We wish you a happy & healthy 2023, filled with many successful projects!

One new member joined the GABRIEL network at the end of the year: the Congolese Foundation for Medical Research (FCRM), Republic of the Congo.

This institution will make it possible to strengthen the presence of the GABRIEL network in Africa by bring new skills to strengthen our research activities and public health.

You can find out more about this new member in the article below:

Presentation of the Congolese Foundation for Medical Research (FCRM), Republic of the Congo

The Congolese Foundation for Medical Research (FCRM) (www.fcrm-congo.com) was created as a legal entity in 2008 to solve the issue of the limited number of Congolese scientists carrying out health research activities in the Republic of the Congo. The FCRM is an independent non-governmental institution. The Foundation has signed a collaboration agreement with the Congolese Ministry of Public Health and Science and Technology, and Marien Ngouabi University.

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The Foundation raises funds through grants and donations in order to achieve its objectives. The FCRM serves to further strengthen collaboration between academic, research and health institutions in the Republic of the Congo and promotes public and private sector support for health research in the country. To achieve this, partnership agreements have been signed with the Ministry of Public Health, the Ministry of Science and Technology and the Marien Ngouabi University, the country’s state-funded institution.

At the regional level, the FCRM coordinates the Central African Clinical Research Network (CANTAM) which aims to develop clinical research capacities on infectious and tropical diseases, as well as the PANDORA-ID-net consortium which aims to strengthen its partners to ensure rapid responses and preparedness to infectious disease outbreaks in Africa.

Three facilities host FCRM’s activities: the Christophe Mérieux infectious disease research centre with its molecular biology, immunology and cellular laboratories, a 3D printing laboratory and a parasitology laboratory, a health facility comprising a clinical research laboratory, and an administrative and financial unit.

The FCRM’s activities are focused on:

- Bacterial and viral diarrheal infections;
- Sickle-cell disease and malaria;
- Emerging and re-emerging infections (Chikungunya, Ebola, dengue, etc.);
- Immunological responses to identified pathogens;
- Antimicrobial resistance;
- Studies related to co-infections.

The FCRM benefits from a long-standing collaboration with the Institute of Tropical Medicine (University of Tübingen, Germany), which serves as a training centre for Congolese MSc and PhD students. Celebrating its 15th anniversary in 2023, the FCRM has a long history of building health research capacity in sub-Saharan Africa and has been committed for several years to promoting gender equality in science in the Republic of the Congo and the abroad thanks to an extensive awareness program entitled “Women & Science”.

The FCRM has established a publication history in many peer-reviewed journals, such as *The Lancet, Nature, Science, The Lancet Infectious Diseases, Nature Microbiology* (https://www.fcrm-congo.com/publications).

Francine Ntoumi, the Congolese Foundation for Medical Research, Republic of the Congo

Screening of SARS-COV2 variants

As part of the effort to combat COVID-19, five members of the GABRIEL network, the Charles Mérieux Center for Infectious Disease (CICM) in Madagascar, the Rodolphe Mérieux Laboratory in Lebanon, the BITID and ideSHi, in Bangladesh, and Centre Pasteur Cameroon (CPC) in Yaoundé, received funding to purchase...
PCR screening kits for SARS-CoV-2 variants, and obtained support to select screening methods and interpret data for variant identification. The choice of screening methods was made between commercial kits from Thermo-Fisher, SNPsig® EscapePLEX™, TIB, and Sanger sequencing, with different targets and combinations on the S gene. Laboratory personnel from the five GABRIEL network members, skilled in detecting variants, were able to identify several hundred VOCs and VOIs during the 2021-2022 epidemic. In fact, ideSHi was the first laboratory to identify the Omicron BA.2 variant in Bangladesh. (c.f. Bin Manjur OH, et al. Genome Sequences of 25 SARS-CoV-2 Sublineage B.1.1.529 Omicron Strains in Bangladesh. Microbiol Resour Announc. 2022 Apr 21;11(4):e0011922.)

This initiative, along with the technical skills required, has given some of the laboratories the opportunity to participate in their respective national surveillance systems. The laboratory data that they have obtained will be able to be transmitted to the relevant authorities in the national ministries of health and used to decide on non-therapeutic health measures to be applied.

