

# A NETWORK IN ACTION

**GABRIEL** member laboratories work jointly on research programs to improve the control, prevention, and treatment of infectious diseases that have a significant impact on public health.

The **GABRIEL** network builds synergies among its members who share their research approach and results. Members also benefit from a variety of resources, including training programs, quality assurance procedures, biobanking, sequence databases, and bioinformatics.

**DEVELOPING NEW DIAGNOSTIC TESTS** for identification, characterization and surveillance of circulating pathogens, such as emerging, mutant or resistant strains.

**TRANSFERRING TECHNOLOGY** to enable local laboratories to conduct disease detection and surveillance on site.

**STRENGTHENING CAPABILITIES** of local scientists to conduct research projects autonomously through **training** and **knowledge-sharing**.

**CONDUCTING EPIDEMIOLOGICAL STUDIES** through partnerships with local clinicians and health authorities.



## COLLABORATIVE RESEARCH

One of GABRIEL's main strengths lies in its capacity to bring together local and global perspectives in the design of its research programs. Participating laboratories determine the priorities that are relevant to their regions.

The Emerging Pathogens Laboratory (LPE) provides scientific expertise and coordinates the network's research programs. Located in Lyon next to the P4 Jean Mérieux Laboratory, the LPE benefits from preferential access to this BSL4 maximum-security unit dedicated to emerging pathogens.

### INNOVATIVE TECHNOLOGY TRANSFER

The laboratory tests, which are at the heart of GABRIEL research programs, are designed to identify viruses, bacteria and biomarkers, in a syndrome-based approach, using multiplex technologies. The LPE develops these tools and transfers them to the GABRIEL laboratories through training programs.



## AFRICARAMI

AFRICARAMI, an African and Caribbean partnership to fight against infectious diseases, is an example of scientific and technical collaboration within the GABRIEL network. It was created to foster independent and sustainable research programs and strengthen research capabilities in four countries: Cameroon, Mali, Madagascar and Haiti.

The project was funded by the ACP Science and Technology Programme and the European Commission.

### PROGRESS ACHIEVED:

- **63 institutions** participated,
- **8 research protocols** on tuberculosis and pneumonia implemented,
- **5 publications** and **23 presentations** at international meetings,
- **More than 500 scientists** trained through 7 course modules.

## MAJOR PROGRAMS

### GABRIEL-DEVELOPED TESTS

- **Molecular test for respiratory pathogens** (19 viruses & 5 bacteria)
- **S. pneumoniae strain typing** (40 types)
- **Molecular test for bacteria in blood samples**
- **Molecular test for meningitis**
- **Tuberculosis strain genotyping** (sub-species epidemiology)

### SEVERE PNEUMONIA IN CHILDREN UNDER 5

GABRIEL's multi-center pneumonia study seeks to determine which respiratory pathogens cause severe pneumonia and identify the serotypes of *pneumococcus* prevalent in 10 participating countries. Focusing on hospitalized children under the age of 5, study results should help to identify the etiological agents to assess the effectiveness of vaccination and patient care.

### MULTIDRUG-RESISTANT TUBERCULOSIS

The GABRIEL research program on tuberculosis aims to assess both the epidemiology of this disease in low income country settings and the burden of resistance to antibiotics.

To evaluate the prevalence of multidrug-resistant tuberculosis (MDR-TB), a line probe assay is implemented at some GABRIEL laboratories. This molecular test is well-adapted to settings with limited biosafety infrastructures. Next Generation

### RESEARCH GOALS

- Better understand the bacterial and viral etiology of pneumonia in countries with no available data
- Determine the impact of coinfection on severity
- Identify *Streptococcus pneumoniae* serotypes
- Study the correlation between the type of pathogen and biomarkers
- Identify & characterize new infectious agents

### RESEARCH GOALS

- Evaluate MDR-TB prevalence
- Improve treatment monitoring of TB patients
- Identify new molecular markers of resistance to antibiotics

Sequencing on the whole bacterial genome is also being developed to enhance molecular diagnostic capacities. Both approaches are indicated for MDR-TB epidemiological surveillance, as well as for TB patient treatment monitoring.



Launched in 2008 by Fondation Mérieux, **GABRIEL** is an international scientific network created to **reinforce the capabilities of research laboratories in developing countries** and foster collaboration in the field of infectious diseases. GABRIEL brings together researchers in developing, emerging and developed countries.



- Highly trained staff and international standard laboratories (BSL2 and BSL3)
- Strong ties with clinicians and local public health authorities
- Expertise in viral and bacterial respiratory infections
- Presence in zones with a high risk of epidemics from emerging diseases
- Over 15 member laboratories and 65 scientists dedicated to GABRIEL research programs

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Established in 1967, Fondation Mérieux is an independent family foundation with official public interest status. Its mission is to contribute to global health by strengthening the local capacities of developing countries to reduce the impact of infectious diseases on vulnerable populations. One of its activities is building and coordinating laboratory networks to improve access to reliable diagnostics for better patient care.

Fondation Mérieux is active on five continents with a permanent presence in Burkina Faso, Cambodia, China, France, Haiti, Laos, Lebanon, Madagascar, Mali, and the United States.

● [www.fondation-merieux.org](http://www.fondation-merieux.org)

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Global Approach to Biological Research, Infectious diseases and Epidemics in Low-income countries

# FOSTERING RESEARCH COLLABORATION IN THE FIELD OF INFECTIOUS DISEASES



## 3 ESSENTIAL OBJECTIVES

Enhancing research capabilities

Leading multi-center studies

Harmonizing applied research methodologies

