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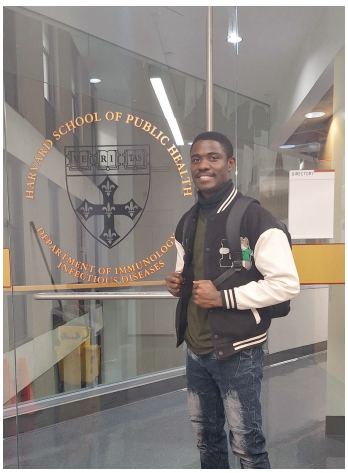
NEWSLETTER

A publication of the Centre for Research in Infectious Diseases, N°016, Fourth quarter, October-December 2024

CAPACITY - BUILDING

Theofelix Tekoh's training in Harvard School of Public Health



Theofelix is a Ph.D student at CRID. He is currently in USA, precisely in the Harvard School of Public Health where he is collaborating with the Catteruccia's lab at the Harvard T.H. Chan School of Public Health. In this frame, he has the privilege to work under the guidance of Prof Flaminia Catteruccia and Dr. Emre Z. Aksoy from the Department of Immunology and Infectious Diseases. Theofelix Tekoh's research focuses on understanding the mechanisms behind insecticide resistance in malaria vectors, using advanced functional genomic tools like CRISPR-based transgenesis. He has successfully generated transgenic mosquito lines expressing a pyrethroid-resistance mutation (E205D) in CYP6P3, a mutation recently identified in *Anopheles gambiae* from Cameroon.

OUR STATISTICS

- 52 Women
- 76 Men
- 44 Students
- 40 Administration
- 17 Technicians
- 27 Scientists

Two women join CRID's board of Trustees

■ During the extraordinary General Assembly held in August 2024, Mrs. Murielle Wondji and Mrs. Falenne Ndi were appointed as members of CRID's board, which until then had consisted solely of men.

This initiative highlights CRID's commitment to promoting gender balance across all levels of management.

Who is Mrs. Murielle Wondji?

Mrs. Murielle Wondji is a qualified Biomedical Scientist who joined Liverpool School of Tropical Medicine (LSTM) as a laboratory technician, department of Vector Biology, in 2015. She soon moved to Cameroon for the establishment of part of Wondji's group laboratory. She has been working as Laboratory manager for CRID where the lab is based since its creation in 2017. She also serves on the Health and Safety Committee at CRID. Her main areas of interest include insecticide resistance, vector-borne diseases, functional genomics, and sequencing. Mrs. Murielle Wondji is a prolific scientist, with several publications in peer-reviewed international journals.

Do you know Mrs. Falenne Yinike Kwalar Ndi?

Mrs Falenne Yinike Kwalar is the Finance Head at CRID with over 7 years of experience in Finance of non-profit Organizations. She is a holder of a Master's degree in Business Administration from Anglia Ruskin University, Peterborough, United Kingdom. She has been charged with different roles at CRID and was successful in all, from being a Finance trainee in 2019 to Finance Officer, later Finance Manager and now Finance Head. Key milestones she has achieved include leading the team at CRID to attain the "Silver status of the Good Financial Grant Practice and the Update of all Finance Policies to International standards" in 2023. She presently oversees over 20 projects.

REJOICING TIME

Fun-filled recreational day

■ On December 20th, 2024, CRID staff enjoyed a fun-filled recreational day from 9 am to 4 pm.

The day kicked off with a variety of sports activities, starting with an exciting football match for the men, while the women participated in a lively fitness session. The turnout was impressive, with many staff members and students joining in, creating a vibrant and energetic atmosphere that encouraged relaxation and strengthened bonds among colleagues. As the morning transitioned into afternoon, the mood lightened even further. The second part of the day was dedicated to celebrating together with delicious food and refreshing drinks. Laughter and music filled the air as everyone danced and enjoyed each other's company. This festive gathering not only provided a break from routine but also marked the beginning of the Christmas season at CRID, fostering a sense of community and joy among all participants.

FAREWELL

Drs Jonas Kengne and Francine Sado went for Postdoc in US

It was on Friday 22nd October 2024. CRID staff said goodbye to their fellow colleagues. During a brief ceremony organised for the occasion, Drs Jonas Kengne and Francine Sado expressed their gratitude to the whole team and particularly to the top management for their support. As postdocs, they really gained in experience and research during their stay at CRID. They appreciated the institution as being a rigorous and nurturing environment. Their peers testified that collaboration with them during these numerous years was a real pleasure. They will be travelling for the US, where they have obtained Posdocs positions at the University of Florida.

