calavi)

Keynote Lecture



Group photo with the Benin academic authorities

