



## Mérieux Foundation GABRIEL Laboratory Network

The international scientific network GABRIEL was created by Fondation Mérieux in 2008 to strengthen the research and training capacities of local laboratories and improve the surveillance of diseases with a major impact on public health in developing countries. The GABRIEL\* network promotes collaboration in the field of infectious diseases and supports local responses to health challenges through:

- **Collaborative research** on acute respiratory infections, tuberculosis, antimicrobial resistance, and emerging pathogens surveillance,
- **Technology transfer** of diagnostic testing tools to enable local laboratories to detect diseases and monitor epidemics,
- **Training and knowledge sharing** to empower local scientists so they can conduct autonomous research projects.

This non-profit network brings together **20 research laboratories** in academic, public and private institutions and aims to improve laboratory- and hospital-based surveillance (virology, bacteriology, molecular epidemiology and immunology) and research capacity on infectious diseases that have a major impact on public health. Members meet every 18 months to share and compare results and experiences, and present new ideas for collaborative research projects. At the core of the GABRIEL network are the nine **Rodolphe Mérieux Laboratories**, which meet the most exacting international standards. They were built by the Mérieux Foundation and transferred to local partners to improve capacity in regions of the developing world at high risk of infectious disease outbreaks.

A Steering Committee, chaired by Professor Jean-William Pape, Director of the GHESKIO Centers in Haiti, oversees the implementation of GABRIEL activities.

The Mérieux Foundation coordinates the network's activities and assists member laboratories through:

- Highly trained staff and compliance with international standards (BSL2 and BSL3),
- Development and transfer of diagnostic research tools to identify viruses, bacteria, and biomarkers, as part of a syndromic approach, using multiplex technologies and "omics",
- Strong relationships with clinicians and local public health authorities,
- Expertise in the field of viral and bacterial respiratory infections,
- Presence in areas exposed to a high risk of emerging disease outbreaks.

The GABRIEL network also supports member laboratories to meet the international accreditation requirements for the ISO 15189 standard. This is part of a quality initiative launched by the Mérieux Foundation in 2014.

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\* GABRIEL: *Global Approach to Biology Research, Infectious diseases and Epidemics in Low-income countries*

## KEY FIGURES

- **20** member laboratories in **16** countries
- **>70 scientists** dedicated to GABRIEL research programs
- **>190 scientists** trained in new diagnostic tools
- Nearly **700 scientists** trained in molecular biology, immunology, bioinformatics, epidemiology, biosafety, quality assurance, etc.
- **51** organized **workshops**
- **57 technical trainings** by mentoring
- **10 e-learning modules** on epidemiology, clinical research, molecular biology, Zika diagnosis, biobanks
- **>950 publications** since 2012
- **30** editions of the newsletter GABRIEL
- **11** international meetings of members

## BANGLADESH

### 1) Bangladesh Institute of Tropical & Infectious Diseases (BITID), Rodolphe Mérieux Laboratory - Chittagong

- Public institution under the Ministry of Health
- Focus: enteric diseases, tuberculosis, pneumonia, AMR, COVID-19
- Infrastructure and technology: BSL2, BSL3, molecular biology, microbiology
- Built according to ISO 14644 (part 4 and 1); accredited ISO 15189
- Direct clinical access to patients



### 2) International Centre for Diarrheal Disease Research Bangladesh - icddr,b (Mycobacteriology Laboratory) - Dhaka Private institution with public funding

- Focus: tuberculosis diagnosis, surveillance, drug resistance, immunology, epidemiology, genotyping, transmission, control and prevention.
- Infrastructure and technology: BSL2+, immunology, molecular biology and typing
- Indirect clinical access to patients

### 3) Institute for Developing Science and Health Initiatives - ideSHi (Laboratory of Infectious Diseases and Laboratory of Genetics and Genomics) - Dhaka

- Non-government organization
- Focus: COVID-19 testing, antibiotic susceptibility testing, bacteria identification, dengue, diarrhea infectious diseases, hepatitis B and C, and other neglected diseases, respiratory infectious diseases (influenza, pneumonia...), tuberculosis, other routine diagnosis tests of non-communicable diseases
- Infrastructure and technology: molecular biology, sequencing, LAMP, ELISA and dot blot
- Indirect clinical access to patients

## BRAZIL

### 4) Oswaldo Cruz Institute, Oswaldo Cruz Foundation - FIOCRUZ (Laboratory of Respiratory Viruses) – Rio de Janeiro

- National Reference Laboratory
- Focus: respiratory infectious diseases (Flu, RSV, SARS-CoV-2) and measles.
- Infrastructure and technology: cellular and molecular biology, cell and viral culture, bioinformatics, genomics, serology
- Indirect clinical access to patients

