

Mérieux Foundation 50th Anniversary

Programs related to the round table topics

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Les Pensières Center for Global Health, Veyrier-du-Lac - Annecy

Fondation Christophe et Rodolphe Mérieux works side by side with the Mérieux Foundation in the field to fight infectious diseases



Before RESAOLAB, no regional program covering West Africa has targeted capacity building for medical biology testing. A clinical biology system that provides high-quality services is essential to improve public health, yet diagnostics is the field that has received the least multilateral aid and government funding.



The West African Network of Biomedical Analysis Laboratories (RESAOLAB) is the first regional program in West Africa to respond to this public health challenge. Designed in collaboration with West African health professionals and the health ministries of member countries, it addresses all factors affecting how the governance and performance of laboratories. RESAOLAB is part of the regional health policy established by the West African Health Organization (WAHO).

Initiated by the Mérieux Foundation in 2009, RESAOLAB has 7 member countries today: Benin, Burkina Faso, Guinea, Mali, Niger, Senegal and Togo.

▪ Objectives

Developed with the ministries of health of its seven member countries, RESAOLAB focuses on 6 key areas :

- improving laboratory services through implementation of a standardized quality system,
- strengthening both initial and continuing training of laboratory staff,
- establishing an information management system in the network's main laboratories,
- strengthening the national laboratory procurement, maintenance and management systems through a regional approach,
- obtaining additional funding for the laboratory systems,
- strengthening regional and national governance of the laboratory systems.

▪ Achievements

Since it was created in 2009, RESAOLAB has paved the way for important programs on continuous training, the construction and equipment of training and quality control laboratories, epidemiological surveillance tools, and an inter-country network.

- Over 1,000 public and private laboratories brought into the network in the 7 member countries
- More than 700 laboratories supervised
- Over 1,000 laboratory technicians trained during 100 training sessions
- 45 laboratories equipped with a Laboratory Information Management System (LIMS) to support epidemiological surveillance
- 14 training modules as part of a skills development program
- 20 continuous training centers built
- Over 200 laboratories with an external quality assessment program



▪ Why is RESAOLAB essential ?

The right treatment depends on the right diagnosis !

In West Africa, laboratories lack the resources that clinicians need to provide reliable diagnoses. This has serious implications on public health. For example, when patients present a high fever in health centers, they are given antimalarial drugs when only 50% of fevers in Africa are caused by malaria. The systematic administration of chloroquine has contributed to the resistance to treatment by the *Plasmodia* (parasites which cause malaria).

A clinical biology system that provides high-quality services is essential to improve public health and monitor epidemics. This goes beyond infectious diseases. Certain conditions such as diabetes or high blood pressure are rarely diagnosed or poorly diagnosed and patients are not given the treatment that would reduce the rate of mortality.

What caused this situation?

- There is a lack of clinical biologists able to interpret test results that can help doctors choose the best course of treatment.
- Many laboratories are insufficiently equipped or lack the material and maintenance needed to operate.
- Few technicians are trained.
- There is little initial training in biology or continuous training for laboratory managers and technicians, while the field of clinical biology is constantly changing.
- The development of quality systems is just beginning and mostly addresses HIV/AIDS and tuberculosis.
- There is no quality assurance to evaluate the reliability of testing results.
- National networks and laboratory policies are lacking.

RESAOLAB is emblematic of the Mérieux Foundation's approach to fighting infectious disease through networks. The foundation programs bring together health authorities, public and private academic research bodies, international organizations, governments, development banks, foundations, NGOs and the healthcare industry.

▪ **Partners**

Operational

- Health Ministries of Benin, Burkina Faso, Guinea, Mali, Niger, Senegal and Togo;
- West African Health Organization (WAHO);
- WHO-AFRO

Financial

- Agence Française de Développement;
- Department of International Cooperation of the Principality of Monaco;
- Islamic Development Bank;
- Mérieux Foundation;
- Stavros Niarchos Foundation.



STRENGTHENING GLOBAL SURVEILLANCE CAPACITY

Diagnostics are essential for epidemiological surveillance and a major aspect of WHO's International Health Regulations (IHR), which aim to prevent acute public health risks.



After the West African Ebola outbreak in 2014, **strengthening global surveillance capacities have become the priority of the Global Health Security Agenda (GHSA)**. Within this framework, major funding and requests for proposals have been issued by the US Centers for Disease Control and Prevention and USAID (United States Agency for International Development). Several Mérieux Foundation projects have received funding from the GHSA, particularly in Mali and Senegal.

▪ Secure sample transport

A critical link in the diagnostic chain, the transportation of potentially pathogenic samples is a regulated activity that must be carried out in strict biosecurity conditions. The Mérieux Foundation works to help health authorities set up secure processes, and offer a range of courses and awareness raising programs. These span the logistical management of samples, handling techniques, safe destruction and storage of samples, as well as prevention and safety for laboratory staff.