VISIT

Dr. Sarah Zohdy was hosted by CRID

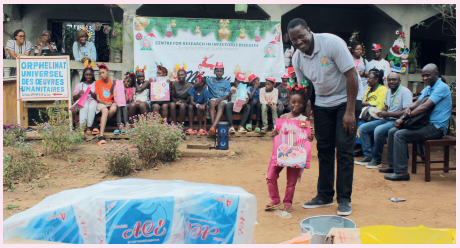
On October 14th 2024, Dr. Sarah Zohdy, the US President's Malaria Initiative (PMI) Entomology team lead and *Anopheles stephensi* Response lead visited CRID. She was accompanied by Dr. Judith Hedje from the Centers for Disease Control and Prevention (CDC). They were received by Dr. Magellan Tchouakui, Principal Investigator (PI), alongside Mrs Murielle Wondji, Laboratory manager, and various key researchers at CRID. During their stay, the ladies had the opportunity to discuss different projects implemented at CRID under CDC, and particularly those concerning *Anopheles stephensi*. After this work session, they toured the institution's laboratories and insectaries, and returned satisfied of what they had seen.

Few days after their tour of CRID, Dr. Sarah Zohdy and Dr. Judith Hedje visited the institution's experimental hut station at Elende located behind the Nsimalen airport. They were accompanied by Dr. Tchouakui Magellan and some CRID personnel.

Students from the University of Tübingen tour CRID

On Friday, November 29th, 2024, CRID welcomed seven Master students in Infectious Biology and Control at Center of Medical Research Lambaréné (CERMEL) in Gabon. This course is part of the Central African Infectious Diseases and Epidemics Research Alliance (CAIDERA) program offered by the University of Tübingen in Germany. The visit, led by Mrs. Murielle Wondji, Laboratory manager at CRID, included diverse nationalities. Mr. Williams Tchapga, CRID's Insectary manager, was among the group. The students expressed their admiration for CRID's state-of-the-art facilities and advanced equipment, which support innovative research in infectious diseases.

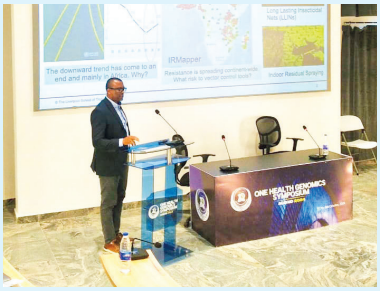
CRID brings joy to orphans in Mfou



Thursday, December 19th 2024. CRID staff, constituted of approximatively 50 individuals visited the "Orphelinat universel des œuvres humanitaires" situated at Abang Nkongoa, Mfou. The event was part of the organization's end-of-year festivities. During the visit, staff had the opportunity to discuss, sing and dance with children. Each orphans received a personnalised Christmas gift. Visibly, this brought great joy in their hearts. Mrs Regine Ella Zam Evina, orphanage manager expressed her gratitude to CRID for coming and for this very kind attention. She said all the gifts brought will be of great help to take care of the 18 children in her charge. CRID's donations consisted of: bags of rice, cartons of soap, toilet paper, milk, butter and chocolate, as well as firewood.

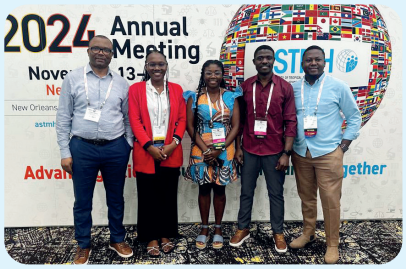
EVENTS

Prof Charles Wondji at One Health Genomics International Symposium 2024



The symposium took place October 7th to 9th, 2024 in Ede, Nigeria. The aim was to celebrate 10 years of African excellence in genomics and public health, with the African Centre of Excellence for Genomics of Infectious Disease (ACEGID). It featured keynote speakers, poster presentations, and breakout discussion sessions. On Day 2, CRID's Executive Director made a presentation titled: « Genomic factors allowing Malaria vectors to survive exposure to insecticide-treated nets». Here, he showed the genetic basis of insecticide resistance in African Malaria vectors, and its impact on control tools.

