

2016 ANNUAL REPORT



ROOTS FOR LIFE





Infectious diseases cause 17 million deaths each year around the world, predominantly in developing countries.

For 50 years, the Mérieux Foundation, an independent family foundation, has been taking action to ensure that every man, woman and child has fairer access to essential healthcare.”



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*School children at the Saint-Irénée school,
created in the Erbil refugee camp
(Iraqi Kurdistan) by the Mérieux Foundation
and its partners*

PRESIDENT'S MESSAGE

TAKING ACTION WITH AND FOR THE PEOPLE IN THE COUNTRIES WE SERVE



The threat of infectious disease and the epidemic risk have never been higher: new pathogens keep emerging while others reappear, mutate, and adapt; and wars and climate change lead to the displacement

and concentration of particularly vulnerable populations. Developing countries are the primary victims, with women and children paying the steepest price. Traditional top-down approaches have demonstrated their limited efficacy in combating infectious diseases. They must now give way to new, local initiatives, conducted with and for the residents of those communities. The objective is to transfer, over the long term, these health capacities and facilities to the people who will use them, ensuring they take full ownership of them.

The Foundation is committed to supporting these new approaches by sharing our 50 years of experience in the field of infectious disease, our knowledge of the field, and our international partnership network. Our mission is to strengthen biological diagnostic capacities, which are currently insufficient in developing countries. Without diagnostics, medicine is blind. Diagnostics provide quick and precise information at the patient's point of care, allowing us to better understand and track the enemy, guide prescriptions, and reduce resistance to treatments. More generally, diagnostics inform local, national, and global health policies for better control of epidemics. This commitment to diagnostics is the driving force behind the work of the Mérieux Foundation and Fondation Christophe et Rodolphe Mérieux.

However, our fight against infectious disease goes even farther, taking a global health approach. Since we can't ignore the realities in the field and the ever-increasing number of crises, we have chosen to expand our operations. In the countries where we work, we go beyond simply treating the sick in order to help provide the most vulnerable of all, women and children, with what they need: housing, physical protection, safe food and water, a healthy environment, education, socioeconomic assistance, etc. Our work in Haiti for the past several years, and now in Iraq, with the help of our partners, proves that we must remain open and pragmatic in an uncertain environment. We must constantly adapt to changing circumstances to ensure that our actions are effective, and we must always harness the strength of our networks.

Our world is extraordinarily complex, and increasingly harsh. But at least we know that we can count on the commitment and generosity of the women and men who are ready to rebuild and restore hope."



Alain Mérieux
President

**A PUBLIC HEALTH
MISSION**

An independent family foundation with public interest status, the Mérieux Foundation is committed to fighting against infectious diseases affecting developing countries especially by reinforcing their clinical biology capabilities.

With its network of clinical biology laboratories, the Mérieux Foundation focuses on diagnosis, an essential factor in patient care and a decisive tool in disease surveillance and control. With a global health approach that takes all a population's needs into account, the Foundation's teams also come to the assistance of the most vulnerable, particularly mothers and children.

The Mérieux Foundation works closely with **Fondation Christophe et Rodolphe Mérieux**, an independent family foundation under the aegis of the Institut de France, sharing the same public health goals.

THE MÉRIEUX FOUNDATION'S ACTION FOCUSES ON FOUR MAIN OBJECTIVES:

INCREASING VULNERABLE POPULATIONS' ACCESS TO DIAGNOSTICS
by strengthening clinical laboratories in national healthcare systems,

ENHANCING LOCAL APPLIED RESEARCH CAPABILITIES
by training researchers, developing collaborative programs and creating Rodolphe Mérieux Laboratories, transferred to local partners,

ENCOURAGING KNOWLEDGE-SHARING AND PUBLIC HEALTH INITIATIVES
working with Les Pensières Center for Global Health,

IMPROVING CONDITIONS FOR MOTHERS AND CHILDREN taking a global health approach.

THE MÉRIEUX FOUNDATION'S PHILOSOPHY OF ACTION

A COLLABORATIVE DYNAMIC
driven by partnerships with local healthcare stakeholders, international organizations, academic research, companies and NGOs,

A LONG-TERM VISION with sustained support leading to autonomy and local ownership of infrastructures and programs,

BUILDING NETWORKS for international cooperation to share experience and pool skills,

A GLOBAL HEALTH APPROACH
from humans to animals, taking into account healthcare, but also nutrition, environmental safety, education and socio-economic support for patients.



DIRECTOR GENERAL'S EDITORIAL

INCREASED FUNDING FOR PUBLIC HEALTH WORLDWIDE



We all know that global health needs more funding. Over 17 million people succumbed to an infectious disease in 2016 and most of them were living in a low income country. Tangible progress has been made, particularly

thanks to the considerable resources mobilized during the past decade through initiatives like the Global Fund, Unitaïd and GAVI. But the crisis caused by the Ebola outbreak in 2014 is a reminder that beyond the critical combat against diseases, establishing an integrated approach to improve the national and regional health systems is an imperative.

Taking an integrated approach, the Mérieux Foundation focuses first and foremost on the people behind the systems: healthcare personnel, supervisors, researchers, and civil servants in charge of health programs. It strengthens the capacity for action of the men and women who, in the field, fight on the front lines against infectious diseases. Our two priorities are creating quality laboratories in the capitals, for research and surveillance, and in the regional hospitals, to encourage access to diagnostics. As part of a long-term commitment, these resources are developed with the aim that our local partners assume ownership.

In this context, 2016 represents a new milestone in the growth of funding dedicated to the Mérieux Foundation's international activities, with an annual budget that now surpasses 20 million euros. Driven by Dr. Christophe Mérieux's vision, in 2007, the Foundation embarked upon a phase of growth in its actions in the field in infection hotspots, to have a greater impact in the fight against infectious diseases.

This international development materialized thanks to a strong family commitment and new international partnerships, both public and private. It was also achieved in close collaboration with the Fondation Christophe et Rodolphe Mérieux, under the aegis of the Institut de France. Growing from 6 to 22 million euros in the space of 10 years, the Mérieux Foundation is now the French family foundation that invests the most in global health.

The financial needs are immense⁽¹⁾. However, beyond the amount of funding, which we hope will continue to grow to face the magnitude of infectious diseases in developing countries, an integrated, comprehensive approach and policy of partnerships are also keys to success for programs in the field.

Rather than taking over for local stakeholders, our approach is to invest in strengthening their capacity to take action."



Benoît Miribel
Director General

.....
1) The Bill & Melinda Gates Foundation, one of our partners, affirmed that the 5 billion dollars it spends annually is a "modest contribution with regards to the world's health needs" (Le Figaro, June 25, 2016)

A black and white photograph of a woman in a laboratory setting. She is wearing a white lab coat and a patterned headscarf. She is smiling and looking towards the camera. In the background, a microscope is visible on a lab bench. An orange circle is overlaid in the top right corner, containing white text.

**SUPPORT
FOR CLINICAL
BIOLOGY
LABORATORIES**

INCREASE ACCESS OF VULNERABLE POPULATIONS TO DIAGNOSIS by strengthening clinical laboratories in national healthcare systems

The first step for effective patient care, diagnostic testing is also an essential tool for monitoring and controlling disease. The Mérieux Foundation aims to reinforce the diagnostic testing infrastructure in developing countries and ensure their lasting integration into national healthcare systems.

Over and above investment in clinical biology infrastructure and equipment, the Mérieux Foundation strives to provide all the means to sustainably improve the day-to-day management of testing facilities, along with the quality and reliability of the data generated. This involves rolling out training programs aimed at the staff, standardized quality processes and IT systems devoted to testing activities.

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES:

PUTTING IN PLACE INFRASTRUCTURE,

equipment and IT systems for high quality medical biology,

REINFORCING THE SKILLS AND PROCESSES needed to perform diagnostic testing,

IMPROVING THE MANAGEMENT AND EFFICIENCY of clinical

biology laboratories (evaluation, mapping, supervision),

ASSISTING HEALTH AUTHORITIES in building a laboratory system that enables diseases to be prevented and monitored (management of samples, epidemiological monitoring, and creation of networks).

DIAGNOSIS AT THE HEART OF GLOBAL HEALTH CHALLENGES

Indispensable to epidemiological monitoring, the diagnostic phase is a major aspect in the WHO's International Health Regulations which aim to prevent serious risks for global world health. After the Ebola epidemic that hit West Africa in 2014, the reinforcement of global monitoring capacities has become a Global Health Security Agenda (GHSA) priority. It has received significant funding and has been the subject of many calls for projects, including from the CDC (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 in Senegal.

RECOGNIZED, LONG-STANDING EXPERTISE

■ In 2016, 2 biology laboratories were refurbished: the Garoua hospital blood bank in Cameroon and the Takeo hospital laboratory in Cambodia,

■ Since 2005, the Mérieux Foundation has built 13 laboratories, has renovated 31 and provided its technical support to more than 14 structures,

■ Since 2011, the Foundation has provided its expertise for 25 projects of partners such as the WHO, the UNDP (United Nations Development Programme) or the Global Fund to Fight AIDS, Tuberculosis and Malaria.



RESAOLAB FORMALIZING A REGIONAL APPROACH ANCHORED IN A QUALITY INITIATIVE

Launched in 2009, the West African Network of Biomedical Analysis Laboratories, RESAOLAB, currently comprises 500 public or private structures in seven countries (Benin, Burkina Faso, Guinea, Mali, Niger, Senegal and Togo).

The aim of RESAOLAB is to enhance the quality of, and access to, clinical diagnostics through a **regional approach** anchored in the enhancement of **quality management systems**. Designed with West African healthcare stakeholders, it takes into consideration all factors affecting the laboratories' governance and performance.

In 2016, the member countries pursued the RESAOLAB program activities, including:

- New training sessions and the **creation of biomedical maintenance training** as part of a partnership with the École Polytechnique Abomey-Calavi in Benin,
- Continued **supervision activities**, which enable laboratories' equipment and staff training levels to be assessed, and assist them in implementing a quality process (Benin, Burkina Faso, Guinea, Niger, Senegal and Togo in 2016),
- An **external quality assessment program** with the OneWorld Accuracy specialized consultancy: the testing results from 100 laboratories were compared to an external reference to evaluate the quality of the analyses and implement corrective action,
- Finishing the **construction of the Laboratories Directorate** in Togo and launching identical projects in Benin, Guinea and Niger.

RESAOLAB IN 2016

22 BAMS scholarships (see page 11) and 33 scholarships for the Diploma of Specialist Studies (DES) in Medical Biology

185 laboratories supervised

20 continuous professional development training sessions

16 external quality assessment sessions

RESAOLAB PARTNERS

The RESAOLAB program is conducted in close collaboration with the health ministries of the seven member countries. It is supported by the Agence Française de Développement, the Islamic Development Bank, the Department of International Cooperation of the Principality of Monaco, the Stavros Niarchos Foundation and the Mérieux Foundation. The WHO and the WAHO (West African Health Organisation) are also accompanying the initiative.



Since 2015, the Mérieux Foundation has been responsible for action **in support of the laboratories participating in the WARDS (West Africa Regional Disease Surveillance Project) program**, funded by the World Bank and coordinated by the West African Health Organisation (WAHO). The program aims to enhance the epidemiological surveillance system in West Africa, in particular by setting up peripheral surveillance centers. The Mérieux Foundation is one of the six partners in charge of running the program, alongside the WHO, the Centre for International Cooperation in Health and Development, the University of Oslo and the CDC Foundation.

The Mérieux Foundation provides its expertise to help improve the skills of laboratory staff in the eight member countries of the Economic Community of

WARDS ENHANCING EPIDEMIOLOGICAL DATA MONITORING IN WEST AFRICA

West African States (ECOWAS) not covered by the RESAOLAB network: Cape Verde, Côte d'Ivoire, Gambia, Ghana, Guinea-Bissau, Liberia, Nigeria and Sierra Leone.

THE OBJECTIVES ASSIGNED TO THE MÉRIEUX FOUNDATION UNDER WARDS

- Enhancing the capabilities of laboratory personnel through the RESAOLAB approach,
- Making the e-learning modules on laboratory techniques and management accessible,
- Contributing to the development of regional policies and activities.

In May 2016, a second regional workshop was organized in Ouagadougou (Burkina Faso). As in 2015, it was held jointly with RESAOLAB's meeting in order to bring together the fifteen ECOWAS countries to discuss the challenges facing laboratories and the prospects of a **harmonized clinical biology policy at the regional level**.

The first technical training courses began in Côte d'Ivoire with two sessions in July and September. They continued in Gambia in November, then in Ghana and Nigeria in December. In total, **90 laboratory technicians were trained**. Alongside this training, e-learning modules for laboratory technicians are available online and free to access. These modules will be translated into English and Portuguese to reach a wide audience in all the ECOWAS countries.



BAMS MEDICAL BIOLOGY TRAINING FOR LABORATORY TECHNICIANS

The **Bachelor of Science in Biological and Applied Medical Sciences (BAMS)** program is being run in Mali and in Haiti in partnership with the School of Biology, Biochemistry and Biotechnology (ESTBB) of the Catholic University of Lyon. The course, which leads to a degree, lasts eight or nine months and is aimed at laboratory technicians.

Twenty Haitian students joined the course in 2016, the sixth Haitian cohort, along with 24 students from eight West African countries for the 10th Malian edition. This tenth anniversary also marks the official transformation of BAMS Mali into a **Master's degree at the Bamako University of Science, Techniques and Technologies** starting in the new academic year in September 2017.

BAMS PARTNERS

The local partners of BAMS are the National Laboratory of Public Health in Haiti and the Charles Mérieux Center for Infectious Disease in Mali. The BAMS Haiti and Mali programs also receive financial support from Fondation Christophe et Rodolphe Mérieux and from the RESAOLAB partners for the training in Mali.

COUNTRY INITIATIVES ++++++

AFRICA

GUINEA



LAB-NET HEMORRHAGIC FEVER SURVEILLANCE PROJECT

Launched in 2015, the aim of the LAB-NET project is to improve monitoring of hemorrhagic fever in Guinea by **strengthening laboratory capabilities**. In 2016, over 100 Guinean laboratories were evaluated, giving rise to recommendations and a training plan carried out in conjunction with the Guinean authorities. Funded by the Ministry of Foreign Affairs and International Development and coordinated by Expertise France, LAB-NET is run by the Mérieux Foundation with the Pasteur Institute and the Guinean Ministry of Health.

LABOGUI PROJECT LAUNCH

The LABOGUI project, launched in late 2016, aims to assist with the implementation of a **national clinical biology policy** in Guinea, via three components:

- Enhancing the institutional framework,
 - Improving conditions for performing clinical biology by building capacities in the 30 regional hospital laboratories,
 - Making laboratory management more professional and improving the clinical biology practices of laboratory personnel.
- The project is funded by Agence Française de Développement and implemented in partnership with the Ministry of Health and the Pasteur Institute of Guinea.

MADAGASCAR



EXPANDING BACTERIOLOGY SERVICES

Activities to support the Madagascan hospital laboratories continued in 2016 by **establishing a bacteriology unit** in the Morafeno University Hospital Center laboratory in Tamatave. Jointly funded by the Mérieux Foundation and the Agence Française de Développement, this technical assistance is provided in partnership with the Madagascan Ministry of Health Laboratories Department, the Charles Mérieux Center for Infectious Disease and the Indian Ocean Commission.