In 2014, through the RESAOLAB network, the Mérieux Foundation provided secure sampling kits, and training in how to use them, to certain West African countries affected by the Ebola epidemic, as well as in bordering countries. Personal protective equipment (safety suits, gloves, visors, and masks) were also provided. A free system for shipping samples to the BSL4 Jean Mérieux-Inserm Laboratory in Lyon was set up for countries which could not perform Ebola screening locally.

▪ Mobile laboratory / G5 Sahel

The crisis caused by Ebola virus disease showed that Mali and the broader Sahel region are exposed to the threat of outbreaks of highly pathogenic diseases and their potentially serious consequences on the safety and security of the local population.

To screen and diagnose Ebola virus disease as well as other dangerous pathogens, Mali has had a mobile lab in operation since December 2014.

The Charles Mérieux Center for Infectious Disease, a center for training and research, manages the Malian mobile laboratory, with help from its partners and the Mérieux Foundation in particular. The laboratory can be transported by car, helicopter, plane or in back packs to remote regions in the event of epidemics.

Scientists from the G5 Sahel countries (Burkina Faso, Mali, Mauritania, Niger and Chad) have been trained in how to use the equipment so that they can manage the lab themselves. The aim is to consolidate this network through training and conferences in the G5 Sahel countries and ultimately to reinforce the overall security of people in the G5 Sahel, as well as to better equip the countries to combat bioterrorism.

In addition to the GIZ (for its financial support), and the Bundeswehr Institute of Microbiology (for its technical expertise), the Fondation Mérieux is delivering this biosafety project as part of the German Partnership Programme for Excellence in Biological and Health Security from the German Ministry of Foreign Affairs, in partnership with:

- the Charles Mérieux Center for Infectious Disease of Mali,
- the Ministries of Health of Burkina Faso, Chad, Mali, Mauritania, and Niger,
- the Emergency Operations Center,
- the World Health Organization,
- the West African Health Organisation,
- and the Permanent Secretary of the G5 Sahel.



RESEARCH LABORATORIES

Strengthening applied research capacities in developing countries is one of the Mérieux Foundation's main objectives. The Foundation does this by training local research teams, establishing collaborative research programs and creating laboratories of excellence – the Rodolphe Mérieux Laboratories – which are transferred to local partners.

The Foundation has collaborative research projects in four main areas that require urgent attention in developing countries: respiratory infections, foodborne (enteric) diseases, emerging diseases, antimicrobial resistance.

Its framework for scientific collaboration draws on the expertise of the Emerging Pathogens Laboratory, which brings together a network of laboratories around the world to foster international collaboration in infectious disease research.

▪ Emerging Pathogens Laboratory



Located in Lyon-Gerland, at the hub for infectious disease research on the Charles Mérieux Campus, our Emerging Pathogens Laboratory conducts research with applications in the fields of global health and infectious diseases that affect vulnerable populations in developing countries and during outbreaks.

▪ P4 Jean Mérieux-Inserm Laboratory

Created by the Mérieux Foundation in 1999, and placed under Inserm's responsibility in 2005, the P4 Jean Mérieux-Inserm Laboratory in Lyon is a high-security unit exclusively focused on class 4 pathogen research.

There are only about 40 such laboratories operating in the world, mostly in the United States. It is the only BSL4 laboratory in operation in France today.

The P4 Jean Mérieux-Inserm Laboratory is an essential component in the fight against the most virulent infectious diseases. It was in this laboratory that the strain of the Ebola virus responsible for the outbreak in West Africa was first identified and characterized by the Pasteur Institute of Lyon in March 2014.

▪ Rodolphe Mérieux Laboratories

The Rodolphe Mérieux Laboratories of excellence are established in outbreak-prone regions of developing countries, with financial support from Fondation Christophe et Rodolphe Mérieux. As the pillars of the GABRIEL network created by the Mérieux Foundation in 2008, they comply with the highest international standards. With a strong focus on applied research in infectious diseases and epidemiological surveillance, the laboratories are transferred to local partners to ensure they address local needs on a long-term basis. They help strengthen local research and training capacities and provide diagnostic testing in the regions where they are located.



The Rodolphe Mérieux Laboratories pursue a double objective, combining diagnostics and applied research to:

- perform complex medical analyses;
- participate in national and international collaborative research programs, with technical support from the Emerging Pathogens Laboratory in Lyon-Gerland (France).

There are **eight Rodolphe Mérieux Laboratories**, located in Bangladesh, Brazil, Cambodia, Haiti, Laos, Lebanon, Madagascar and Mali. A ninth lab is under construction in Tunisia on the Institut Pasteur campus.