CRID represented at ASTMH



The 2024 annual meeting of the American Society of Tropical Medicine (ASTMH) was held in New Orleans, United States from November 13th – 17th, 2024. A delegation from CRID was present. It was an opportunity to learn the latest advancements made in tropical medicine, and an excellent venue to exchange research findings with other participants. CRID also contributed to showcase the innovations made in the domain through Nelly Tatchou, a Ph.D student at CRID. She presented her work on "The molecular basis of Pyrethroid resistance in *Anopheles funestus* from western Africa". Her mate Marilene Ambadiang presented on «The ability of *Anopheles gambiae* larvae to survive in the presence of lethal doses of clothianidin, imidacloprid and acetamiprid which is consistent with cross-resistance to neonicotinoids'', and the Principal investigator Dr. Tchouakui presented on "The genomic and transcriptomic signatures of chlorfenapyr resistance in the primary African malaria vector *Anopheles gambiae*". The team was led by CRID's Executive Director, Prof Charles Wondji.

ACoMVeC annual scientific meeting was a success

On November 4th, 2024, the 2nd African Consortium in Modeling for Effective Vector Control (ACoMVeC) annual meeting was held in Uganda. It opened with a welcome speech by Prof Charles Wondji, Principal Investigator of the ACoMVeC project. The agenda continued with a recall of the project's objectives and activities. This meeting was the occasion to evaluate research carried out during the year. For that occasion, the floor was given to postdocs for an overview and progress of their research activities. Here the speakers were Dr Yimga Michele, Dr. William Kuipou and Dr. Luther Manyombe, all from CRID. The rest of the programme was dedicated to the progress of various Ph.D presentations, totalling 16.

ACOMVEC student training workshop was hosted by the Uganda Virus Research Institute in Entebbe. It took place from November 5th- 6th, 2024. Ph.D students from Cameroon, Malawi, Uganda, Burkina Faso, Senegal, RDC, Ghana and Tanzania took part in this training session. Participants had courses on « How to write an infectious disease modelling Ph.D; Heterogeneity; Stochasticity; Uncertainty; Modelling and policy; Grant Writing and Dynamic System analysis Tools ». Several renowned trainers such as Prof Thomas Churcher and Prof Wondji Charles were present.

TRAINING

LSTM trained CRID administration staff

This Research Administration and Management Programme (RAMP) session organised by the Liverpool School of Tropical Medicine (LSTM) was held in Yaoundé from October 28th to 30th, 2024. The participants of this workshop were 22 administration staff from CRID and 02 from the Centre for Sex Health and HIV AIDS Research (CESHHAR) in Zimbabwe. The training course was structured in three main chapters: Project management, Finance and Administration. It was facilitated by a team of experts namely: Martina Savio, Ann Marie Hand and Eunice Ngundo from LSTM, accompanied by Melissa Kwenkeu from the Douala General hospital, who was participating in the Training of trainers' programme. At the end, participants received certificates, evidence of the notions they had acquired through-out the training.

WORKSHOP

ACoMVeC's students attended an international workshop

From December 2nd to 13th , 2024, the International Centre for Mathematical Sciences (ICMS) in Edinburgh, United Kingdom, hosted the "3MC+PIMS+ICMS Winter School on Multiscale Modeling: Infectious Diseases, Cancer, and Treatments". Franck J. Dongmo and Eunice Ayo, both Ph.D students from African Consortium in Modeling for Effective Vector Control (ACoMVeC), attended the workshop. This program aimed at promoting mathematical education and collaboration on building connections between researchers communities and the usage of mathematical modeling to address biomedical challenges, particularly in the African context. As other Participants students from came to gain valuable skills and experience, contributing to the global effort to enhance mathematical competence and diversity. Franck J. Dongmo is working on the project of vaccination schemes for epidemic spread within households, while Eunice Ayo is focusing on within-host infectious disease modeling.

This workshop fosters collaborative learning through six research projects, having to do with the practical application of modeling to real-world problems, with the dual objectives of generating scientific outcomes and strengthening the capacities of African institutions.

GRANTS

CRID awarded $5.5 million from Gates Foundation to set up a vector genomics hub

It is a 3-year project named Africa Centre for Vector Genomic (AVecGen), aiming to set up the first Sub-saharian African Centre focussed on the study of Vector Genomics.

This project is funded by the Bill & Melinda Gates Foundation to the amount of $5,5 million, and it's set up will be done from 2024-2027. It will help generate genetic information on key aspects of vectors supporting the implementation of evidence-based vector control interventions in Africa.