A REFERENCE LABORATORY FOR LEPROSY

Within the framework of monitoring the resistance to leprosy drugs, the Charles Mérieux Center for Infectious Disease in Madagascar was officially acknowledged as the **National Reference Laboratory for Leprosy** in October 2016. This recognition was awarded at a consultation meeting in the presence of representatives of the WHO, the National Program to Combat Leprosy in Madagascar, the Raoul Follereau Foundation, the Bacteriology-Hygiene department of the Lariboisière hospital and the Swiss Leprosy Research Center.

ANTIMICROBIAL RESISTANCE

The Foundation continues its efforts to make the bacteriology laboratory at the Befelatanana University Hospital Center a laboratory of excellence for antimicrobial resistance surveillance in Madagascar. In 2016, **over 2,000 samples were processed** in this lab for 11 different kinds of tests. For example, testing revealed 47% of *Staphylococcus aureus* were methicillin-resistant *versus* 17% in France. The project also makes the laboratory's activity sustainable by giving it financial independence.

TUBERCULOSIS CARE

Thanks to operational support from the Befelatanana University Hospital Center and the ASM (Help and Care for Patients) Association, the Foundation initiated a project in 2016 aimed at improving care for people in contact with tuberculosis (persons having been in prolonged contact with a patient in the three months preceding their diagnosis). Over 100 radiographic analyses were carried out and **the persons needing treatment were cared for free of charge** according to the protocol in force.

AFRICA

MALI



BUILDING CAPACITIES AT THE CHARLES MÉRIEUX CENTER FOR INFECTIOUS DISEASE

The Charles Mérieux Center for Infectious Disease in Bamako continues to fit out the BSL3 biosecurity-level laboratory inaugurated in 2015 with funding from Fondation Christophe et Rodolphe Mérieux. Dedicated to diagnostics and research on resistant tuberculosis, this **laboratory was provided with equipment in 2016** funded through the CDC-GHSA (US Centers for Disease Control and Prevention – Global Health Security Agenda). It should be operational in 2017.



MOBILE DIAGNOSTICS LABORATORY

Housed in the Charles Mérieux Center for Infectious Disease in Mali, the mobile laboratory, dedicated to the detection of Ebola virus disease and other dangerous pathogens, is designed to be deployed to remote regions and/or regions where access is difficult in the event of a suspected epidemic. It was officially handed over to the Ministry of Health and Public Hygiene in December of 2014. After two training sessions and a deployment exercise organized in 2015, **training continued in 2016** and a second deployment exercise was organized in Koulikoro at the end of the year. The project was funded by the German Partnership Program for Excellence in Biological and Health Security.

BUILDING A BIOSECURITY NETWORK IN THE SAHEL G5

The idea of creating a **biosecurity network for the diagnosis of highly pathogenic agents** within the Sahel G5 countries (Burkina Faso, Chad, Mali, Mauritania, and Niger) was born in 2016. Experts from the member countries participated in training on the mobile laboratory at the Charles Mérieux Center for Infectious Disease in Bamako. The project is funded by the German Partnership Program for Excellence in Biological

and Health Security, with the support of numerous operational partners (GIZ, Bundeswehr Institute of Microbiology, Charles Mérieux Center for Infectious Disease of Mali, the Mérieux Foundation, the health ministries of Burkina Faso, Chad, Mali, Mauritania and Niger, WHO, WAHO, and the Permanent Secretariat of the Sahel G5).

ENHANCING BIOSECURITY/ BIOSAFETY CAPABILITIES

The DJOMI project, resulting from collaboration between Catholic Relief Services, the NGO Mali Health and the Mérieux Foundation, and funded by the CDC-GHSA (US Centers for Disease Control and Prevention - Global Health Security Agenda), will contribute to reinforcing Mali's ability to **prevent, detect and respond to epidemic diseases**, strengthen cross-border health security and attenuate public health emergencies on an international scale. In 2016, several training sessions were dispensed to healthcare personnel, in particular on biosecurity-biosafety, sample collection and transport and antimicrobial resistance. An assessment of the clinical biology laboratories was carried out in three regions in Mali (Kayes, Sikasso and Bamako District).

COUNTRY INITIATIVES ++++++

AFRICA

SENEGAL

AMERICAS

HAITI



EPIDEMIOLOGICAL DATA MANAGEMENT

The **I-Lab project** is continuing. Its aim is to support the Laboratories Directorate in implementing an electronic epidemiological data reporting system in Senegal via the DHIS2 health data management platform, validated by the Senegal Ministry of Health and Social Welfare, and by WAHO. Initiated in 2015 at the request of the Senegal Laboratories Directorate, the project is funded by the Skoll Global Threats Fund and run with the NGO PATH. In 2016, personnel from 62 laboratories (out of 120) were trained and now transmit their data weekly.

LABORATORY POLICY

The Mérieux Foundation obtained funding to **participate in the activities of the Senegal GHSA** in a consortium with the NGO PATH. The objective is to contribute to drawing up the laboratories' strategic plan and to deploying capacity building actions in the areas of "Biosecurity and Biosafety" and "Resistance to antimicrobial agents".



ASSESSING THE CONDITION OF LABORATORIES

In 2016, the analysis of the condition of the laboratory sector in Haiti, part of the **SPHaitiLAB** project, was completed. This included assessment of thirty laboratories across the country and assessment of the implementation of the "Five-year Strategic Plan of the National Laboratories Network 2010-2015", the conclusions of which served to draw up the **National Laboratories Policy**. In parallel, a **study on multidrug-resistant tuberculosis** was initiated by the GHESKIO Centers (Haitian Group for the Study of Kaposi's

Sarcoma and other Opportunistic Infections) with the collection of the first samples at five sites in the country. The SPHaitiLAB project, jointly funded by the European Union and the Mérieux Foundation (which also coordinates the project), is a collaboration between the Haiti National Public Health Laboratory, the Epidemiology, Research and Laboratory Directorate, the GHESKIO Centers and the African Institute of Public Health in Burkina Faso.

ASIA

CAMBODIA



LAOS



MYANMAR



NATIONAL EXTERNAL QUALITY ASSESSMENT PROGRAM

Assuring the quality of diagnoses is a key area in the project to **strengthen the CAMLAB network of Cambodian laboratories** that the Mérieux Foundation has been supporting for several years. In 2016, the national external quality assessment program was renewed as part of a collaboration with the Bureau of Medical Laboratory Services and the National Institute of Public Health of the Cambodian Ministry of Health and with the support of the WHO, NAMRU-2 (Naval Medical Research Unit Two) and the US CDC (Centers for Disease Control and Prevention).

TRANSFORMING THE BATTAMBANG HOSPITAL LABORATORY

Recently designated a **Regional Reference Center**, the microbiology laboratory of the Battambang province hospital is being extended with the support of the Mérieux Foundation. A feasibility study, project design, purchasing of equipment and laying of the first stone were all done in 2016 as part of a collaboration with the Bureau of Medical Laboratory Services of the Cambodian Health Ministry, the hospitals department of the province of Battambang and the 3LAN Construction Engineering company.

CREATING A DISTRICT LABORATORY NETWORK

The **LAB KHAM** project to form a network of the **Khammouane Province laboratories** continued in 2016 via several actions: technical capability evaluation visits, enhancement of continuing professional development and quality assurance. These actions are carried out in conjunction with the Thakhek provincial hospital, the district hospitals and the Provincial Health Directorate with financial support from the Auvergne-Rhône-Alpes Region.

ESTABLISHING HIV VIRAL LOAD TESTING

Since 2011, the Mérieux Foundation has assisted with transferring the technology for viral load quantification testing to monitor people living with HIV in Myanmar. Training, upgrading of equipment and operational support is provided to the Mandalay Public Health Laboratory and to the Yangon National Health Laboratory. In 2016, **over 20,000 viral load tests were carried out** by the two centers.



SUCCESS OF HIV TREATMENT IN LAOS AND MYANMAR

In Laos and Myanmar, the Mérieux Foundation is improving access to HIV viral load measurement. The test **improves the care of people living with HIV** and reduces the risk of treatment failure. This action helps to meet the UNAIDS "90-90-90" 2020 treatment target which aims to have 90% of all people living with HIV know their HIV status, 90% of people with diagnosed HIV infection receive sustained antiretroviral

therapy and 90% of those receiving antiretroviral therapy have viral suppression. In Laos, the Foundation works in synergy with the National HIV+ Program, The Global Fund and WHO. In Myanmar, it partners with the NGOs MSF Holland, MSF Switzerland and The Union. In both countries, the success of treatment is very close to, or has reached, the 90% targets, depending on the laboratory.

A black and white photograph of two scientists in a laboratory setting. They are both wearing white lab coats, hairnets, and face masks. The scientist on the left is holding a pipette and is in the process of adding liquid to a small vial held by the scientist on the right. A multi-well plate is visible in the bottom left corner. A bright blue circle is overlaid on the top right of the image, containing the text 'COLLABORATIVE RESEARCH PROGRAMS' in white, bold, sans-serif capital letters.

**COLLABORATIVE
RESEARCH
PROGRAMS**

ENHANCING LOCAL APPLIED RESEARCH CAPABILITIES

Local applied research capacity-building is one of the Mérieux Foundation's strategic priorities. The Foundation **trains researchers, develops collaborative programs and creates laboratories of excellence** at the heart of infectious disease hotspots in developing countries: the **Rodolphe Mérieux Laboratories**, which are transferred to local partners.

The Mérieux Foundation's research efforts draw upon the expertise of the **Emerging Pathogens Laboratory in Lyon** which coordinates and supports the work of the research laboratories belonging to the **GABRIEL network**, which include the Rodolphe Mérieux Laboratories.

THE EMERGING PATHOGENS LABORATORY

A LABORATORY OF EXCELLENCE, MEMBER OF NUMEROUS SCIENTIFIC NETWORKS

Located in Lyon-Gerland, at the heart of the Charles Mérieux Campus for research on infectious diseases, the Mérieux Foundation's Emerging Pathogens Laboratory is housed in the same hub as the **BSL4 Jean Mérieux-Inserm Laboratory**, which the team can access for its research.

The Emerging Pathogens Laboratory, whose scientific team is a member of the International Center for Infectiology Research (CIRI), belongs to several **scientific networks of excellence**: AVIESAN (French National Alliance for Life Sciences and Health), ISARIC (International Severe Acute Respiratory and Emerging Infection Consortium) and the European Union's HORIZON 2020 research programs (COMPARE, GloPID-R and ZikaPLAN). Since 2016, the laboratory has been **a partner in the European EVAg Consortium** (European Virus Archive global), financed by the European Union and devoted to the collection, characterization, production and distribution of viruses and associated products.

THE EMERGING PATHOGENS LABORATORY IN 2016

2 PRIORITY TOPICS:

- Respiratory infections,
- Foodborne diseases.

2 MAJOR ACTION AREAS:

- Developing and transferring technologies for infectious disease diagnosis and epidemiological monitoring,
- Supporting the careers of researchers in developing countries by establishing partnerships and collaborative research programs, and delivering training.



GABRIEL NETWORK AN INTERNATIONAL NETWORK TO ADDRESS THE HEALTH NEEDS OF DEVELOPING COUNTRIES

Created by the Mérieux Foundation in 2008, the **GABRIEL network** (*Global Approach to Biological Research, Infectious diseases and Epidemics in Low-income countries*) has **18 members in 16 countries**: the eight Rodolphe Mérieux Laboratories - laboratories of excellence - and academic, university and hospital research institutes. Its members work in developing countries and conduct research projects that target local infectious disease priorities: respiratory infections and fevers, foodborne diseases, and neglected diseases.

The new Rodolphe Mérieux Laboratory in Chittagong, Bangladesh inaugurated in 2015 will be joining the GABRIEL network. Several institutions applied in 2016 to join the network in 2017.

ISO 15189 QUALITY ACCREDITATION

In 2014, the Mérieux Foundation launched a Quality initiative to enable GABRIEL member laboratories to meet the international qualification requirements of standard ISO 15189. A self-evaluation questionnaire was deployed in collaboration with the Instituto Oswaldo Cruz in Brazil in June 2016. Training on "practical metrology in a laboratory according to the ISO 15189 standard" was given in collaboration with Mérieux Université (Institut Mérieux's internal university) to several members of the GABRIEL network in Haiti, Mali and Madagascar.

THE GABRIEL NETWORK IN 2016

Over 50 scientific publications

(articles available at
www.gabriel-network.org)

Training given to 50 researchers
(6 in Lyon and 44 abroad)

immunology, biosafety, diagnostic tools,
research protocols, quality standards
and processes

THE 8TH ANNUAL INTERNATIONAL MEETING OF THE GABRIEL NETWORK

- July 5-8, 2016 in Vientiane (Laos)
- Over 100 scientists from 25 countries
- Key subjects: antimicrobial resistance, "One Health" approach
- "2016 Young Researchers Award" winners: Cristiana Garcia (Fiocruz, Brazil) and Ariane Nzouankeu (Pasteur Center, Cameroon) for their work devoted respectively to pulmonary infections and molecular characterization of multi-resistant *Salmonella*

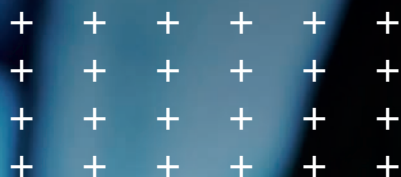
2016 CHRISTOPHE MÉRIEUX PRIZE

The 2016 Christophe Mérieux Prize was awarded to Professor Francine Ntoumi of the Faculty of Science and Technology of Brazzaville (Congo) for her research work on infectious diseases in Central Africa.

The leading player in the Multilateral Initiative on Malaria, Francine Ntoumi has devoted her career to enhancing research capabilities in Africa. She coordinates the CANTAM project (Central Africa Network on Tuberculosis, HIV/AIDS and Malaria), is the director of the molecular biology laboratory of the Marien Ngouabi University in Brazzaville and is the CEO of the Congolese Foundation for Medical Research.



RESEARCH PROJECTS



FOODBORNE DISEASES

COMPARE HORIZON 2020 PROJECT

The Mérieux Foundation is a partner of the COMPARE* project which aims to develop a global **hub for the rapid identification of the pathogens responsible for epidemics in humans and animals by next generation sequencing**. Funded by the European Union's Horizon 2020 program, the project involves a consortium of 29 partners (public and animal health research groups, food safety institutes) and is coordinated by the Technical University of Denmark and Erasmus MC. In 2016, several hundred strains were collected by the GABRIEL network laboratory in Bangladesh in conjunction with the Institute for developing Science and Health initiatives in Bangladesh and the Child Health Research Foundation.

* Collaborative Management Platform for detection and Analyses of (Re-)emerging and foodborne outbreaks in Europe

VALIDATING THE TYPHOID SCREENING TEST IN AFRICA

Faced with the lack of specificity of the existing detection methods, the Bill & Melinda Gates Foundation funded the development of a new typhoid screening test by the Emerging Pathogens Laboratory. As the disease is endemic in Southeast Asia and Sub-Saharan Africa, the method was validated in Bangladesh and is currently being **evaluated in Burkina Faso, Ghana and Malawi**. In 2016, over 220 blood samples were collected and tested with scientific support from the International Vaccine Institute and the Malawi-Liverpool-Wellcome Trust.