### 5) Laboratório Nacional de Computação Científica (LNCC), Laboratório de bioinformática (LABINFO) - Petropolis

- Public academic / research institution
- Focus: bioinformatics
- Infrastructure and technology: genomics and bioinformatics platforms
- Indirect clinical access to patients

### 6) Tropical Medicine Institute of University of São Paulo

- Public academic institution
- Focus: COVID-19, arboviruses, viral hepatitis, HIV, HPV, microbiome and virome in disease and health; immunology of bacterial, fungal and viral infections; tuberculosis, AMR
- Infrastructure and technology: Molecular biology, Sequencing and metagenomics, Cell and viral culture; Conventional serology
- Direct clinical access to patients

### Rodolphe Mérieux Laboratory, Fundhacre Hospital - Rio Branco

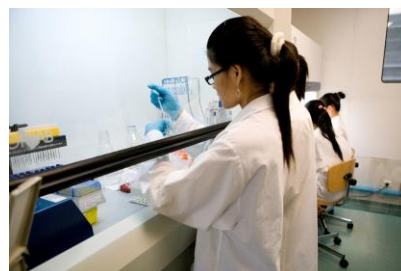
- Public institution
- Focus: COVID-19, hepatitis B and Delta
- Infrastructure and technology: BSL3, BSL2, molecular biology,
- Direct clinical access to patients
- GABRIEL membership under preparation



## CAMBODIA

### 7) University of Health Sciences, Rodolphe Mérieux Laboratory - Phnom Penh

- Autonomous public academic institution
- Focus: Hepatitis C, respiratory infectious diseases (Flu, Pneumonia...), SARS-CoV2, biobank., pharmacokinetic of HIV drugs
- Infrastructure and technology: BLS3, molecular biology, microbiology, typing, biobanking, HPLC for drug concentration analysis Built according to ISO14644 (part 4 and 1)
- Indirect clinical access to patients



## CAMEROON

### 8) Centre Pasteur du Cameroun - Yaoundé

- National Laboratory, public institution under the Ministry of Health
- Focus: COVID-19, hepatitis B and C, HIV, respiratory infectious diseases (influenza, pneumonia...), tuberculosis, arbovirus, zoonotic infectious diseases, Buruli ulcer, AMR
- Infrastructure and technology: BSL2, BSL3, molecular biology, immunology, typing, DST
- Indirect clinical access to patients

## CHINA

### 9) Institute of Pathogen Biology, Chinese Academy of Medical Sciences & Peking Union Medical College (IPB, CAMS, PUMC), Christophe Mérieux Laboratory - Beijing

- National Laboratory, Ministry of Health
- Focus: etiology and epidemiology of respiratory tract infection; Molecular evolution of important respiratory viruses; Pathogenesis and biomarker identification of viral respiratory infection
- Technological centers/platforms: molecular screening on respiratory pathogens; Respiratory virus isolation techniques; Phylodynamic analysis on viruses; Deep sequencing platforms; Single cell sequencing and analysis; Metagenomic analysis; Protein expression and purification
- Indirect clinical access to patients



## DEMOCRATIC REPUBLIC OF CONGO

### 10) Rodolphe Mérieux Laboratory INRB-Goma

- National institution
- Focus: Ebola, COVID-19, cholera
- Infrastructure and technology: BSL3, BSL2; sequencing; bacteriology; virology; immuno-serology; clinical biology (hematology, chemistry & parasitology)



## GEORGIA

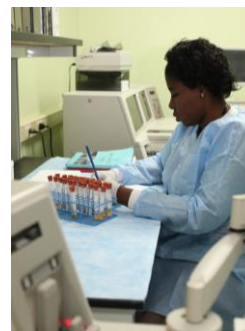
### 11) National Center for Tuberculosis and Lung Disease (Mycobacteriology Laboratory) -Tbilisi

- National Laboratory, non-profit organization - national tuberculosis program
- Focus: antibiotic susceptibility testing, bacteria identification and tuberculosis
- Infrastructure and technology: molecular biology PCR, hybridization, typing (Spoligo, MIRU-VNTR), Drug susceptibility testing in MGIT Bactec 960
- Direct clinical access to patients