The project is allocated to CRID with a collaboration and support from the Liverpool School of Tropical Medicine (LSTM) in UK and Malaria Genomic Epidemiology Network (MalariaGEN). CRID's executive director, Prof. Charles Wondji is the Principal Investigator (PI) of the AVecGen project. He will be assisted by talented scientists at CRID to deliver this programme. This transformative initiative aims to establish CRID as a regional hub for malaria vector genomics and bioinformatics, leveraging cutting-edge genomic technologies to combat malaria across Africa.

A CRID researcher among winners of TWAS-UNESCO 2024

Judith Dandi, researcher at CRID has received a two-year grant of $30,000, approximatively 18,895,221.60 Xaf francs from TWAS-UNESCO 2024 to conduct a project titled: "Impact of Ace-1 Alleles and Copy Number Variation on Organophosphate Resistance in *Anopheles gambiae* from Central Africa Using Long-Read Sequencing (MinIon)." The findings from this research could provide insights into the development and spread of insecticide resistance, thereby aiding efforts to save lives from malaria transmission.

DEFENSE

Yvan Fotso defends his Ph.D thesis with distinction

Yvan Fotso Toguem, Ph.D student from CRID successfully defended his thesis on December 9th, 2024, at the University of Yaoundé I. As a student in the Department of Animal Biology and Physiology at the Faculty of Science, his research was titled: "Detection of molecular markers of metabolic resistance to pyrethroids in malaria vectors in Yaoundé, Cameroon." His study, accepted by the jury was supervised by professors Njiokou Flobert, Wondji Charles and Dr. Billy Tene. His work was conducted under a project funded by CICRF(UK). Yvan Fotso benefited from the expertise of researchers and resources at CRID throughout his research. The defense jury, chaired by Professor Fomena Abraham, awarded him the highest distinction.

Bertrand Mbakam received an A grade for his Master defense

His study highlights increasing pyrethoid resistance in Anopheles Coluzzii in Cameroon, thereby making the country eligible for high-tech mosquito nets.

On Thursday, December 12th, at the Faculty of Science of the University of Yaoundé I (UYI), CRID's Research assistant Bertrand Mbakam presented his Master's dissertation in Biochemistry, specializing in Biotechnology and Development. His study was entitled: "Role of New VGSC Mutations V4O2L and I1527Y in Pyrethroid Resistance in *Anopheles Coluzzi* in Cameroon." Mbakam's work was supervised by Prof Mbacham Wilfried from University of Yaoundé I (UYI) and Prof Wondji Charles from the Liverpool School of Tropical Medicine (LSTM). Bertrand Mbakam research was well received by the jury, presided over by Prof Penlap Véronique from UY I and examinator Prof Djuidje Marceline. At the end of the day, Bertrand Mbakam received an A grade for his defense.

Nouage Lynda defends her Ph.D thesis

Yaoundé, Friday, December 13th, 2024. Djounkwa Nouage Lynda, a student from the Department of Animal Biology and Physiology at the Faculty of Science of the University of Yaoundé I (UYI), faced the jury in order to defend her Ph.D thesis.

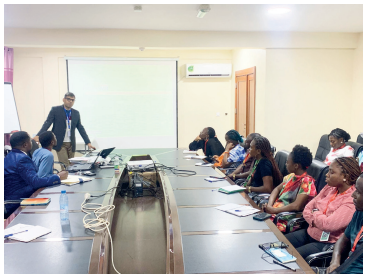
Her research focused on the theme: "Impact of insecticide resistance on the composition of salivary proteins (Sialome) and its consequences on vector capacity in *Anopheles funestus* Giles, 1900 (Diptera: Culicidae), a major malaria vector in Cameroon." Nouage Lynda's research was carried out under the Wellcome Trust project awarded to Dr. Elanga Emmanuel. She was supervised by Prof Wondji Charles from the Liverpool School of Tropical Medicine (LSTM) and Prof Kekeunou Sevilor from UYI. She presented her research findings before a highly qualified jury composed of six university lecturers, chaired by Prof Njiokou Flobert. The scientific value of her study was recognized and validated by the jury. Djounkwa Nouage Lynda's work received the highest distinction.