PREVENTING INTESTINAL SCHISTOSOMIASIS IN MADAGASCAR

The second most prevalent parasitic endemic after malaria, intestinal schistosomiasis is the subject of a project launched in Madagascar in 2015 by the Mérieux Foundation to **determine the prevalence of the disease in schools** and initiate appropriate preventive action. In 2016, children were screened in twelve primary schools in the Haute Matsiatra region and positive children were cared for, according to the WHO protocol. Campaigns to raise awareness of risk factors were carried out with the help of local healthcare center personnel. The project receives support from the Fianarantsoa University Hospital Center and the NGO ODEFI.



RESEARCH
PROJECTS

HEPATITIS

DIAGNOSING HEPATITIS B
AMONG BLOOD DONORS
IN MALI

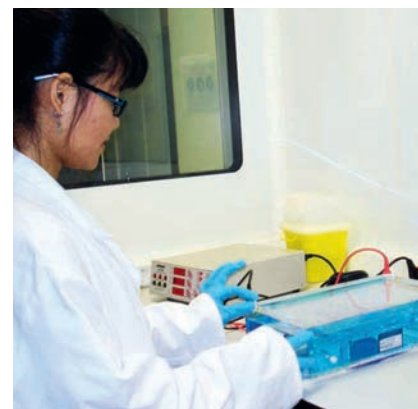
Funded by the Mérieux Foundation and run in conjunction with the National Blood Transfusion Center of Mali, a study was initiated in 2016 to evaluate the **viral load of hepatitis B among blood donors in Bamako**. In total 300 blood donor volunteers were recruited and the data are currently being analyzed.

HEPATITIS C
MONOINFECTION AND
HEPATITIS C-HIV
COINFECTION IN
CAMBODIA

The research project on the prevalence of hepatitis C, particularly in people living with HIV and pregnant women, was initiated in 2016 in four regions in Cambodia. This study was carried out in structures offering antiretroviral treatments and pre-natal care clinics, and will serve to draw up a **national policy of preventing hepatitis C and coinfections by hepatitis C and HIV**. These studies are carried out with the support of the Cambodia University of Health Sciences, the National Center for HIV/AIDS, Dermatology and STD, the Pasteur Institute of Cambodia, the NGO KHANA and the University of New South Wales, Australia.

HEPATITIS B PREVALENCE
IN PREGNANT WOMEN IN
LAOS

Despite the availability of vaccination against hepatitis B and its introduction into the national vaccination program, materno-fetal transmission remains the principal source of contamination in Laos. Since 70% of births occur outside hospitals, the purpose of this study is to **identify those women who carry the virus in order to offer them medicalized childbirth**, enabling the newborn to receive an initial dose of the vaccine at birth. This study, which is the subject of a science thesis at Claude Bernard Lyon 1 University, also helps to **identify the obstacles to the implementation of a national prevention plan**. It is being carried out in conjunction with the Mahosot Hospital, the Mother and Child hospital of Vientiane and the Center of Infectiology Lao Christophe Mérieux.



TUBERCULOSIS AND OTHER MYCOBACTERIAL DISEASES

TUBERCULOSIS TRANSMISSION IN GEORGIA

On the basis of the results obtained in 2014 by studying the direct transmission of tuberculosis within Georgian sites, a new study has started to confirm the data obtained on a statistically more robust cohort. The aim is to **identify the sources of propagation of the disease** by determining the percentage of direct transmission within a family when several members are affected. The study is being carried out in conjunction with the National Center for Tuberculosis and Lung Disease and the genomics and microgenomic hub of Claude Bernard Lyon 1 University (ProfileXpert).

TUBERCULOSIS CONTROL IN PRISONS IN BANGLADESH

The project to evaluate tuberculosis in prisons has been in progress since 2013 in the largest prison in Dhaka, in partnership with the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b), which intervenes *in situ* to reduce propagation of the disease. The results of the study show that almost half of the patients have been infected inside the prison and that the number of intra-prison transmissions has been divided by three since the start of the operation by the icddr,b. A publication is currently being submitted to **promote the efficacy of the icddr,b intervention model in high infection risk environments**.

MOLECULAR EPIDEMIOLOGY OF TUBERCULOSIS IN LAOS

Since 2013, the project of molecular typing of tuberculosis strains circulating in Laos has been carried out within the structure of the International Mixed Laboratory*. This study, which will enable information to be obtained on the lines and genotypes in circulation in order to **enhance the efficacy of the national tuberculosis control plan**, is the subject of a partnership with the French National Research Institute for Sustainable Development of Montpellier, the Vietnam National Institute of Hygiene and Epidemiology, the Pasteur Institute of Cambodia, the Center of Infectiology Lao Christophe Mérieux and the Emerging Pathogens Laboratory.

*The International Mixed Laboratory succeeded the International Research Group ID-Bio.

TROPICAL MYCOSES IN MADAGASCAR

The **research program on the occurrence and environmental sources of tropical mycoses including chromoblastomycosis and sporotrichosis** continues. These are neglected diseases mainly spread across rural and tropical areas of developing countries. The study was initiated in Madagascar in 2013 via a pilot project carried out in partnership with the dermatology department of the Befelatanana hospital in Antananarivo, then as part of a thesis topic with the support of the Grenoble-Alpes University and the Antananarivo University. This work has already improved patient care by providing simple molecular diagnostic techniques and training health professionals.

LEPROSY DRUG RESISTANCE SURVEILLANCE IN MADAGASCAR

In Madagascar leprosy remains a major public health problem despite the effort made by the national program to combat the disease, and the availability of leprosy treatment for some 20 years. The study carried out by the Charles Mérieux Center for Infectious Disease in Madagascar, acknowledged in 2016 as the National Reference Laboratory for Leprosy, involves **monitoring resistance to leprosy antibiotics**. This work was conducted in partnership with the dermatology department of the University Hospital Center in Befelatanana (Antananarivo), the Raoul Follereau Foundation, the National Leprosy Program, the National Reference Center for Mycobacteria and Mycobacterial Resistance to Tuberculosis Drugs, the Ministry of Public Health, and the WHO Country Office in Madagascar.

LEPROSY

A neglected tropical disease, leprosy is a chronic disease caused by the *Mycobacterium leprae* bacillus. It is endemic in several regions of the world with 14 countries recording almost 1,500 new cases per year since 2006. The major focus in combating the disease is evaluating the resistance to leprosy drugs.

RESEARCH PROJECTS

+ + + + + +
+ + + + + +
+ + + + + +
+ + + + + +

RESPIRATORY DISEASES

OCCURRENCE AND ORIGIN OF PNEUMONIA IN LAOS

Initiated in 2015, the LaCoRIS project aims to **measure the occurrence and identify the pathogens responsible for respiratory diseases by studying a Laotian community cohort**. This cohort comprises almost 1,000 households, or almost 5,000 individuals originating from 25 villages in the capital Vientiane. The initial results demonstrate an occurrence rate of 11.6% with high positivity levels for *Streptococcus pneumoniae*, followed by *Staphylococcus aureus*, then the influenza A virus. The project is being carried out as part of a scientific collaboration between the Center of Infectiology Lao Christophe Mérieux, the London School of Hygiene & Tropical Medicine, Bangkok, the microbiology laboratory of the Mahosot hospital and the Emerging Pathogens Laboratory.

TRANSFERRING THE “PCR MULTIPLEX” DIAGNOSTIC TEST

The pneumonia typing test by “real-time multiplex PCR” developed by the Mérieux Foundation's Emerging Pathogens Laboratory enables **the world's 40 most commonly described serotypes responsible for pneumonia** to be identified. Already evaluated on cohorts of adults and children from South Africa, Brazil and France, the screening technique is currently being transferred to the GABRIEL network laboratories. This work was the subject of two scientific publications in 2016.

ETIOLOGY OF PNEUMONIA CASES IN A REFUGEE POPULATION

The PEARL study (Pneumonias' Etiology Among Refugees and Lebanese population) involves a consortium of partners from various regions of Lebanon, from academia (Saint Joseph University in Beirut and Lebanese University of Tripoli), the humanitarian sector (the Al-Bashaer and Amel associations), private sector (Bioteck), and biological expertise (Chtoura Hospital and the University of Lyon). Funded by the Mérieux Foundation, the PEARL study was initiated in 2016 to **identify pathogens causing respiratory infections among refugee and Lebanese populations**. This involves providing a rational database to inform not only recommendations for prevention and treatment protocols, but also a **methodology transposable to other emergency contexts**. A file was submitted to the Bill & Melinda Gates Foundation in 2016 which agreed to co-fund the project in early 2017.

TYPING OF PNEUMOCOCCUS IN CIRCULATION IN CAMBODIA

A program to vaccinate newborns against pneumococcus infections was initiated in January 2015 in Cambodia by GAVI, the Vaccine Alliance. In the absence of data on the serological distribution of pneumococci, a research project was set up by the Pasteur Institute of Cambodia with the Mérieux Foundation in order to **identify the various serotypes circulating in the country**. In 2016, almost 250 isolates were analyzed at the Rodolphe Mérieux Laboratory in Phnom Penh with the assistance of the Sihanouk Hospital Center of Hope and thanks to the support of the Pasteur Institute of Cambodia and NAMRU-2 (Naval Medical Research Unit Two).

PNEUMOCOCCUS INFECTIONS

There are more than 90 serotypes that cause pneumococcus infections, with varying degrees of virulence. They may cause minor infections (otitis, sinusitis or asymptomatic colonization) but also serious diseases such as meningitis, septicemia and severe pneumonia, the leading cause of child mortality in the world.

VIRAL AND BACTERIAL COINFECTIONS

Following on from the thesis presented in 2015, new work is being carried out in order to understand the **mechanisms involved in viral and bacterial coinfection** involving the syncytial respiratory virus and pneumococcus (a recurrent combination observed in the multi-center study carried out within the GABRIEL network, the results of which were published in 2015). This research, part of a collaboration between the Emerging Pathogens Laboratory and the VirPath research laboratory (Claude Bernard Lyon 1 University), may result in **identifying a therapeutic alternative to existing antiviral treatments**, for which certain pathogens have already developed a range of resistance.

STUDYING THE EPIDEMIC DYNAMIC OF INFLUENZA VIRUSES IN CAMBODIA

Thanks to the ARTS - Mérieux Foundation scholarship, a Cambodian doctorate student is completing a three-year university thesis on influenza viruses in Cambodia, co-directed by the Claude Bernard Lyon 1 University and the Cambodian University of Health Sciences. In 2016, 1,406 nasal samples were collected and analyzed to **identify the causative agents of pneumonia**. This thesis, which will enable these samples to be analyzed, is being conducted in the Rodolphe Mérieux Laboratory in Phnom Penh, with support from the Mérieux Foundation, in conjunction with Singapore's DSO National Laboratories.

FEVERS

CRIMEAN-CONGO VIRUS

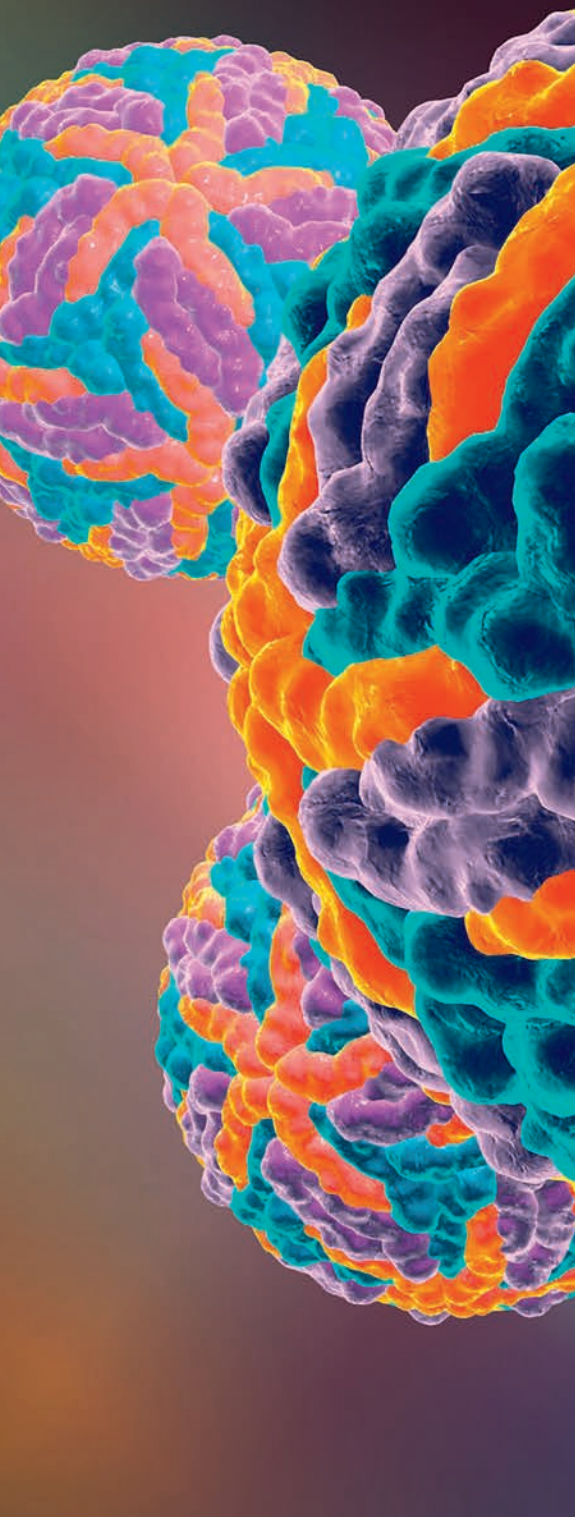
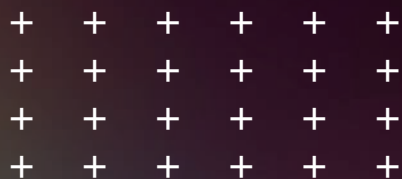
Since 2009, the Emerging Pathogens Laboratory has been **studying the pathogenesis of the Crimean-Congo virus** in partnership with the French Armed Biomedical Research Institute and the Inserm BSL-4 team. By means of the *in vitro* study of cellular lines, the research teams have identified an autophagy phenomenon in the replication cycles of the virus. This work was the topic of a successful doctoral thesis* presented in December 2016. The Mérieux Foundation also participates in the CIRI (International Center for Infectiology Research) collaboration project which aims to study the innate immune response to the virus. **The results will contribute to the design or adaptation of new therapeutic approaches.**

** Study of the mechanisms involved in the physiopathology induced by the Crimean-Congo hemorrhagic fever virus, Marie Moroso, Claude Bernard Lyon 1 University*

THE CRIMEA-CONGO HEMORRHAGIC FEVER

A viral zoonosis transmitted by ticks, the Crimean-Congo disease is fatal in 10 to 50% of cases. The virus responsible is highly pathogenic, initially described in cases observed in the Crimea then in the Congo. It is widely spread across the globe and induces a severe hemorrhagic fever for which no vaccine or specific treatment exists.