GABRIEL NETWORK

More than 70 scientists working in 16 countries across the globe are collaborating through GABRIEL (Global Approach to Biological Research, Infectious diseases and Epidemics in Low-income countries). This research network was created by the Mérieux Foundation in 2008 to foster international collaboration in infectious disease research.



Centered around the Foundation's two research units in Lyon and Beijing (the Emerging Pathogens Laboratory and the Christophe Mérieux Laboratory), the network brings together the Rodolphe Mérieux Laboratories, local reference laboratories, and representatives from academic and private-sector research, hospitals, and universities in developing countries. Together they conduct research to address local infectious disease threats.

More than 250 scientific articles have been published in peer-reviewed journals by researchers in the GABRIEL network since 2008.

The GABRIEL network has three objectives:

- **Transfer expertise, tools, and knowledge** needed for advanced applied research in emerging countries, particularly in the field of pathogenic agent identification and monitoring
 - **Conduct international, collaborative epidemiological studies** in conjunction with local healthcare stakeholders and diagnostic companies
 - **Help improve public health policies** by providing reliable and accurate epidemiological data
- **Governance**

The GABRIEL network is led by the Emerging Pathogens Laboratory in Lyon, which supports and coordinates research activities. A Steering Committee, chaired by Dr. Jean-William Pape, Director of the GHESKIO Centers in Haiti, supervises the implementation of activities.

19 members in 16 countries:

- **Bangladesh:** International Centre for Diarrheal Disease Research, Bangladesh
- **Bangladesh:** Institute for developing Science and Health initiatives (Laboratoire Rodolphe Mérieux)
- **Brazil:** Instituto Oswaldo Cruz
- **Brazil:** Laboratório Nacional de Computação Científica
- **Brazil:** Fundaç e Hospital in Rio Branco (Rodolphe Mérieux Laboratory)
- **Cambodia:** Faculty of Health Sciences in Phnom Penh (Rodolphe Mérieux Laboratory)
- **Cameroon:** The Pasteur Center of Cameroon
- **China:** Institute of Pathogen Biology & Chinese Academy of Medical Sciences (Christophe Mérieux Laboratory)
- **France:** Emerging Pathogens Laboratory, the Mérieux Foundation
- **Georgia:** National Center for Tuberculosis and Lung Disease
- **Haiti:** GHESKIO Centers (Rodolphe Mérieux Laboratory)
- **India:** King George's Medical University
- **Laos:** Ministry of Health (Rodolphe Mérieux Laboratory)
- **Lebanon:** Saint Joseph University (Rodolphe Mérieux Laboratory)
- **Madagascar:** Antananarivo University (Rodolphe Mérieux Laboratory)
- **Mali:** Charles Mérieux Center for Infectious Disease (Rodolphe Mérieux Laboratory)
- **Mongolia:** Mongolian Academy of Medical Sciences
- **Paraguay:** National University of Asunción
- **Ukraine:** Zaporozhye State Medical University



Encouraging research

- **Christophe Mérieux Prize**

Since 2007, the Fondation Christophe et Rodolphe Mérieux has awarded an annual scientific 'Grand Prize,' called the "Christophe Mérieux Prize" to a researcher or research team studying infectious diseases in a developing country.

The winner is chosen by the Institut de France based on proposals from the Mérieux Foundation, which submits a list of researchers that were identified in the field.

This 500,000 euro prize is designed to support research on infectious disease in developing countries and reward research teams working permanently in these countries.

The 2017 Christophe Mérieux prize was awarded to Serge Eholié and Xavier Anglaret at the Center for Research on Infectious Diseases and Associated Pathologies in Abidjan.



Improving conditions for mothers and children



The Mérieux Foundation firmly believes in the importance of a global strategy for public health, and the need to provide tailor-made responses to address local realities. In the regions where it works, the Foundation is committed to helping the most vulnerable. It has teamed up with a number of NGOs working to improve the lives of mothers and children, especially those who are victims of conflict or natural disaster, to work on projects such as access to healthcare, hygiene, decent housing, education, and employment.

In Haiti

Since the earthquake that hit the country in 2010, the Mérieux Foundation has been assisting with reconstruction efforts and working with the GHESKIO Centers and various local population support facilities (orphanages, professional training center, dispensary, etc.) to fight poverty in Haiti and the devastating effects of natural disasters (the earthquake in 2010, Hurricane Matthew in 2016).

▪ Support to children's home

Communauté de l'Incarnation children's home in Leogane

The Mérieux Foundation supports the development of the institution and works to improve the living conditions of children and staff through the construction of 15 houses, providing access to clean water and better nutrition, but also school supplies, access to healthcare and development of income-generating activities.



Our Lady of the Miraculous Medal children's home in Cap Haitien

This children's home, managed by Sister Godelive, welcomes 500 children in the school renovated in 2011 and close to a hundred residents in the orphanage. Five « Kayiti » houses and a playground were built for the children and the community.