Zannat Kawser, Tanbir Habib, Hassan Afrad, Mohabbat Hossain, Omar Hamza, Nishat Sultana, Saikt Rahman, Firdausi Qadri, institute for developing Science & Health initiatives (ideSHi), Bangladesh
Zahirul Islam, Rakib Hassan, Shakeel Ahmed, Bangladesh Institute of Tropical and Infectious Diseases (BITID), Bangladesh
Luc Hervé Samison, Luca Maharavo, Felana Ranaivo Rabetokotany, Mandranto Rasamoelina, Centre of Infectiology Charles Mérieux, Madagascar
Marianne Antar, Marianne Abifadel, Rodolphe Mérieux Laboratory, Lebanon and Josette Najjar, Mérieux Foundation, Lebanon
Ronald Perraut, Richard Njouom, Centre Pasteur of Cameroon
Jean-Luc Berland, Emilie Westeel, Florence Pradel, Mérieux Foundation, France

First French-speaking African Forum on the management of tuberculosis infection

In its new strategy to end TB, the World Health Organization (WHO) challenges all countries to dramatically scale up their efforts to achieve bold new targets of a 95% reduction in tuberculosis deaths worldwide and a 90% reduction (<10 cases per 100,000 population) by 2035.

It is in this context that the First Francophone Africa Forum on the Management of Tuberculosis Infection (IT) was held in Yaoundé on 27-28 September 2022. This event brought together the heads of National
TB control programs and/or the IT focal point or the head of the National Reference Laboratory for TB from 11 French-speaking African countries: Benin, Burkina Faso, Cameroon (host country), Republic of the Congo, Côte d’Ivoire, Gabon, Guinea, Madagascar, Democratic Republic of the Congo, Senegal and Togo.

This workshop, co-organized by the Centre Pasteur of Cameroon (CPC) and the Mérieux Foundation with the support of QIAGEN, had as its central question: What prevention strategies to accelerate the elimination of TB in Africa?

The overall objective of this workshop was to create a platform for discussion and exchange with stakeholders concerned with the implementation of WHO recommendations on community-based intervention, IT screening and TB preventive treatment among at-risk groups. The workshop provided an opportunity for NTP members to learn more about the available tests and treatment regimens for IT and to review current practices in African countries on this topic so that they can identify strategies that are appropriate for their socio-economic context. A roundtable discussion was held to discuss sources of operational funding to support countries in implementing new strategies for the screening and management of IT.

Sara Eyangoh, Valérie Donkeng, Centre Pasteur of Cameroon
Laurent Raskine, Koren Wolman-Tardy, Jonathan Hoffmann, Mérieux Foundation

Strengthening Data Science Capacity and the Ecosystem: AMR Data Center in Madagascar and Burkina Faso

Antimicrobial resistance (AMR) is a worldwide threat, and data-centered public health interventions are one of the WHO action plan pillars to fight it. Building up on passive surveillance as the cornerstone of all national action plans through regular collection of AMR data during diagnosis, two partners of the international GABRIEL network, the Charles Mérieux Center for Infectious Disease (CICM) – University of Antananarivo in Madagascar and Souro Sanou University Hospital, in Burkina Faso, have been also implementing active surveillance through the WHO “tricycle” protocol, with the support of the Mérieux Foundation. However, there are still drastic gaps to achieve a data-centred surveillance and efficient data governance in both countries to provide evidence-based data supporting actively stakeholders and policy makers in adjusting national action plans.

Some existing standardized collection and analysis tools which have been developed e.g. Whonet and the GLASS system, are a pillar for passive surveillance but not adapted to collect other data (e.g. sequencing data) in the context of active surveillance. This active
surveillance is faced to (i) non-use of efficient electronic data collection tools – without standards not reaching sufficient quality (duplicates, incomplete data, entry errors…), (ii) non-standardized passive surveillance and research data collected leading to lack of sharing, (iii) lack of experienced personnel for advanced statistics inducing delays on providing strategic indicators, (iv) weak culture of evidence-based decision making among data governance stakeholders and (v) poor-evidence for decision makers.

To fill in these gaps, Charles Mérieux Center for Infectious Diseases, University of Antananarivo and Souro Sanou University Hospital, with the Mérieux Foundation have been granted for 2 years, by the Bill and Melinda Gates Foundation under the Grand Challenges 2022. This collaborative project will strengthen active surveillance in both Madagascar & Burkina Faso by building up a data science center with robust tools for collection, data analysis and dissemination from this active surveillance. In addition, the Mérieux Foundation will guarantee the sharing of data to the wider community between its partners based in the LMICs to build upon their capacities in the AMR data center. This project is considered as a pilot project on the emergence of an AMR data center for active surveillance. It integrates 3 innovative processes: (i) the use of electronic data collection tools, (ii) the implementation of the Clinical Data Interchange Standards Consortium (CDISC) standards, (iii) the use of the Staged Development Tool (SDT) for the improvement of the culture of evidence-based decision making among data governance stakeholders. The concept of robust and validated data process on active surveillance in One Health approach – through ESBL *Escherichia Coli* surveillance - could be applied to other types of monitoring and research such as TRiUMPH in Madagascar and FASO-RAM in Burkina Faso, already financed and in ongoing implementation. This approach built with and for policy makers, will contribute to a more responsive and resilient surveillance system.