RESEARCH PROJECTS



FEVERS

FEVER MONITORING IN MALI

A study aimed at understanding the origin of the febrile syndromes in Malian children was launched in 2016 in conjunction with the Charles Mérieux Center for Infectious Disease in Bamako, the Bundeswehr Institute of Microbiology and the pediatric departments of the Gabriel Touré hospital and the Mali hospital. **Understanding the etiologies of infections will improve the diagnosis, treatment, prevention and control of fevers in the country.** In total 1,000 patients will be recruited. The study is supported by the German Partnership Programme for Excellence in Biological and Health Security of the Federal Ministry of Foreign Affairs.



MENINGITIS

MONITORING MENINGITIS IN MADAGASCAR

The project to monitor bacterial meningitis, started in 2011, continues with the analysis of samples using the real-time PCR screening technique developed by the Emerging Pathogens Laboratory and transferred in 2015 to the Charles Mérieux Center for Infectious Disease in Madagascar. In 2016, the **detection spectrum was extended to other bacteria responsible for meningitis for effective microbiological monitoring in the face of emerging or re-emerging pathogenic strains.** The project is being carried out with the WHO office in Madagascar and with the collaboration of the infectious diseases laboratory and department of the Joseph Raseta Befelatanana University Hospital.



HIV/AIDS

EVALUATING ANTIRETROVIRAL DRUG EFFICACY IN MADAGASCAR

It is estimated that 60,000 people are currently living with HIV in Madagascar and that almost 30,000 urgently need antiretroviral treatment. After organizing the transfer of the viral load measurement test at the Charles Mérieux Center for Infectious Disease in Antananarivo, a project to **reinforce access to viral load testing** in Madagascar and a project to evaluate the therapeutic efficacy of antiretroviral treatment in all patients seen at least once during the year are being examined with the national players involved in combating HIV/AIDS.

EVALUATING THE HIV PRIMARY RESISTANCE RATE IN LAOS

Launched in 2014, this study aims to evaluate the prevalence of primary resistance to the antiretroviral drugs used in the treatment of HIV in Laos (resistance of treatment-naïve patients). The results will enable **recommendations to be issued to the authorities in order to maintain the efficacy of the first two therapeutic lines available in the country**. This study was carried out among 475 recently HIV-diagnosed patients, in partnership with the Center of Infectiology Lao Christophe Mérieux and eight National HIV Program centers.

CANCER

EXTENDING THE CERVICAL CANCER STUDY IN LAOS

At the end of the comparative study on cervical cancer screening tests in Laos, the LaoCol-VP project has been extended by one year to **guarantee treatment for all participants**. The project is funded by the National Cancer Institute and by the Mérieux Foundation, which conducted it in partnership with the Center of Infectiology Lao Christophe Mérieux, the Laos Health Ministry National HIV Program and the Research and Development Institute based at the Chiang Mai University.



ZIKA

ANALYZING THE LINK BETWEEN ZIKA AND GUILLAIN-BARRÉ SYNDROME

The causality link between infection by the Zika virus and the Guillain-Barré neurological syndrome was established after the Zika epidemic in French Polynesia in 2013-2014. The **purpose of the ZIKAGEIS study, initiated in 2016 in Bangladesh, is to understand the role of the virus in the etiology of Guillain-Barré syndrome**. Funded by the GEIS (Global Emerging Infectious Disease Surveillance) program of the United States Department of Defense, the project is coordinated by the Mérieux Foundation in conjunction with Erasmus University Rotterdam and the International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b). Almost 500 patients suffering from Guillain-Barré syndrome were included in the study in 2016.

GUILLAIN-BARRÉ SYNDROME

The Guillain-Barré neurological syndrome, which may cause paralysis of the limbs and respiratory problems, is mainly triggered after a viral or bacterial infection. In the countries affected by the Zika virus, an unexpected increase in the number of cases of Guillain-Barré syndrome was observed, indicating that infection by the Zika virus was a triggering factor.

**KNOWLEDGE-SHARING
AND PUBLIC HEALTH
PARTNERSHIPS**

KNOWLEDGE-SHARING AND TRANSFER - CORE COMPONENTS OF THE MÉRIEUX FOUNDATION'S STRATEGY

The Mérieux Foundation firmly believes in sharing scientific and medical knowledge across borders and disciplines, working worldwide to foster knowledge-sharing and transfer. The Mérieux Foundation organizes international symposia and conferences in an effort to share and disseminate ideas and advances in the fight against infectious diseases. It organizes and supports a number of training programs - in both France and the developing world - to ensure that these advances are put into action. The Mérieux Foundation's staff also contribute to several innovative partnerships to support global public health.

LES PENSIÈRES CENTER FOR GLOBAL HEALTH



Les Pensières Center for Global Health - on the shores of Lake Annecy - is the Mérieux Foundation's conference center. A global hub for sharing and discussion, it hosts around 100 scientific conferences and training programs each year, including ADVAC on vaccinology and ACDx on diagnostics (see page 31).

In 2016, over 5,000 professionals, including researchers, health workers, laboratory technicians, manufacturers, and international organization staff, enjoyed this exceptional setting. Les Pensières also hosts professional events for organizations and businesses that share the Mérieux Foundation's values.

DISTANCE LEARNING PORTAL



Global Link for Online Biomedical Expertise (GLOBE) is an online biomedical expertise portal launched by the Mérieux Foundation in 2009, providing distance learning and information for health workers in developing countries.

GLOBE has more than 1,500 active members from 12 communities of practice.

In 2016, three new self-guided training modules were added to the portal - molecular biology, quality, and rabies. GLOBE has in excess of 30,000 visitors every year from almost 200 countries worldwide.

S C I E N T I F I C
C O N F E R E N C E S

The Mérieux Foundation organizes and supports a number of events that aim to accelerate the dissemination of scientific knowledge - conferences on prevention and vaccination, health crisis emergency response meetings, themed events focusing on a specific disease, etc.

These unifying events help to bring to life expert networks and develop synergies between countries in the North and South.

The Foundation organized eleven conferences in 2016, including seven at Les Pensières Center for Global Health.

CONFERENCES
HELD AT LES PENSIÈRESCORRELATES OF ENTERIC
VACCINE-INDUCED
PROTECTION**MARCH 2016**

In partnership with Sanofi Pasteur

➡ More than 60 experts in key scientific disciplines involved in the development of vaccines against enteric diseases (immunologists, statisticians, epidemiologists, regulatory specialists, etc.) worked on a cross-disciplinary action plan to improve the understanding of correlates of protection (i.e. the link between immune response rate and virus protection level).

5TH BETTER FOODS FOR
BETTER HEALTH CONFERENCE**APRIL 2016**

In partnership with Mérieux NutriSciences

➡ These conferences aim to reinforce discussion among researchers, agro-food industry companies and regulatory authorities to address global nutrition challenges. The 2016 edition attracted around 100 participants, who explored the relationship between the gut microbiota and metabolic syndromes, malnutrition, and healthy living.

HUMAN VACCINES PROJECT
SCIENTIFIC COMMITTEE
MEETING**APRIL 2016**

In partnership with the Human Vaccines Project, an international NGO representing academics, charities, manufacturers and the public sector

MECHANISMS BEHIND CHRONIC INFECTIONS:

molecular and cellular mechanisms, evasion mechanisms, immunity

MAY 2016

In partnership with Sanofi Pasteur

STRATEGIES TO INCREASE VACCINE ACCEPTANCE AND UPTAKE

SEPTEMBER 2016

In partnership with Sanofi Pasteur

FORUM ESPACE HUMANITAIRE

OCTOBER 2016

In partnership with the French Red Cross and Fondation de France, and with contributions from NGOs ACTED, CARE France, Handicap International, Première Urgence Internationale, Secours Islamique France, and SOS Villages d'Enfants France

➡ Forum Espace Humanitaire is inspired by the humanitarian action seminars organized in the 1990s by Dr. Charles Mérieux. Held every 18 months, the event brings together the leaders of French humanitarian organizations so they can build the future together, addressing the many and varied issues currently relating to both the basis and principles of humanitarian action. In 2016, around 100 leaders came together at Les Pensières.

ESTIMATING THE FULL PUBLIC HEALTH VALUE OF VACCINES

DECEMBER 2016

In partnership with Sanofi Pasteur

➡ The event built on an initial formal analysis of the public health impact and benefits of vaccines, focusing on two objectives:

- To promote examples of vaccines used in outbreak settings and others used in endemic disease settings,
- To develop communication strategies for health authorities and policy makers.

CONFERENCES HELD ABROAD

THIRD AGING AND IMMUNITY SYMPOSIUM

ITALY, JANUARY 2016

In partnership with GSK

ASIA DENGUE SUMMIT

THAILAND, JANUARY 2016

In partnership with the Asian Dengue Vaccination Advocacy (ADVA) Group, the Dengue Vaccine Initiative (DVI) and NGO Southeast Asian Ministers of Education Organization (SEAMEO)

PARTNERS FOR RABIES PREVENTION

SWITZERLAND, MAY 2016

In partnership with the Global Alliance for Rabies Control (GARC)

VACINOLOGY 2016:

International Symposium for Latin American Experts

BRAZIL, SEPTEMBER 2016

In partnership with Sanofi Pasteur

➡ The conference, attended by more than 100 delegates, aimed to review current vaccination practices in Latin America and to analyze existing global and regional programs and strategies, particularly in light of the advent of the dengue vaccine.



T R A I N I N G P R O G R A M S

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The Mérieux Foundation delivers a number of international, regional and local training programs, tailored to meet the public health priorities of different regions. In addition to the direct advantages that come with skills development, these training initiatives promote discussion, mutual support, and the creation of networks of experts. This interconnection is a key factor which the Mérieux Foundation emphasizes.

The program formats are tailored to local contexts and needs:

INTENSIVE COURSES (ONE OR TWO WEEKS) at Les Pensières, led by international experts in key issues in vaccinology (ADVAC) and diagnostics (ACDx),

DEGREE COURSES such as the three trimester BAMS (Bachelor in Applied Medical Sciences) course in Mali and Haiti, aimed at lab technicians (see page 11),

THEME-BASED MODULES delivered through projects and expert networks supported by the Mérieux Foundation (GABRIEL, RESAOLAB, Quality project, etc.) or to support its partners on the ground (Vaccinology in Africa with the Jenner Institute, WASH water/hygiene/nutrition course organized by the Bioforce Institute, etc.).

VACCINATION-RELATED ISSUES

Advanced Course of Vaccinology **ADVAC**

On May 11-22, 2016, Les Pensières hosted the 17th edition of the Mérieux Foundation's ADVAC course, bringing together 74 students from 39 different countries. Organized in partnership with the University of Geneva, ADVAC addresses the full range of components affecting vaccination programs, in an effort to facilitate local, national, and international decision-making. The course is intended for scientists and decision-makers involved in developing vaccines, new vaccination strategies, and policy-making around the introduction of new vaccines. The 1,000-strong global alumni network gains momentum each year. In 2016, four international meetings were held in conjunction with the ESPID annual meeting in the UK, the SAGE conferences in Switzerland, and the global IDSA annual meeting in the USA.

➔ The program enjoys the support of a wide range of partners: the Bill & Melinda Gates Foundation, the European Commission, WHO, US CDC (Centers for Disease Control and Prevention), ESPID (European Society for Pediatric Infectious Disease), ECDC (European Centre for Disease Prevention and Control), Johns Hopkins Bloomberg School of Public Health, Fogarty International Center, NIAID/NIH (National Institute of Allergy and Infectious Diseases/ National Institutes of Health), and the NVPO (National Vaccine Program Office).

THE ROLE OF DIAGNOSTICS IN PUBLIC HEALTH

Advanced Course on Diagnostics **ACDx**

The 7th ACDx course, delivered in partnership with the London School of Hygiene & Tropical Medicine, took place at Les Pensières on September 4-9, 2016. The program attracted 40 students from 18 countries. The course gives scientists and local decision-makers the information they need to take effective, local action, with an overview of diagnostic test research, development, and deployment. The 2016 course focused specifically on global health security.

➔ The 2016 ACDx course was supported by ASLM (African Society for Laboratory Medicine), WHO TDR (Special Programme for Research and Training in Tropical Diseases), US CDC (Centers for Disease Control and Prevention), US Defense Threat Reduction Agency, Institut Pasteur, bioMérieux, Cepheid, Dong-A ST, and Roche Diagnostics.

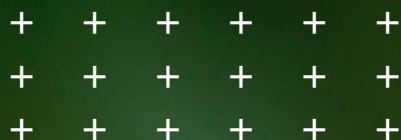
ANTIBIOTIC RESISTANCE

Advanced Course on Antibiotics **AdCAB**

The AdCAB course, organized in partnership with Institut Pasteur, brought together 93 participants from 23 countries, focusing on the issue of antibiotic resistance. The course was supported by Reckitt Benckiser, Institut Mérieux, bioMérieux, Labex IBEID, Wellcome Trust, Pew Charitable Trusts, Merck, Tetrphase, COPAN Diagnostics, ESCMID (European Society of Clinical Microbiology and Infectious Diseases), IRSC (Instituts de recherche en santé du Canada), Aviesan, ITMO I3M, MedImmune, and I2a.



SUPPORT FOR INNOVATIVE PUBLIC HEALTH INITIATIVES



The Mérieux Foundation firmly believes in the importance of collaboration and international, cross-disciplinary synergies. It is a member of several partnerships that offer innovative, constructive solutions to global public health challenges. In 2016, the Mérieux Foundation engaged in the ZikaPLAN consortium to combat the threat of Zika virus.



BUILDING A COMPREHENSIVE RESPONSE TO ZIKA: ZikaPLAN

The Mérieux Foundation is one of 25 research and public health organizations (in Latin America, North America, Africa, Asia, and Europe) that are members of the ZikaPLAN (Zika Preparedness Latin American Network) project.

The initiative is taking a comprehensive approach to the issue, bringing together the various disciplines involved in fighting the disease - epidemiological surveillance, clinical trials, development of diagnostic tools and control strategies, training and knowledge-sharing activities. ZikaPLAN receives funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No. 734584.

The Mérieux Foundation's experience in **diagnostics** supports the innovation and evaluation platform created to develop quick screening tests. The Foundation is involved in training efforts, devising a practical workshop on diagnostic tests, along with an e-learning module that will be published on the GLOBE portal. The Mérieux Foundation is also in charge of communication and disseminating the project's research results.



→ 2 OBJECTIVES

ADDRESSING THE URGENT RESEARCH KNOWLEDGE GAPS

to better understand the disease, prevent its spread and engage with the affected populations

BUILDING A SUSTAINABLE PREPAREDNESS AND RESPONSE CAPACITY

in Latin America for Zika and other emerging infectious diseases

OUTBREAK PREPAREDNESS: GloPID-R

GloPID-R (Global Research Collaboration for Infectious Disease Preparedness) is the only initiative in the world that unites research funding organizations with the aim of accelerating the response to new or re-emerging epidemics with pandemic potential. Working in partnership with the University of Oxford, the Mérieux Foundation is responsible for coordinating the GloPID-R secretariat, which is funded by the European Union's Horizon 2020 program. The secretariat provides governance support for GloPID-R across strategy, organization, finance, administration, and logistics.

New members joined the network in 2016. Four working groups were set up: Zika, yellow fever, Data-Sharing during Public Health Emergencies, and Operational Preparedness and Response Planning.