## HAITI

### 12) GHESKIO, Rodolphe Mérieux Laboratory – Port-au-Prince

- Non-profit organization
- Focus: COVID-19, HIV, sexually transmitted infections, tuberculosis, respiratory infectious diseases (influenza, pneumonia), diarrhea/cholera, Zika, gender-based research
- Infrastructure and technology: BSL2, BSL3, molecular biology, microbiology, immunology, typing
- Built according to ISO 14644 (part 4 and 1), ISO 15189 accreditation
- Direct clinical access to patients



## INDIA

### 13) King George's Medical University (Translational Medicine Unit) - Lucknow

- Autonomous state government university
- Focus: pneumonia; public health issues in child survival
- Infrastructure and technology: hospital laboratory BSL2, molecular biology, antibiotic susceptibility testing, bacteria identification
- Direct clinical access to patients

## LAOS

### 14) Center of Infectiology Lao Christophe Mérieux – Vientiane

- Public institution under the Ministry of Health
- Focus: tuberculosis, hepatitis B and C, HIV, respiratory infectious diseases (influenza, pneumonia), COVID 19
- Infrastructure and technology: BSL2+, BSL3 (underway), molecular biology, immunology, typing, Luminex platform
- Aiming at ISO 15189 accreditation
- Indirect clinical access to patients





## LEBANON

### 15) Université Libanaise - Laboratoire Microbiologie, Santé et Environnement – Tripoli

- Public University; Reference laboratory for conventional and molecular techniques in the diagnosis of TB and drug susceptibility in North Lebanon,
- Focus: tuberculosis, pneumonia, antimicrobial resistance, microbiota, immunity and infections
- Infrastructure and technology: BSL2, BSL3, molecular biology, immunology, typing, bioinformatics
- Indirect clinical access to patients

### 16) Université Saint Joseph, Rodolphe Mérieux Laboratory - Beirut

- University laboratory, approved by the Ministry of Health
- Focus: COVID-19, tuberculosis; hepatitis B and C, HIV
- Infrastructure and technology: BSL2, BSL2+, BSL3, ISO8 cleanroom, molecular biology, typing
- Aiming at ISO 15189 accreditation
- Indirect clinical access to patients



## MADAGASCAR

### 17) Charles Mérieux Center for Infectious Diseases, Rodolphe Mérieux Laboratory - Antananarivo

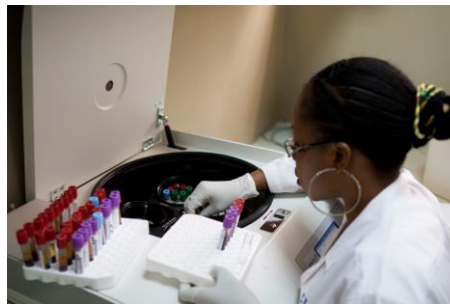
- University of Antananarivo, national reference laboratory for leprosy
- Focus: antimicrobial resistance, Schistosomiasis, Tuberculosis, HIV, Covid-19, Meningitis, Leprosy, Chromoblastomycosis, Sporotrichosis
- Infrastructure and technology: BSL2+, molecular biology, immunology, DST
- Built according to ISO 14644 (part 4 and 1)
- Indirect clinical access to patients



## MALI

### 18) Charles Mérieux Center for Infectious Diseases, Rodolphe Mérieux Laboratory - Bamako

- Public institution under the Ministry of Health
- Focus: COVID-19, respiratory infectious diseases (pneumonia), hemorrhagic fevers, tuberculosis, antimicrobial resistance, hepatitis
- Infrastructure and technology: BSL2, BSL3 (container lab), molecular biology, immunology, microbiology
- Built according to ISO 14644 (part 4 and 1)
- Indirect clinical access to patients



## PARAGUAY

### 19) Instituto de Investigaciones en Ciencias de la Salud, National University of Asunción, Departamento de Biología Molecular y Biotecnología - Asuncion

- Public institution
- Focus: antimicrobial resistance, respiratory infectious diseases (influenza, pneumonia), tuberculosis, atypical mycobacteria, meningoencephalitis, leishmaniosis, Chagas disease, gastroenteritis viral infections
- Infrastructure and technology: BSL2, molecular biology, microbiology, immunology, typing, Sequencing analysis and bioinformatics, host-pathogen interaction assays.
- Indirect clinical access to patients

## UKRAINE

### 20) Zaporozhye State Medical University (Laboratory of Molecular Genetic Studies) - Zaporozhye

- Academic institution
- Focus: tuberculosis, enterovirus infections
- Infrastructure and technology: BSL2, BSL3, molecular biology, immunology
- Indirect clinical access to patients