Highest distinction for Nkodo Carine's Master defense

Nkodo Ndjebakal Carine defended her Master's dissertation on December, 16th, 2024 at the Faculty of Science of the University of Yaoundé I (UYI). Her research topic was " Parasitological and entomological studies of malaria transmission in some localities in the Centre region of Cameroon". In her work, she revealed that malaria prevalence (44.3% by microscopy and 50% by rapid diagnosis tests) remains high in the surveyed localities despite efforts deployed for its control. Following her conclusion, she suggested the National Malaria Control Programme (NMCP) to change the type of insecticide-treated nets to be distributed in these localities during next mass distribution campaigns. Nkodo Carine's research was supervised by Prof Cyrille Ndo, Lecturer at the University of Douala and Head of Parasitology and Microbiology Department at CRID and Prof Njiokou Flobert from UYI

COLLABORATION

Dr. Rajas Warke of HiMedia laboratories interacted with CRID researchers



Yaoundé, Thursday, December 12th, 2024. Researchers at CRID were delighted to host Dr. Rajas Warke, Director of Research and Development at HiMedia Laboratories. As expert in molecular biology and virology, he delivered a presentation focusing on HiMedia's innovative solutions for combating diseases such as dengue, chikungunya, Zika, and malaria. He presented the company's advancements in genomics technologies, including nanopore technology. Following his talk, he engaged the audience in a 10-minute question and answer session. This interaction provided a valuable opportunity to explore potential future projects and collaborations between CRID and HiMedia Laboratories which is a Bioscience company headquartered in Mumbai, Maharashtra, India. Established 50 years ago, and considered as one of the most prominent biosciences companies across the world, with a presence in more than 150 countries.

CRID's team attend RAFT annual scientific meeting in Thailand

From November 25th to 29th, Dr. Basile Kamgang, Head of the Medical Entomology Department at CRID, and Dr. Yvan Fotso Toguem, Postdoc attended the 3rd Resilience Against Future Threats (RAFT) Annual Scientific Meeting (ASM) in Bangkok, Thailand. They noted that the meeting was a great chance for face-to-face connections, reviewing progress, and planning for years 5 and 6. A key goal of the meeting was to enhance collaboration within the consortium to tackle emerging health threats through vector control and to share experiences among stakeholders.

AWARDS

A new award for Sonia Ngongang

Research Assistant at CRID, she achieved an impressive milestone during the inaugural Day of the Young Scientific Community at the CPC on December 17th, 2024.

The initiative was led by Centre Pasteur of Cameroon (CPC)'s director, Dr. Mirdad Kazanji and implemented by Dr. Sara Irène Eyangoh, Scientific Director, alongside her team. It was an event focused on providing advice and tips for succeeding in a research career. In addition to this, a competition was organized for young students pursuing research careers and enrolled in doctoral programs at various state universities.

A total of eight young researchers from CRID competed by presenting their thesis topics in 180 seconds. Sonia Ngongang from CRID and Ibrahima Ibrahima from the CPC were ranked first and first equal respectively, in the flash presentation category.

SCIENTIFICS PUBLICATIONS

Carlos S. Djoko Tagne, Mersimine F.M. Kouamo, Magellan Tchouakui , Abdullahi Muhammad, Leon J.L. Mugenzi, Nelly M.T. Tatchou-Nebangwa, Riccado F. Thiomela ,Mahamat Gadji, Murielle J. Wondji, Jack Hearn, Mbouobda H. Desire, Sulaiman S.Ibrahim, Charles S. Wondji. **A single mutation G454A in the P450 CYP9K1 drives pyrethroid resistance in the major malaria vector *Anopheles funestus* reducing bed net efficacy**. *Genetics, iyae181,07 November 2024.https://doi.org/10.1093/genetics/iyae181.*

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Dossou C, Tchigossou G, Koto M, Atoyebi SM, Tossou E, Adanzounon D, Ateutchia Ngouanet S, Sina H, Djègbè I, Gbankoto A, Wondji C, Djouaka R. **Organophosphate and carbamate susceptibility profiling of *Anopheles gambiae* sl. across different ecosystems in southern Benin**. *Wellcome Open Res. 2024 Nov 14;9:424.https://doi.org/10.12688/wellcomeopenres.21452.2.*

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Franck J. Dongmo, Charles S. Wondji, Berge Tsanou and Ramsès Djidjou-Demasse. **Quantifying ivermectin's optimal strategy impacts on malaria transmission: a dual-structured mathematical model**. *Applicable Analysis. Published online: 27 Nov 2024. https://doi.org/10.1080/00036811.2024.2429103.*