In 2016, a global workshop was held in Brazil, bringing together leaders of Zika virus research projects funded by GloPID-R members.

GloPID-R: THE STRENGTH OF A NETWORK

26 funding organizations
in 20 countries,
with WHO participating

1 OBJECTIVE:
to facilitate a research response
within 48 hours of an outbreak

HARNESSING THE EXPERTISE OF FIELD PROFESSIONALS: IDEA-Cholera

The Initiative against Diarrheal and Enteric diseases in Africa and Asia (IDEA-Cholera) harnesses the expertise of health workers on the ground involved in cholera and enteric disease control and prevention efforts. The initiative operates as a series of cross-disciplinary regional working groups, which issue recommendations to local public health bodies. Hosted by the Mérieux Foundation and co-funded

by Sanofi Pasteur, in 2015 IDEA was incorporated into the WHO Global Task Force for Cholera Control. In 2016, it was involved in several interventions alongside WHO.



AN INTEGRATED APPROACH TO ELIMINATING DENGUE: PDC



The Partnership for Dengue Control (PDC) was launched in 2013 to help eradicate dengue fever using an innovative approach based on combined vaccination and control of mosquitoes. PDC is an alliance of international organizations and experts supported by the Bill & Melinda Gates Foundation, Sanofi Pasteur, Takeda, bioMérieux, and Bayer.

In 2016, PDC and the University of California, Berkeley organized a workshop at Les Pensières on immunopathology and correlates of protection. An international think tank also looked at diagnostics and the development of standard tests to diagnose the most severe cases. There was a step-up in communication activities, including an online awareness video and Twitter campaign showing action in endemic countries and at research centers. PDC has developed an interactive map showing the main global and regional players in dengue fever control.

CREATION OF THE GDAC CONSORTIUM

In 2016, PDC and the Dengue Vaccine Initiative (DVI) created the Global Dengue and Aedes-transmitted Diseases (GDAC) Consortium. GDAC is a global alliance that aims to incorporate different control approaches against diseases transmitted by the Aedes mosquito (including dengue, Zika virus disease, chikungunya, yellow fever and Japanese encephalitis).

A GLOBAL EPIDEMIOLOGICAL SURVEILLANCE NETWORK: CORDS



Connecting Organizations for Regional Disease Surveillance (CORDS) is a “meta-network”, funded by the Skoll Global Threats Fund and the Rockefeller Foundation that brings together six regional epidemiological surveillance networks in Africa, Asia, the Middle East, and Europe.

A seventh network is currently being set up in West Africa, in partnership with the West African Health Organisation (WAHO) and in coordination with the Mérieux Foundation’s RESAOLAB network.

Since October 2016, CORDS has been calling the Mérieux Foundation’s premises its home. The Mérieux Foundation has been providing its support as a member of the Board of Directors alongside the Skoll Global Threats Fund, the Rockefeller Foundation, the Bill & Melinda Gates Foundation, and the Nuclear Threat Initiative (NTI).

A black and white photograph of a woman and a young child. The woman is in the foreground, wearing a headscarf with a decorative pattern, looking off to the side. The child is behind her, looking towards the camera. A green circle is overlaid in the top right corner, containing the text "MOTHER AND CHILD PROJECTS" in white, bold, uppercase letters.

**MOTHER AND CHILD
PROJECTS**

COMBATING ALL FORMS OF POVERTY

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.

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.

OPENING OF ERBIL MEDICAL CENTER

The Pauline-Marie Jaricot Mother and Child Medical Center was inaugurated on December 7, 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 the center was overseen by the Mérieux Foundation, working with the refugee camp from which the architects and center staff were sourced. The Mérieux Foundation funded the infrastructure, installed the equipment and helped train the staff, whose wages are paid by the Iraqi

government. The project received financial support from Œuvres Pontificales Missionnaires de Lyon and Fondation Saint-Irénée.

CREATION OF AN INCOME-GENERATING ACTIVITY

At the Mar Elia refugee camp near Erbil, the Mérieux Foundation helped **build a bakery and pastry production facility and set up the business**, which the refugees took over in 2016.

AN 800 M² PLAYGROUND AND SPORTS FIELD

The sports field at the Saint-Irénée school in Iraqi Kurdistan opened in January 2016. The school was built in 2015 by a partnership that included the Mérieux Foundation.



MADAGASCAR



ACCESS TO HYGIENE AND HEALTHCARE

In Madagascar, the Mérieux Foundation is working with several local charities, such as **Akamasoa** (which means “good friends”). Founded around 30 years ago by Father Pedro, the charity currently helps more than 20,000 people in Antananarivo, providing housing, education for children, healthcare facilities and, in many cases, employment. In 2016, the Mérieux Foundation helped renovate part of the emergency shelter for homeless people. It also worked with Father Pedro

on health education initiatives, as well as access to care for around 5,000 secondary school children. The Mérieux Foundation contributes to the **Solidarity Fund for Underprivileged Children and Women**, which has so far provided medical care to more than 700 children. The Foundation has also set up a **health education program** for charities working with socially marginalized children, covering hygiene and prevention of tuberculosis, sexually transmitted infections, and addictions.

A NEW STUDENT CENTER

In 2016, the Mérieux Foundation renovated a training and support center for young female students in Antananarivo, named “Maison Bénédicte” in memory of Dr. Bénédicte Contamin, former Mérieux Foundation head in Madagascar. The center will provide student accommodation, training and a retreat, as well as act as the mission house for the Communauté du Chemin Neuf - an ecumenical Catholic community.

MALI



SCIENCE EDUCATION PROGRAM

In 2015, the Mérieux Foundation’s **GABRIEL network** joined forces with **Fondation La Main à la Pâte**, to launch a science and health education pilot program in primary schools in Mali. The project, which aims to provide support to teachers and introduce hands-on learning methods, began in 2016 with two training sessions for trainers and teaching staff

at eight primary schools in Bamako. Two project coordinators were also appointed on behalf of Mali’s Ministry of National Education.

HAITI

The Mérieux Foundation has been **working in Haiti since 2002, particularly with the GHESKIO Centers** (Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections) in Port-au-Prince, as well as several support facilities in partnership with Fondation Christophe et Rodolphe Mérieux. After Hurricane Matthew in 2016, the Mérieux Foundation also helped provide **emergency assistance**: distributing cholera kits, foodstuffs, and medical supplies.



MICRO-CREDIT SUPPORT

The Mérieux Foundation and Fondation Christophe et Rodolphe Mérieux are working with ACME (Association for the cooperation with the micro-enterprise) - a financial institution that offers micro-credit services to the Haitian population. In 2005, the partners launched the **"MAG" (Mérieux-ACME-GHESKIO) loan for women living with or vulnerable to HIV** treated at the GHESKIO Centers. To date, the initiative has supported more than 4,500 women.

ASSISTING SUPPORT FACILITIES IN HAITI

Notre Dame de la Médaille Miraculeuse children's home in Cap Haitien: projects aiming to increase capacity and improve living conditions (covering the cost of buying foodstuffs and medical care).

Village de Nazareth in Leogane: help with the orphanage's running costs and education program.

Klib Timoun Kè Kontan (Center of Hope) training center in Verrettes: help setting up income-generating activities.

Salines dispensary in Jacmel: help with operations and running costs for the dispensary founded in March 2013 by Aides Actions Internationales Pompiers.

MALI / PERU / SENEGAL

PARTNERSHIP WITH SAMUSOCIAL

Samusocial International works on the ground to help street children who face social exclusion and marginalization in capital cities in developing countries. The Mérieux Foundation is a partner of Samusocial in Mali, Senegal and Peru, supporting education and health programs and providing operational support for mobile assistance, day support facilities

(healthcare and psychosocial support activities), as well as emergency shelter. In 2017, the Foundation is expanding its partnership to other countries, including Congo-Brazzaville.

There are other ongoing Mother and Child initiatives in the countries where the Mérieux Foundation works, including Cambodia and Bangladesh (rickets program), as well as health, hygiene, and water treatment support and education (see country overviews on pages 38 to 49).

THE MÉRIEUX FOUNDATION WORLDWIDE



• BENIN • BURKINA FASO • GUINEA • MADAGASCAR • MALI • NIGER • SENEGAL •
• TOGO • BRAZIL • HAITI • BANGLADESH • CAMBODIA • CHINA • LAOS •
• MYANMAR • IRAQ • IRAN • LEBANON • TAJIKISTAN •

AFRICA

BENIN

- Mérieux Foundation office:
2 Beninese employees
- RESAOLAB network member
since 2013

IN 2016

RESAOLAB PROGRAM ACTIONS

- Renovation and equipping of the practical workrooms of the École Polytechnique d'Abomey-Calavi (EPAC)
- Supervision of 21 laboratories and participation of 10 laboratories in an external quality assessment program
- Training of 195 professionals through 9 training modules, including one specific to the response to the 2016 cholera epidemic in Benin
- Biomedical maintenance training for 15 technicians from West African countries, including 3 Beninese; conducted in the framework of a partnership with the Ecole Polytechnique d'Abomey-Calavi (EPAC)
- Scholarships: 1 technician for the Bachelor of Science in Biological and Applied Medical Sciences (BAMS) Mali and 2 students for the DES in Medical Biology (in year 3)
- Launch of construction for the External Quality Control Laboratory and the future National Laboratories Directorate

BURKINA FASO

- Mérieux Foundation office:
1 Burkinabe employee
- RESAOLAB network member
since 2009:
 - Construction of the Continuing Training Center and External Quality Control Unit in Ouagadougou, within the General Directorate of Pharmacy, Drugs and Laboratories, inaugurated in 2013
 - Renovation and equipping of 3 other continuing training centers: Bobo-Dioulasso (DRS), Ouahigouya (Lazaret Medical Center) and Fada N'Gourma (Regional Hospital)
 - Renovation of the laboratory and practical workrooms of the Faculty of Pharmacy of Ouagadougou in 2014



IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Participation in the SOCIALAB study: historical and anthropological research on the development and current status of medical laboratory services in national health systems in Burkina Faso, Mali and Senegal



RESAOLAB PROGRAM ACTIONS

- Organization in Ouagadougou of the WARDS regional workshop and RESAOLAB regional technical workshops in May
- Support and participation in the Burkina Faso Biology Days in July
- Assessment of the policy and strategic plan for laboratories
- 2 external quality evaluation sessions organized for 117 public and private laboratories
- Organization of a Quality Control course in partnership with Oneworld Accuracy
- Supervision of 121 laboratories
- 2 training modules (management of a laboratory and prescription of biomedical examinations) delivered to almost 100 physicians and pharmacists
- Scholarships: 2 technicians for BAMS Mali, 2 students for the DES in Medical Biology and 2 technicians for biomedical maintenance training in Cotonou

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AFRICA**GUINEA**

- First Mérieux Foundation mission in 2010
- Mérieux Foundation office: 1 expatriate and 3 Guinean employees
- RESAOLAB network member since 2013

IN 2016**SUPPORT FOR CLINICAL BIOLOGY LABORATORIES**

■ Launch, end 2016, of the LABOGUI project aiming to help establish a national clinical biology policy by: enhancing the institutional framework; improving conditions for performing clinical biology; making laboratory management more professional and improving the clinical biology practices of laboratory personnel

■ Continuation of the LAB-NET project for surveillance of priority pathogens in Guinea: more than 105 laboratories assessed across the country

■ Support for the Coronthie Women and Children's Health Center in Conakry: supervision by Prof. Diallo of the Charles Mérieux Center for Infectious Disease of Mali

RESAOLAB PROGRAM ACTIONS

■ Scholarships: 2 technicians for the Bachelor of Science in Biological and Applied Medical Sciences (BAMS) in Mali and 2 students for the DES in Medical Biology

■ Training sessions for trainers in the RESAOLAB network at the Institut de Perfectionnement Professionnel en Santé (IPPS)

■ Training sessions on modules on pre and post-analytical testing phases and Ebola for 246 professionals

MADAGASCAR

- First Mérieux Foundation mission in 2006
- Mérieux Foundation office: 3 Malagasy employees
- Charles Mérieux Center for Infectious Disease with a Rodolphe Mérieux Laboratory* within the University of Antananarivo (2010)
- One GABRIEL network member: University of Antananarivo
- Renovation of 9 clinical biology laboratories since 2007

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Leprosy
- Chromomycosis and sporotrichosis
- Multidrug-resistant bacteria
- Bacterial meningitis
- Human papillomavirus (HPV)

IN 2016**SUPPORT FOR CLINICAL BIOLOGY LABORATORIES**

■ Technical support for establishing a Malagasy network of public hospital laboratories (RESAMAD)

■ Deployment of a Laboratory Information Management System and training in 9 laboratories

■ Continued development and empowerment of the bacteriology laboratory at the Joseph Raseta Befelatanana Hospital (HJRB)

■ Management of tuberculosis case contacts in the Analamanga region

■ Official recognition of the Charles Mérieux Center for Infectious Disease as a national reference laboratory for leprosy

■ Assessment of HIV viral load at the Charles Mérieux Center for Infectious Disease for the cohort of 300 patients receiving care at the HJRB

■ Support for the pharmacy studies program created by the Mérieux Foundation in 2006: training to strengthen the capacities of hospital pharmacists

ENHANCING RESEARCH CAPABILITIES

■ Molecular surveillance of resistance of *Mycobacterium leprae* to leprosy drugs

■ Chromomycosis and sporotrichosis in Madagascar: epidemiology, mycological and molecular diagnosis and characterization of environmental factors

■ Monitoring of pediatric and adult bacterial meningitis in Antananarivo

■ Assessment of the endemicity rate for intestinal bilharzia by *Schistosoma mansoni* in the Haute Matsiatra region

GABRIEL NETWORK MULTI-CENTER STUDIES:

■ Testing of tools for bacterial meningitis diagnosis using real-time multiplex PCR

SUPPORT FOR LOCAL INITIATIVES

■ Access to hygiene for destitute people in Madagascar alongside the Akamasoa association: construction of waste containers, latrines, urinals and a water tank*

■ Access to care for those in need through local associations and NGOs: paying hospitalization costs and providing medicine

■ Training in health education for the most vulnerable families, in partnership with school medical services and child protection associations

AFRICA

MALI

- First Mérieux Foundation mission in 2003
- Mérieux Foundation office: 1 expatriate and 7 Malian employees
- Charles Mérieux Center for Infectious Disease with a Rodolphe Mérieux Laboratory* in Bamako (2005)
- One GABRIEL network member: Charles Mérieux Center for Infectious Disease
- RESAOLAB network member since 2009; renovation and equipping of training sites (in 2010):
 - Kayes (with support from the International Cooperation of the Principality of Monaco) and Mopti regional hospital laboratories
 - Practical workrooms in the National Institute of Training in Health Sciences (INFSS) in Sikasso
 - Multimedia rooms at the INFSS in Kayes (with support from the International Cooperation of the Principality of Monaco) and in Sikasso
 - National Quality Control Unit (UNEEQ) at the National Institute of Research in Public Health (INRSP)

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Tuberculosis
- Hepatitis B
- Respiratory infections



IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Development of specialized biology activities and technology transfer for the biological monitoring of viral hepatitis
- Development of the technical capacities of the Charles Mérieux Center for Infectious Disease: implementation of a BSL3 laboratory dedicated to diagnosis and research on tuberculosis and other dangerous viruses
- Continuation of the mobile laboratory project, in partnership with the German Partnership Programme for Excellence in Biological and Health Security, the Bundeswehr Institute of Microbiology and the GIZ (German Federal Enterprise for International Cooperation): second successful deployment exercise and continuation of the technical training sessions
- A related project was set up for the Sahel G5 Biosafety Network to strengthen the capacity of the Sahel G5 countries to respond better to biological threats. Experts in biology from the Sahel G5 countries were trained at the end of 2016 in biosecurity and biosafety, as well as modern diagnostic methods, on the mobile laboratory in Mali. The project continues in 2017.
- Support for the LABOMEDCAMP project, aimed at improving the quality of infectious disease diagnosis in front-line laboratories in Mali
- Contribution to the GHSA (Global Health Security Agenda) in 2016 through the evaluation of laboratories in 3 regions of Mali
- Participation in the dissemination of the results of the SOCIALAB study: historical and anthropological research on the development and current status of medical laboratory services in national health systems in Burkina Faso, Mali and Senegal
- Start of the 10th class of the Bachelor of Science in Biological and Applied Medical Sciences (BAMS): 24 students from 8 countries. The BAMS training will become a Master 1 within the University of Bamako from September 2017.
- Scholarships:
 - 5 technicians for BAMS
 - 2 pharmacists for the DES in Medical Biology of Dakar and Ouagadougou
 - 2 technicians for biomedical maintenance training in Cotonou
- Training of 35 physicians in prescribing biomedical examinations

*With support from
Fondation Christophe et Rodolphe Mérieux

+++++ AFRICA

MALI



ENHANCING RESEARCH CAPABILITIES

■ **Research Partnership:** 3 signing ceremonies as part of the establishment of a research cooperation agreement between the Chinese Academy of Medical Sciences (CAMS), the Charles Mérieux Center for Infectious Disease of Mali and the Mérieux Foundation

■ **Fever etiology surveillance in Mali**
This study is jointly carried out by the Charles Mérieux Center for Infectious Disease, the Institute of Microbiology of the Bundeswehr, the pediatric departments of Gabriel Touré Hospital and the Hospital of Mali. It is sponsored by the German Partnership Programme for Excellence in Biological and Health Security of the German Ministry of Foreign Affairs. The objective is to study the infectious etiologies of acute or prolonged febrile syndromes to improve their diagnosis, treatment, prevention and control in Mali.

■ **Evaluation of the hepatitis B viral load of blood donors in Bamako**

This study is conducted in collaboration with the National Center for Blood Transfusion in Mali. The aim is to evaluate the viral load of hepatitis B infection in blood donors in Bamako.

GABRIEL NETWORK MULTI-CENTER STUDIES:

■ **Study of the dynamics and composition of the intestinal microbiota in children in Mali**

■ **Quality Initiative:** Mali is one of four pilot sites for the quality initiative to enable GABRIEL member laboratories to meet the international accreditation requirements for ISO 15189

■ **Training of 20 people in molecular immunology at the Charles Mérieux Center for Infectious Disease in May, based on a general education module developed at the Emerging Pathogens Laboratory in Lyon**

TRAINING AND KNOWLEDGE-SHARING

■ **Bioforce training:** in 2016, the Charles Mérieux Center for Infectious Disease hosted several Bioforce Africa Institute training sessions, including the integrated training program “Water-Hygiene-Sanitation project manager” and “Nutrition project manager”

SUPPORT FOR LOCAL INITIATIVES

■ **Partnership with Samusocial International*** to assist children living in the streets of Bamako. The Mérieux Foundation's support contributes to the functioning of mobile help teams, day centers with care and psychosocial assistance activities, as well as emergency shelter.

■ **Support to the NGO Djantoli*** to facilitate access to quality primary care for children under 5 years in Commune IV in Bamako

■ **Pilot program for science and health education in primary schools in Mali**

**With support from
Fondation Christophe et Rodolphe Mérieux*

AFRICA

NIGER



- First Mérieux Foundation mission in 2012
- Mérieux Foundation office: 1 Nigerien employee
- RESAOLAB network member since 2013

IN 2016

RESAOLAB PROGRAM ACTIONS

- Construction of the Health Laboratories Directorate and the External Quality Assessment Unit in Niamey
- Equipment support at the CERMES Training Center
- Construction of a training center at the Zinder Mother-Child Health Center
- Scholarships: 6 technicians for BAMS, 1 pharmacist and 1 doctor for the DES in Medical Biology in Ouagadougou, 2 technicians for training in biomedical maintenance in Cotonou and 1 technician in metrology
- 3 training modules (epidemic-prone diseases, microscopy and chronic diseases) were delivered to approximately 60 laboratory technicians
- Post-training laboratory supervision



SENEGAL



- First Mérieux Foundation mission in 2009
- Mérieux Foundation office: 1 expatriate and 2 Senegalese employee
- RESAOLAB network member since 2009:
 - Support for the creation of a National Laboratories Directorate (2013)
 - Renovation of continuing training centers in Thies, Kaolack (2014)

IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Continuation of the I-Lab project to develop a tool dedicated to automating the collection of epidemiological data from laboratories, developed in partnership with the NGO PATH and the Skoll Foundation
- Dissemination of the SOCIALAB study results, the objective of which is to understand the social, cultural and historical factors limiting support to laboratory services in prenatal care. The project is based on historical and anthropological research conducted in 2015 on the development and current status of medical laboratory services in national health systems in Burkina Faso, Mali and Senegal. The project's partner is the Amsterdam Institute for Global Health and Development.
- Development of a project to strengthen the activities of the Laboratories Directorate in consortium with PATH and funded by the US Centers for Disease Control and Prevention and the Global Health Security Agenda

RESAOLAB PROGRAM ACTIONS

- Supervision of 20 laboratories
- Supervision sessions and collection of antimicrobial resistance data in 18 laboratories
- External quality assessment inspection for 48 laboratories specialized in bacteriology and 8 biochemistry laboratories
- Scholarships: 8 technicians for BAMS Mali, 6 doctors or pharmacists for the DES in Medical Biology, 2 technicians for biomedical maintenance training and 2 technicians for the training in metrology
- Training of laboratory technicians: 7 sessions on culture media preparation and dyes (177 participants)
- Training on the LabBook LIMS at 14 pilot labs
- Update of the laboratory techniques handbook by the Laboratories Directorate

SUPPORT FOR LOCAL INITIATIVES

- Partnership with Samusocial International of Senegal, which provides assistance to the children living in the streets of Dakar. The Mérieux Foundation* contributes to the operation of mobile help teams, day centers with care and psychosocial assistance activities, as well as emergency shelter.

AFRICA

TOGO



- First Mérieux Foundation mission in 2012
- Mérieux Foundation office: 2 Togolese employees
- RESAOLAB network member since 2013

IN 2016

RESAOLAB PROGRAM ACTIONS

- Training of auditors and laboratory quality assurance managers
- Implementation of a pilot external quality assessment session in 11 laboratories
- Second training of trainers in the RESAOLAB network
- Scholarships: 1 student in the DES in Medical Biology in Dakar, 2 biology engineers in the Quality Master in Lomé, 2 biology engineers for training in biomedical maintenance in Cotonou and 1 engineer for metrology training
- Construction of the Directorate of Pharmacy, Medicine and Laboratories attached to the Ministry of Health and Social Welfare of Togo and rehabilitation of the practical training rooms of the Graduate School of Biological and Food Technology and the Faculty of Health Sciences

ENHANCING RESEARCH CAPABILITIES

- Second phase of the PneumoTone study on etiologic agents responsible for pneumonia in a cohort of patients with respiratory diseases in the city of Dapaong

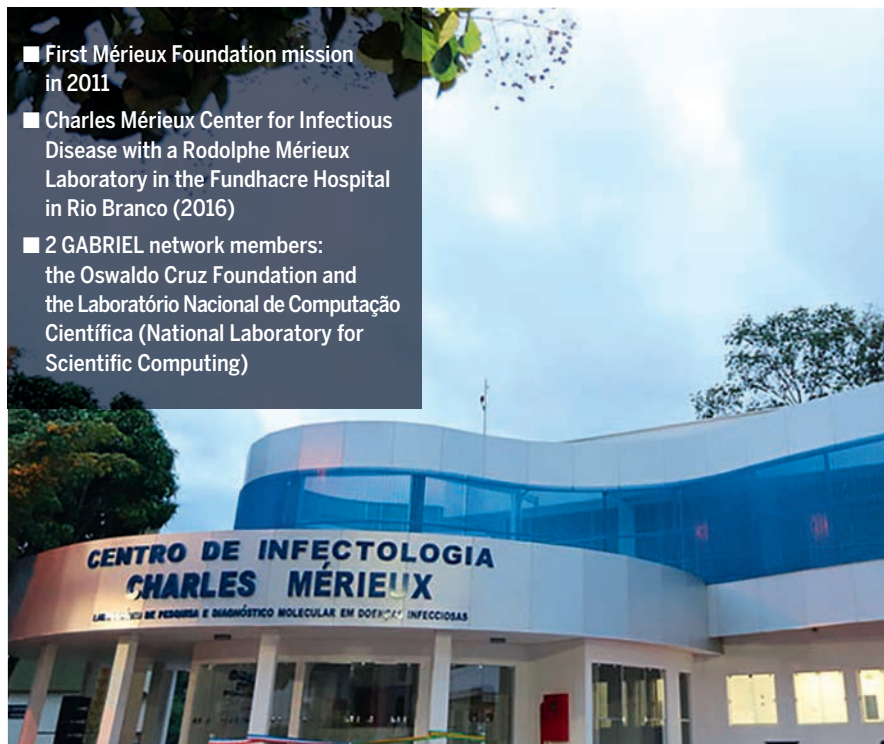
**With support from
Fondation Christophe et Rodolphe Mérieux*

AMERICAS

BRAZIL



- First Mérieux Foundation mission in 2011
- Charles Mérieux Center for Infectious Disease with a Rodolphe Mérieux Laboratory in the Fundhacre Hospital in Rio Branco (2016)
- 2 GABRIEL network members: the Oswaldo Cruz Foundation and the Laboratório Nacional de Computação Científica (National Laboratory for Scientific Computing)



IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Inauguration in April of the Charles Mérieux Center for Infectious Disease and the Rodolphe Mérieux Laboratory in Rio Branco, within the Fundhacre Hospital

ENHANCING RESEARCH CAPABILITIES

- Participation in the ZikaPLAN consortium kick-off meeting in Recife in October
- GloPID-R: Organization of an international workshop on Zika virus research projects funded by consortium members

GABRIEL NETWORK MULTI-CENTER STUDIES:

- Deployment in June of a self-assessment questionnaire on the quality assurance system, in collaboration with the Oswaldo Cruz Foundation

- Study of the active surveillance of severe influenza cases in hospitalized patients carried out at two Brazilian clinical sites (Fortaleza and Curitiba), in collaboration with the Global Influenza Hospital Surveillance Network and in partnership with Sanofi Pasteur

SUPPORT FOR LOCAL INITIATIVES

- Establishment of a partnership with Chief Almir for the construction of a center for training and the preservation of health knowledge of the Amazon's Surui tribe

AMERICAS

HAITI

- First Mérieux Foundation mission in 2002
- Rodolphe Mérieux Laboratory*: BSL3 level lab within the Institute of Infectious Diseases and Reproductive Health (IMIS) part of the GHESKIO Centers (Haitian Group for the Study of Kaposi's Sarcoma and Opportunistic Infections) in Port-au-Prince (2009)
- Centers GHESKIO members of the GABRIEL network
- Bachelor of Applied Medical Biology - BAMS (2011)
- Public health project for the development of laboratories - SPHaïtiLab (2015)

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Tuberculosis
- HIV/AIDS
- Microbiology and bacterial resistance



IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Continuation of the SPHaïtiLAB project for strengthening the laboratory network:
 - Recruitment of additional qualified personnel at the National Public Health Laboratory, including a research coordinator, a biosafety officer, a technician for the Laboratory Information Management System and a communications officer
 - Assessment of 30 laboratories, carried out in all the departments of the country
 - Assessment of the former "Five-Year Strategic Plan of the National Laboratory Network 2010-2015"
 - Drafting of the National Laboratory Policy is being finalized
 - Study on multidrug-resistant tuberculosis at five sites in the country by GHESKIO Centers
- Support to the molecular biology laboratory: reinforcement of HIV viral load quantification and implementation of Zika virus diagnosis

ENHANCING RESEARCH CAPABILITIES

- Quality initiative: Haiti is one of 4 pilot sites for an initiative designed to help GABRIEL member laboratories meet the requirements for international ISO 15189 accreditation. Carrying out a "blank" audit in view of this forthcoming accreditation.
- Training of 30 laboratory personnel in molecular biology based on a module developed by the Emerging Pathogens Laboratory in Lyon

TRAINING AND KNOWLEDGE-SHARING

- Start in September of the 6th class of the Bachelor of Science in Biological and Applied Medical Sciences (BAMS)
- Health education training: creation of a module in primary schools on the theme of water (in partnership with the Academy of Sciences)

SUPPORT FOR LOCAL INITIATIVES

- 11th year of the micro-credit loan program (set up in collaboration with the Association for Cooperation with Micro-Enterprise) for vulnerable Haitian women living with or vulnerable to HIV (more than 8,900 loans to more than 4,000 women since 2005)*
- Support for the children's home in Leogane (Communauté de l'Incarnation): construction of buildings (chicken coop, pigsty and new home) and development of income-generating activities*
- Support for the children's home in Cap Haitien (Our Lady of the Miraculous Medal): medical care and food aid*
- Support for the Klib Timoun Kè Kontan association for disadvantaged children: continuation of pig farming as an income-generating activity*
- Support for the French AAIP (firefighter's international aid actions) association's Saline dispensary activities in Jacmel*
- Emergency support after hurricane Matthew: community awareness and distribution of cholera kits, medicines, food kits and roof tarpaulins

ASIA

BANGLADESH

- First Mérieux Foundation mission in 2009
- Rodolphe Mérieux Laboratory* in Chittagong, within the Bangladesh Institute of Tropical and Infectious Diseases - BITID (2015)
- 2 GABRIEL network members: the iccdr,b (International Centre for Diarrhoeal Disease Research) and the ideSHi (Institute for developing Science and Health initiatives)

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Tuberculosis ■ Typhoid

IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Launch of support for Shyanmnagar hospital, in partnership with the NGO Friendship
- **Development of BITID:**
 - Quality Initiative Program: support for internal quality control
 - Strengthening of the BITID laboratory platform: purchase of a system for gel electrophoresis and reinforcement of the microbiology platform
 - Development of microbiology diagnostic capacity for the fight against antimicrobial resistance, with GHSA funding

ENHANCING RESEARCH CAPABILITIES

- Launch of the ZIKAGEIS project on the role of the Zika virus in the etiology of Guillain-Barré syndrome, with support from the US Naval Medical Research Unit (NAMRU / NMRC) and the Fondation AnBer

*With support from
Fondation Christophe et Rodolphe Mérieux

Development of BITID:

- Workshop on "The Role of the BITID in Supporting Diagnosis and Laboratory Research in the Chittagong Division", July 17-19
- Practical training in medical biology at BITID, in partnership with BSF: February 21 - March 4
- Biosafety training through a partnership with iccdr, b