With the support of Fondation Christophe et Rodolphe Mérieux, following projects to increase the capacity and improve the living conditions at the institution, the Mérieux Foundation is providing medical care and food aid.

▪ Micro-credit loan for vulnerable Haitian women living with HIV

This program created in 2005 in partnership with ACME (Haitian cooperative association for microenterprises) and the GHESKIO Centers is to help Haitian women living with HIV or at risk of HIV infection.

Recruited by the GHESKIO Centers, these women are provided with training on managing an income-generating activity and the responsibilities tied to their loan. Since 2005, more than 8,900 loans were granted to more than 4,000 women, and the reimbursement rate is up to 90%. This program is an ongoing success, with an effective economic reintegration of many women.

▪ Support for local organization: Association Klib Timoun Kè Kontan (AKTKK)

The AKTKK association aims to help disadvantaged children by giving them the opportunity to learn a trade (such as baking, embroidery, floral art, crafts). Fondation Christophe et Rodolphe Mérieux supports AKTKK for several years. More than 50 students benefited from these services over the past 3 years.

▪ Strengthening access to healthcare

Created by AAIP (Firefighter's international aid actions) in Jacmel, this medical dispensary works to provide care for vulnerable populations in need of medical treatment (medical consultation, vaccination, pediatric care, etc.). The Mérieux Foundation built three "Kayiti" houses for the dispensary.



In Iraq

The Mérieux Foundation has been involved since the outbreak of the crisis in Iraq and Syria, assisting displaced populations in Iraq and Lebanon as part of initiatives supported by Fondation Christophe et Rodolphe Mérieux: delivering medicines, and building houses and a school. In 2016, the Mérieux Foundation continued to support displaced people in Iraqi Kurdistan, building a health center for mothers and children.

- **Construction of 250 homes for refugees in the Nineveh Plains**

In 2014, the Mérieux Foundation built homes to provide decent housing for more than 1,000 people in partnership with the Saint-Irénée Foundation, the Raoul Follereau Foundation, the Auvergne-Rhône-Alpes Region, Grand Lyon and the City of Lyon.

- **Construction of the Saint-Irénée school for refugee children in Erbil**

In 2015, the three foundations decided to continue their collaborative efforts, this time focusing on education. With additional support from Fondation AnBer and the Auvergne-Rhône-Alpes Region, the Saint-Irénée school was officially opened on June 28, 2015.

The school has 18 classrooms and accommodates around 1,200 pupils each day. Fondation Mérieux drew up the plans and employed people from local IDP camps to help build the school. A sports field was also created close to the school.

- **Construction of the Pauline-Marie Jaricot Mother and Child Center in Erbil**



The medical center with facilitate access to healthcare for displaced persons in the Iraqi Kurdistan region. These populations live in refugee camps, where health issues are common, such as diarrhea or respiratory infections.

The Mérieux Foundation oversaw this project in connection with the refugee camp (with architects and center staff from the camp) and with the financial support of the Pontifical Mission Societies of Lyon and the Saint-Irénée Foundation.

Inaugurated in December 2016, the center has emergency, pediatric, gynecological and dental care units. It is also equipped with a clinical diagnostics laboratory to offer comprehensive, quality medical care.

- **Construction of a medical laboratory**

In 2016, the Foundation built a medical laboratory in the IDP camp in Bardarash, in partnership with the NGO Première Urgence Internationale.

- **Equipment of the Health Center laboratory in the Darkar camp**

Since May 2016, the Darkar camp, (near the Turkish border), housed approximately 4,000 people in 800 emergency prefabricated buildings.

Facing the lack of access to healthcare for these displaced populations, the NGO EliseCare set up a clinic that provides 2,000 treatments per month. The 250 m² clinic consists of 7 consultation rooms: a general practice, an infirmary, a pediatric practice, a gynecological practice, an acupuncture practice for women, an acupuncture practice for men, as well as a laboratory equipped by Mérieux Foundation. The clinic, inaugurated in April 2017, also has a pharmacy and a drug storage room.



In Madagascar

In 2016, the Mérieux Foundation renovated a training center and accommodation for students in Antananarivo: the “Maison Bénédicte”, in memory of Doctor Bénédicte Contamin, the former head of the Mérieux Foundation in Madagascar

The Mérieux Foundation and Fondation Christophe et Rodolphe Mérieux work with several local charities that tackle poverty, including Akamasoa (meaning “good friends”), which provides accommodation, health facilities, schooling and income-producing activities for more than 20,000 people in Antananarivo.

The foundations also contribute to access to medical care via the “Solidarity Fund for Underprivileged Children and Women”, which has so far provided medical care for more than 700 children. A health education program was also established for the most vulnerable families, in partnership with school medical services and child protection associations.