Luc Hervé Samison, Charles Mérieux Center for Infectious Diseases, Madagascar  
Kabore Odilon, Abdoul Salam Ouedraogo, CHU Souro Sanou, Burkina Faso  
Isidore Traore, Université Nazi Boni, Burkina Faso  
Laurence Mazuranok, Florence Pradel, Mérieux Foundation

**Fighting pneumonia: an agenda for action**

Pneumonia is the leading infectious disease killer in the world, claiming the lives of an estimated 2.5 million people in 2019, including 672,000 children under five and 1.2 million adults over 70 years, according to the Global Burden of Disease. The COVID-19 pandemic has increased the burden of respiratory infection deaths to more than 6
million in 2021.

Urgent action is needed to both reduce the massive burden of sickness and death from pneumonia and reduce the risk that future respiratory pandemics will kill millions more.

For World Pneumonia Day, the Mérieux Foundation and Every Breath Counts Coalition joined forces to host a critical conversation on what governments and international agencies must do to reduce pneumonia deaths and the risk of future respiratory pandemics. Renown experts in the Protect, Prevent, Diagnose and Treat axes of the Global Action Plan on Pneumonia presented insightful perspectives on how to tackle pneumonia particularly in low resource settings.

Understanding that pneumonia awareness needs to be addressed from all ends, the Mérieux Foundation and Every Breath Counts Coalition also supported Community country-based activities, through its eleven NGOs Small Award Grants Winners that carried small scale projects, during October and November of the present year, promoting and building Pneumonia awareness to the large public.

Valentina Picot, Mérieux Foundation
Leith Greenslade, Every Breath Counts Coalition

Sequencing *M.leprae* strains at CICM, Madagascar

In November 2022, two Illumina Iseq 100 sequencer systems were installed at the Charles Mérieux Center for Infectious Disease (CICM) in Madagascar. The Centre’s staff have received training in the chemistry of sequencing and the analysis of the data derived from the system.

This offers the center interesting prospects in genomics and epidemiology. The technology of the sequencers will be of great value for the CICM in its work on leprosy, especially considering that it oversees the monitoring of resistance to anti-leprosy drugs in the Analamanga region of Madagascar. As the mycobacterium’s resistance to antibiotics is triggered by point mutations on certain genes, sequencing is the appropriate technique for scanning the causative genes, especially fop1, rpoB, and gyrA. In addition, the mutations carried by the remaining genome should help define the genotype of various *M. leprae* strains circulating in the country. According to recent work carried out in collaboration with the CICM, the genotype of most strains is specific to Madagascar, e.g., genotype 1D-malagasy belongs to branch 1 (Avanzi et al, 2020). The ability to compare the genomes of *M. leprae* strains should make it possible to examine the genetic diversity of the strains in the country and the factors that influence patient transmission.

Jean-Luc Berland, Mérieux Foundation
Training in bioinformatics analyses of next-generation sequencing data for the characterization of bacterial isolates

A bioinformatics course organized by the Mérieux Foundation in collaboration with ANSES was held in Dakar, Senegal, from 5 to 9 December 2022. Eighty candidates from 15 African countries submitted applications to attend this professional training course, which had received an Illumina educational grant. Of the 23 applicants who were interviewed, ten were selected, coming from eight countries (Benin, Burkina Faso, Cameroon, Ivory Coast, Gabon, Democratic Republic of the Congo, Senegal, and Togo). The course dealt with the bioinformatics analysis of next-generation sequencing data for the characterization of bacterial isolates.

During the course, the participants acquired the basic knowledge in bioinformatics needed to interpret their own data sets starting from the raw information they had collected, working their way up to specific gene identification. Bioinformatics were taught in workshops with the use of teaching aids (puzzles, board games, etc.) together with theoretical and hands-on computer coursework.

Each participant’s progress was gauged through pre- and post-training assessments. They each expressed their desire to learn more about the material taught in the course during a follow-up session, as they felt that five days of coursework had been insufficient to cover all the concepts.

The excellent feedback and the notable progress of each participant suggest that offering the course over the long term for as many people as possible in the future would be extremely beneficial.

Pauline François, ANSES
Emilie Westeel, Mérieux Foundation

GABRIEL member publications since July 2022

Collaborative publications


Ndiaye MDB, Ranaivomanana P, Rasoloharimanana LT,


Other publications


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