GABRIEL NETWORK MULTI-CENTER STUDIES:

- Study of the transmission of tuberculosis in prisons with the aim of improving early detection and control of the epidemic in Bangladeshi prisons
- Project to develop a global database for the rapid identification of pathogens through next generation sequencing, funded by the European Union through the Horizon 2020 program, within the framework of the Mérieux Foundation's partnership with the COMPARE consortium
- Theoretical and practical training of eight people on the use of a molecular test for the diagnosis of first-line anti-tuberculosis drug resistance, held at the Bangladesh Institute of Tropical & Infectious Diseases in Chittagong

SUPPORT FOR LOCAL INITIATIVES

- Construction of a health center on the island of Maeshkali, offering complete and quality care in order to improve population health, in partnership with the NGO AMD (Medical Assistance to Development), Fonds pour Eux and SARPV (Social Assistance and Rehabilitation for the Physically Vulnerable)

CAMBODIA

- First Mérieux Foundation mission in 2001
- Mérieux Foundation office: 2 Cambodian employees
- Rodolphe Mérieux Laboratory* within the Faculty of Pharmacy of Phnom Penh (opened in 2005 and renovated in 2016)
- New regional platform for research on infectious diseases on the Institut Pasteur campus in Phnom Penh in 2014 (part of the Mérieux Foundation's membership in the Avisean Sud scientific network)
- Reconstruction of the Faculty of Pharmacy in Phnom Penh in partnership with the Pierre Fabre Foundation in 2003
- 9 clinical biology laboratories renovated since 2007
- One GABRIEL network member: the University of Health Sciences in Phnom Penh

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Respiratory infections
- Hepatitis
- Environmental pathogens



ASIA



CHINA



IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Launch of the research project on the prevalence of hepatitis C in people living with HIV and pregnant women in Cambodia
- Support for CamLab, the national network of Cambodia's medical biology laboratories: organization of the external quality control program EQA at 39 laboratories, including 5 private ones
- Renovation of the Rodolphe Mérieux Laboratory in Phnom Penh
- Renovation of the microbiology laboratory at Battambang Hospital

ENHANCING RESEARCH CAPABILITIES

- PCR technology as a detection tool for invasive pneumococcal disease: study to determine the characteristics of invasive pneumococcal disease and the colonization in Cambodian children before and after introduction of the pneumococcal vaccine on a national scale (PCV13)

- Hepatitis C mono-infection (HCV) and HIV-HCV co-infection in Cambodia: assessing the prevalence of HCV and its subtypes in people living with HIV and in pregnant women going to prenatal clinics

- Virological and epidemic study of the epidemic dynamics of influenza viruses in Cambodia: phenotypic and genotypic characterization of influenza viruses responsible for severe pneumonia

GABRIEL NETWORK MULTI-CENTER STUDIES:

- Molecular biology training for 30 laboratory professionals, based on a module developed by the Emerging Pathogens Laboratory in Lyon

SUPPORT FOR LOCAL INITIATIVES

- Support for the NGO 1001 Fontaines for its research on pesticide levels in drinking water production in Cambodia*
- Support for the "Dr. Christophe Mérieux Center" in Phnom Penh to offer young people from disadvantaged backgrounds the opportunity to pursue higher education*

- First Mérieux Foundation mission in 2006
- Mérieux Foundation office: 3 Chinese employees
- Christophe Mérieux Laboratory* within the Institute of Pathogen Biology at the Chinese Academy of Medical Sciences (CAMS) in Beijing (2008)
- One GABRIEL network member: the Institute of Biology at the Chinese Academy of Medical Sciences (CAMS)
- 3rd international foundation to be officially recognized by the Chinese Ministry of Health in 2014

CHRISTOPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Pneumonia ■ Tuberculosis

IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Continuation of the program to decentralize tuberculosis diagnosis* through a partnership between the Mérieux Foundation and the Chinese Ministry of Health

ENHANCING RESEARCH CAPABILITIES

- Research partnerships: 3 signing ceremonies for research cooperation agreements between the Chinese Academy of Medical Sciences (CAMS), the Charles Mérieux Center for Infectious Disease of Mali and the Mérieux Foundation
- CARE project (China Against Drug Resistance) which strengthens the rational use of antibiotics and the control of nosocomial infections: launch of the program in two hospitals and training of staff to carry out the prevalence survey

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ASIA**LAOS**

- First Mérieux Foundation mission in 2005
- Mérieux Foundation office: 3 expatriates, including one based at the Provincial Directorate of Health in the Khammouane province
- Center of Infectiology Lao Christophe Mérieux and Rodolphe Mérieux Laboratory* on the Ministry of Health's scientific campus, with the Pasteur Institute of Laos, the Institut de la Francophonie pour la Médecine Tropicale and the University of Health Sciences (2009)
- 9 clinical biology laboratories renovated, including 8 in the Khammouane province in 2013
- One GABRIEL network member: the Ministry of Health

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- HIV/AIDS
- Chronic viral hepatitis
- Viral respiratory infections and tuberculosis
- Human papillomavirus (HPV)

**IN 2016****SUPPORT FOR CLINICAL BIOLOGY LABORATORIES**

- Continuation of the Lab Kham project to strengthen the laboratory system in the Khammouane province: continuing education of the staff of 10 laboratories and training of physicians in prescribing biological analyses
- Continued support and technical accompaniment for the Center of Infectiology Lao Christophe Mérieux
- The Center of Infectiology Lao Christophe Mérieux is a partner of national HIV and tuberculosis programs and a reference laboratory for the follow-up of people living with HIV and chronic viral hepatitis

ENHANCING RESEARCH CAPABILITIES

- Lao PDR (Primary Drug Resistance) project: to determine the primary resistance to HIV drugs in treatment-naïve patients
- LaoCol-VP project* (cost-effectiveness study of techniques to detect cervical cancer): surgical treatment for patients and monitoring of patients with human papillomavirus infection at high risk for cancer
- TDR vs ELISA: evaluating the effectiveness of rapid tests for the diagnosis of hepatitis B
- Study of the prevalence of hepatitis B in pregnant women in Vientiane: prevention of materno-fetal transmission of hepatitis B virus
- Quality initiative: Laos is one of 4 pilot sites for an initiative designed to help GABRIEL member laboratories meet the requirements for international ISO 15189 accreditation

GABRIEL NETWORK MULTI-CENTER STUDIES:

- ID-Bio International Research Group: Molecular Epidemiology of Tuberculosis in Southeast Asia
- LaCoRIS project on surveillance of respiratory infectious diseases in cohorts in Vientiane: end of patient recruitment and biological testing
- Molecular biology training to strengthen and update basic scientific knowledge, carried out at the Center of Infectiology Lao Christophe Mérieux in Vientiane (11 participants)

TRAINING AND KNOWLEDGE-SHARING

- Eighth meeting of the GABRIEL network organized July 5-8
- Symposium on antimicrobial resistance at the beginning of the GABRIEL meeting
- Organization at the Center of Infectiology Lao Christophe Mérieux of the 2nd Regional Symposium / 5th National Workshop on Chronic Viral Hepatitis on the theme, "Towards the Healing of Chronic Hepatitis"
- Organization at the Center of Infectiology Lao Christophe Mérieux of the 9th National Workshop on HIV

PROVIDING EXPERTISE

- Supervision, for the Laotian Ministry of Health, of the construction of the Food Safety Laboratory, a national reference center for food quality control, with support from Mérieux NutriSciences

*With support from
Fondation Christophe et Rodolphe Mérieux

ASIA

MYANMAR



- First Mérieux Foundation mission in 2010
- 1 Burmese employee
- Renovation of 3 units within the Public Health Laboratory between 2011 and 2014 (the molecular biology, bacteriology and virology laboratories)*

IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Establishment of HIV viral load measurement at the Yangon National Health Laboratory (NHL), the Public Health Laboratory (PHL) in Mandalay and Dawey: 23,350 tests performed in total, as well as theoretical and practical training
- Continued support for the development of microbiology at the Mandalay PHL
- Accompanying the construction of the new national public health laboratory in Yangon: drawing up the design and budget for the building



MIDDLE EAST

IRAQ



- First Mérieux Foundation mission in 2014

IN 2016

SUPPORT FOR LOCAL INITIATIVES

- Inauguration in Erbil of the Pauline-Marie Jaricot Mother and Child Center, in partnership with Œuvres Pontificales Missionnaires de Lyon and Fondation Saint-Irénée
- Construction of a medical laboratory in the IDP camp in Bardarash, in partnership with the NGO Première Urgence Internationale
- Construction underway of a health center in the Darkar camp, in partnership with the association EliseCare
- Inauguration of a playground and sports field, and purchase of uniforms for the Saint-Irénée school built in 2015 in Iraqi Kurdistan for displaced children
- Development of an income-generating activity in the Mar Elia camp: construction of a bakery and pastry production facility

IRAN



- First Mérieux Foundation mission in 2015

IN 2016

SUPPORT FOR CLINICAL BIOLOGY LABORATORIES

- Feasibility study for the construction of a diagnostic and surveillance laboratory in Zahedan, in partnership with the University of Zahedan and the Pasteur Institute of Iran. The laboratory would be intended in particular to provide diagnostic services to the numerous refugees in the region

ENHANCING RESEARCH CAPABILITIES

- Training of three scientists from the Pasteur Institute of Iran for two months at Lyonbiopôle

LEBANON



- First Mérieux Foundation mission in 2008
- 2 expatriates
- Rodolphe Mérieux Laboratory* within the Technology Center of the Saint Joseph University in Beirut (2011)
- One GABRIEL network member: Saint Joseph University

RODOLPHE MÉRIEUX LABORATORY RESEARCH FOCUS:

- Pneumonia

IN 2016

ENHANCING RESEARCH CAPABILITIES

GABRIEL NETWORK MULTI-CENTER STUDIES:

- PEARL (Pneumonias' Etiology Among Refugees and Lebanese Population): study on the etiology of respiratory infections among Syrian refugees in Lebanon to improve patient management and reduce morbidity and mortality of respiratory infections
- Training on the *Streptococcus pneumoniae* strain typing test organized at the Rodolphe Mérieux Laboratory of Beirut (three scientists involved in the PEARL study)

SUPPORT FOR LOCAL INITIATIVES

- Funding agreement with the Department of International Cooperation of the Principality of Monaco for the construction of a socio-medical center in Baalbek in the Bekaa plain, in partnership with the Lebanese NGO, Amel Association

GOVERNANCE

BOARD OF DIRECTORS

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President
Claudine FRIEH
Karine MEHLER
Alexandre MÉRIEUX
Sophie MÉRIEUX

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Prof. François GROS
Prof. David L. HEYMANN
Dominique PELLA**
Prof. Dominique PEYRAMOND
Prof. Didier RAOULT
Dr. Robert SEBBAG

GOVERNMENT REPRESENTATIVE

The Prefect of
the Auvergne-Rhône-Alpes
Region

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Scientific Director
Dr. Christophe LONGUET**
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Koren WOLMAN-TARDY
Communication Director

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Faculté de Médecine de Marseille (France)
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Centres GHESKIO (Haiti)
Prof. Fabien ZOULIM
Inserm - Lyon (France)

MÉRIEUX FOUNDATION USA

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Karine MEHLER
Mérieux Foundation Board of Directors (France)

TEAM

Dr. Louise GRESHAM***
CEO
Emily PENROSE
Program Manager

* Since December 2016

** Until December 2016

*** Until June 2016

PARTNERS

The Mérieux Foundation is grateful to its many partners for their continuing trust and commitment.

In 2016, thanks to their contribution, numerous capacity-building and research projects were initiated and enhanced to help local stakeholders in their fight against infectious diseases.

INTERNATIONAL & GOVERNMENTAL INSTITUTIONS

- Agence Française de Développement (AFD)
- African Society for Laboratory Medicine (ASLM)
- American Society for Microbiology
- Armed Forces Health Surveillance Center (AFHSC/GEIS)
- Alliance pour les sciences de la vie et de la santé (AVIESAN)
- Centers for Disease Control and Prevention (CDC)
- Conference of Francophone Pharmacists Associations (CIOPF)
- Coopération belge au Développement
- Defense Biological Product Assurance Office (DBPAO)
- Defense Threat Reduction Agency (DTRA)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- European Centre for Disease Prevention and Control (ECDC)
- European Commission
- European Diagnostic Manufacturers Association (EDMA)
- European Society of Clinical Microbiology and Infectious Diseases (ESCMID)
- Expertise France
- Expertise France/Initiative 5%
- Gouvernement Princier de Monaco
- Grand Lyon
- Hospices Civils de Lyon
- Islamic Development Bank (IDB)
- Ministère de l'Enseignement supérieur, de la Recherche et de l'Innovation

- Ministère des Affaires étrangères et du Développement international
- Région Auvergne-Rhône-Alpes
- The Global Fund to Fight AIDS, Tuberculosis and Malaria
- U.S. Agency for International Development (USAID)
- U.S. Department of State
- Ville de Lyon
- World Bank – through the West African Health Organisation (WAHO)
- World Health Organization (WHO)

FOUNDATIONS & NGOS

- Agence de Médecine Préventive (AMP)
- Amel Association
- Bill & Melinda Gates Foundation
- Catholic Relief Services
- CDC Foundation
- Centre Jacques Cartier
- Fogarty International Center
- Fondation AnBer
- Fondation Bullukian
- Fondation Christophe et Rodolphe Mérieux
- Fondation de France
- Fondation La main à la pâte
- Fondation PDC
- Fondation Pierre Fabre
- Fondation Raoul Follereau
- Fondation Saint-Irénée
- Fondation Stavros Niarchos
- Fondation Veolia
- Fonds Decitre
- Fonds pour Eux
- Gilead Foundation
- Institut Pasteur
- International Medical Corps
- Œuvres Pontificales Missionnaires

- PATH
- Red Cross
- Samusocial International
- Skoll Foundation
- The Pew Charitable Trusts
- Tulipe
- Wellcome Trust

UNIVERSITIES & RESEARCH INSTITUTES

- Agence France Recherche Nord&Sud Sida-HIV Hépatites (ANRS)
- Bioaster
- Centre International de Recherche en Infectiologie (CIRI)
- Centre national de recherche scientifique (CNRS)
- Claude Bernard Lyon 1 University
- Erasmus Medical Centre
- Institut national de la santé et de la recherche médicale (Inserm)
- Institut de recherche biomédicale des armées (IRBA)
- Institut de Recherche pour le Développement (IRD)
- Instituts de recherche en santé du Canada (IRSC)
- Institut National du Cancer (INCa)
- International Development Research Centre (CRDI)
- Johns Hopkins Bloomberg School of Public Health
- LabEx IBEID (Integrative Biology of Emerging Infectious Diseases)
- London School of Hygiene & Tropical Medicine (LSHTM)
- National Health Research Center
- National Institutes of Health (NIH)
- Naval Health Research Center (NAMRU-2)
- Penn State University (PSU)
- Royal Tropical Institute (KIT)
- University of Geneva
- University of Oxford

INDUSTRY

- ADITEC
- Bayer
- Beckman Coulter
- Biocentric
- bioMérieux
- Caprion
- Cepheid
- Copan
- Fast-track Diagnostics
- Genostar
- GlaxoSmithKline Biologicals (GSK)
- I2A
- Image 7
- Ip pharmex
- Institut Mérieux
- Janssen Research & Development
- Johnson & Johnson
- Luminox
- MedImmune
- Merck
- Mérieux NutriSciences
- Novartis Vaccines
- Orrick
- Pfizer
- Qiagen
- Sanofi Pasteur
- Serum Institute of India
- Takeda
- Tetraphase
- Valneva*

* Since 2017

2016 ACCOUNTS & KEY FIGURES

BALANCE SHEET

| ASSETS
(K€) | NET
DEC. 31. 2016 | NET
DEC. 31. 2015 |
|--|----------------------|----------------------|
| FIXED ASSETS | | |
| Intangible fixed assets | 24 | 9 |
| Property, plant and equipment | 1,705 | 1,832 |
| Investments and other financial assets | 28,003 | 26,199 |
| TOTAL | 29,732 | 28,040 |
| CURRENT ASSETS | | |
| Inventories | 0 | 4 |
| Payments on account | 37 | 21 |
| Accounts receivable | 2,971 | 1,203 |
| Other receivables | 11,480 | 12,275 |
| Marketable securities | 54,140 | 58,126 |
| Cash and cash equivalents | 5,017 | 3,781 |
| Prepaid expenses | 1,854 | 1,835 |
| Unrealized exchange losses | 12 | 8 |
| TOTAL | 75,509 | 77,254 |
| TOTAL ASSETS | 105,241 | 105,294 |
| LIABILITIES AND FUND BALANCE
(K€) | DEC. 31. 2016 | DEC. 31. 2015 |
| FUND BALANCE | | |
| True endowment | 64,916 | 64,916 |
| Reserves | 884 | 884 |
| Retained earnings | 18,463 | 12,816 |
| Net income / loss for the period | (653) | 5 648 |
| TOTAL | 83,611 | 84,264 |
| QUASI ENDOWMENT | | |
| Allowances for contingencies | 109 | 105 |
| Funds reserved for future engagements | 2,666 | 2,783 |
| TOTAL | 2,774 | 2,888 |
| LIABILITIES | | |
| Loans | 68 | 5 |
| Accounts payable | 1,956 | 2,340 |
| Investment payable | 360 | 702 |
| Other payable | 3,155 | 2,888 |
| Deferred income | 13,037 | 11,940 |
| Unrealized exchange gains | 279 | 267 |
| TOTAL | 18,856 | 18,142 |
| TOTAL LIABILITIES AND FUND BALANCE | 105,241 | 105,294 |

INCOME STATEMENT

| (K€) | ACTUAL 2016 | ACTUAL 2015 |
|--|---------------|---------------|
| INCOME | | |
| Services revenue | 372 | 311 |
| Grants | 315 | 26 |
| Reverse on operating allowances | 13,994 | 14,121 |
| Expenses refund | 713 | 665 |
| Other operating income | 17 | 326 |
| TOTAL INCOME | 15,411 | 15,447 |
| EXPENSES | | |
| External purchases and expenses | 9,490 | 9,201 |
| Taxes and duties | 872 | 1,176 |
| Salaries and social contributions | 4,025 | 3,662 |
| Depreciations | 311 | 313 |
| Donations and subsidies received | 7,724 | 7,121 |
| Grants awarded | - | - |
| Net book value of sold assets | - | - |
| Other operating income | 5 | 8 |
| TOTAL EXPENSES | 22,426 | 21,481 |
| CURRENT INCOME | -7,016 | -6,034 |
| FINANCIAL INCOME | | |
| Dividends | 1,208 | 1,044 |
| Other financial income | 794 | 1,087 |
| Reverse on financial allowances | 627 | 205 |
| Net income from marketable securities | 4,213 | 12,009 |
| TOTAL FINANCIAL INCOME | 6,842 | 14,345 |
| FINANCIAL EXPENSES | | |
| Financial allowances | 64 | 943 |
| Other financial expenses | 550 | 857 |
| TOTAL FINANCIAL EXPENSES | 615 | 1,800 |
| FINANCIAL RESULT | 6,227 | 12,546 |
| EXCEPTIONAL INCOME | | |
| Exceptional income | 117 | - |
| Exceptional reverse on allowances | - | - |
| TOTAL EXCEPTIONAL INCOME | 117 | - |
| EXCEPTIONAL COSTS | | |
| Exceptional expenses | - | - |
| Exceptional allowances for contingencies | 98 | 112 |
| TOTAL EXCEPTIONAL COSTS | 98 | 112 |
| EXCEPTIONAL RESULT | 19 | -112 |
| Income tax | - | - |
| TOTAL INCOME | 22,369 | 29,793 |
| TOTAL EXPENSES | 23,139 | 23,393 |
| INTERMEDIATE BALANCE | -770 | 6,400 |
| Prior funds carried forward | 2,894 | 2,035 |
| Funds reserved for future engagements | 2,777 | 2,783 |
| NET INCOME / LOSS FOR THE PERIOD | -653 | 5 652 |

2016 ACCOUNTS & KEY FIGURES

USE OF FUNDS STATEMENT

| EXPENSES (USES) (€) | ACTUAL 2016 |
|--|-------------------|
| MISSIONS | 17,876,730 |
| Clinical biology laboratories | 1,840,189 |
| Collaborative research programs | 4,375,863 |
| Training and knowledge-sharing | 6,936,061 |
| Support for local initiatives | 2,222,844 |
| Support for
Mérieux Laboratories and Centers | 197,342 |
| International expertise (including Quality) | 1,243,831 |
| Development of innovative public health
initiatives | 1,060,599 |
| FUND-RAISING EXPENSES | 954,208 |
| OPERATING EXPENSES | 3,841,612 |

| | |
|--|-------------------|
| TOTAL EXPENSES FOR THE PERIOD | 22,672,550 |
| ALLOWANCES | 155,848 |
| DEPRECIATION | 310,791 |
| FUNDS RESERVED FOR FUTURE ENGAGEMENTS | 2,776,606 |
| ACCOUNTING RESULTS (PROFIT) | - |
| GRAND TOTAL | 25,915,795 |
| Evaluation of in-kind patronage | - |

| INCOME (FUNDS) (€) | ACTUAL 2016 |
|---|-------------------|
| DONATIONS AND LEGACIES | 314,855 |
| Donations | 114,855 |
| Legacies | 200,000 |
| OTHER PRIVATE FUNDS | 10,783,220 |
| Sponsorship / Patronage | 2,286,800 |
| Grants from
Fondation Christophe et Rodolphe Mérieux | 3,629,193 |
| Other grants | 4,867,227 |
| GRANTS AND OTHER PUBLIC FUNDING | 3,211,065 |
| OTHER INCOME | 7,335,372 |
| Services revenues | 371,627 |
| Refund of expenses | 732,679 |
| Other financial income | 5,017,238 |
| Dividends | 1,213,828 |

| | |
|-------------------------------------|-------------------|
| TOTAL INCOME FOR THE PERIOD | 21,644,512 |
| REVERSE ON ALLOWANCES | 724,397 |
| PRIOR FUNDS CARRIED FORWARD | 2,894,269 |
| ACCOUNTING RESULTS (DEFICIT) | 652,617 |
| GRAND TOTAL | 25,915,795 |
| Evaluation of in-kind patronage | - |

FONDATION MERIEUX
 Foundation recognized as being of public utility
 17 rue Bourgelat
 69002 LYON

**Statutory auditors' report
 on the financial statements**
 Year ended December 31, 2016

This is a free translation into English of the statutory auditors' report issued in French and is provided solely for the convenience of English speaking users. The statutory auditors' report includes information specifically required by French law in such reports, whether modified or not. This information is presented below the opinion on the financial statements and includes an explanatory paragraph discussing the auditors' assessment of certain significant accounting and auditing matters. These assessments were considered for the purpose of forming an audit opinion on the financial statements taken as a whole and not to provide separate assurance on individual account entries or on information taken outside of the financial statements. This report also includes information relating to the specific verification of information given in the management report and in the documents addressed to shareholders. This report should be read in conjunction with, and construed in accordance with, French law and professional auditing standards applicable in France.

To the Directors,

In accordance with the assignment entrusted to us by your board of directors, we hereby report to you for the year ended December 31, 2016 on:

- the audit of the accompanying financial statements of FONDATION MERIEUX;
- the justification of our assessments;
- the specific verification and information required by law.

These financial statements have been approved by the Committee. Our role is to express an opinion on these financial statements, based on our audit.

I. OPINION ON THE FINANCIAL STATEMENTS

We conducted our audit in accordance with professional standards applicable in France; those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit involves performing procedures, using sampling techniques or other methods of selection, to obtain audit evidence about the amounts and disclosures in the financial statements. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made, as well as the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

FONDATION MERIEUX

2/2

In our opinion, the financial statements give a true and fair view of the financial position and the assets and liabilities of the Foundation as of December 31, 2016 and the results of its operations for the year then ended in accordance with in accordance with French accounting principles.

II. JUSTIFICATION OF OUR ASSESSMENTS

In accordance with the requirements of article L.823-9 of the French Commercial Code (*code de commerce*) relating to the justification of our assessments, we inform you that the assessments made by us in the context of our audit of the financial statements focused particularly on:

The net amount in the balance sheet on 31 December 2016 of equity securities amounted to 14,997,467 euros. Those are valued at acquisition price and depreciated on the basis of their fair value as described in the note "Investments" of the notes to the financial statements. Based on the information made available to us, our work has consisted in assessing the data underlying these values in use and checking the consistency of assumptions.

The audit evidence we obtained and the assessments we made on these items contributed to the formation of the opinion expressed in the first part of this report.

III. SPECIFIC VERIFICATIONS AND DISCLOSURES

We have also performed, in accordance with professional standards applicable in France, the specific verifications required by French law.

We have no matters to report as to the fair presentation and the consistency with the financial statements of the information given in the financial report and in the documents addressed to Directors with respect to the financial position and the financial statements.

Lyon, June 15, 2017

The Statutory Auditor

DELOITTE & ASSOCIÉS

French original signed by Nathalie LORENZO CASQUET

2016 ACCOUNTS & KEY FIGURES



BREAKDOWN OF 2016 EXPENSES

(Excluding provisions and exceptional expenses)

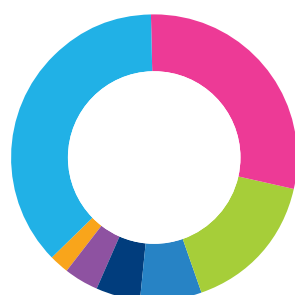
| | |
|----------------------|-----|
| Missions | 82% |
| Administration | 13% |
| Fundraising expenses | 5% |



BREAKDOWN OF 2016 EXPENSES BY ACTIVITY

(Excluding provisions and exceptional expenses)

| | |
|---|-----|
| Training and knowledge-sharing | 39% |
| Collaborative research programs | 24% |
| Support for local initiatives | 13% |
| Clinical biology laboratories | 10% |
| International expertise | 7% |
| Development of innovative public health initiatives | 6% |
| Support for Mérieux Laboratories and Centers | 1% |

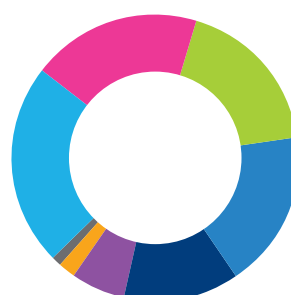


GEOGRAPHICAL SEGMENTATION OF ACTIVITIES

(Excluding funds carried forward to 2017)

| | |
|-----------------------|-----|
| Europe ⁽¹⁾ | 37% |
| Africa | 29% |
| Asia | 16% |
| The Caribbean | 7% |
| South America | 5% |
| Middle East | 4% |
| Indian Ocean | 2% |

(1) Mostly activities in developing countries managed from France



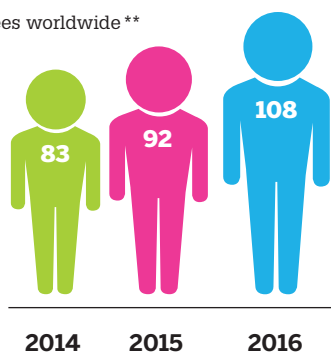
BREAKDOWN OF 2016 INCOME

(Excluding dedicated funds, provisions and non-recurring items)

| | |
|--|-----|
| Endowment income & investment | 23% |
| Private partnerships | 19% |
| Fondation Christophe et Rodolphe Mérieux | 18% |
| Public partnerships | 18% |
| Sanofi Pasteur sponsorship and partnership | 13% |
| Real estate income | 6% |
| Other income | 2% |
| Donations & legacies | 1% |

GEOGRAPHICAL SEGMENTATION OF EMPLOYEES* AS AT DECEMBER 31ST

108 employees worldwide **

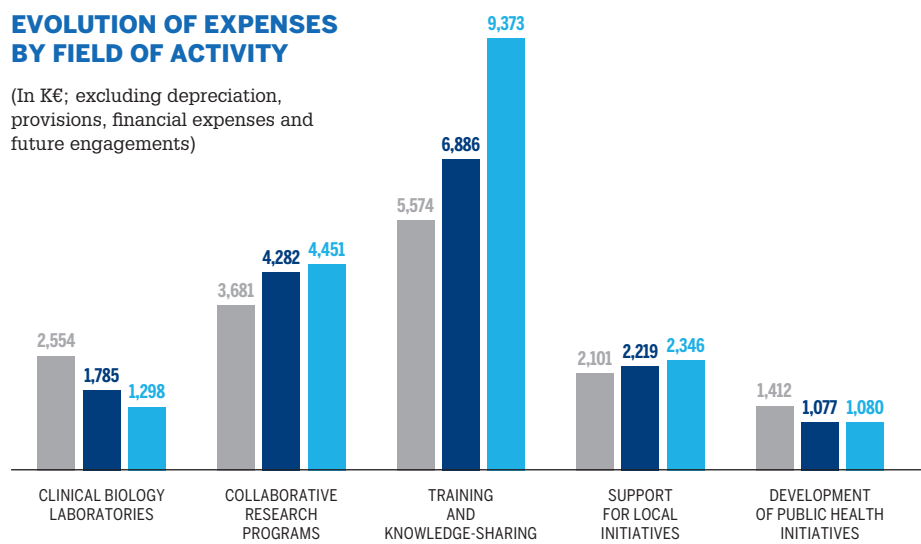


* Full-time equivalents

** Excluding interns, temporary employees and local research and training center staff

EVOLUTION OF EXPENSES BY FIELD OF ACTIVITY

(In K€; excluding depreciation, provisions, financial expenses and future engagements)



■ 2015 ■ 2016 ■ 2017 Estimate

KEY FIGURES

19 countries where we work

29 biology training centers built or renovated

A network of **18** applied research units

Over **25** collaborative research programs

13 laboratories built

31 hospital laboratories renovated, including 2 in 2016

12 conferences

11 training courses and programs

108 employees in 13 countries

A **22** million euro budget

PHOTOS

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Antonin Bouvier

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Mérieux Foundation

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www.fondation-merieux.org

Sophie Poisard-Storz

www.solutions-editoriales.com

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www.theraconseil.com

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2016 ANNUAL REPORT



ROOTS FOR LIFE

