



ISM

Higher Institute for
Scientific and Medical
Research

Description of the ISM laboratory Operations

ISM Laboratory Functioning

Lab Coordinator: Hugues Nana Djeunga

The ISM laboratory is organized into three main platforms: Basic Parasitology, Immunobiology and Molecular Biology.

In addition to these main platforms, a cold chain, a stock for supplies management and waste management systems (with dedicated persons in charge) have been set up for optimal functioning of ISM laboratory.

All the staff of these different platforms are trained (with certificates) for Good Laboratory and Good Clinical Laboratory Practices (GCLP). Trainings on biosafety are ongoing.

1. Basic Parasitology Platform

Basic Parasitology Platform Supervisor: Jean Bopda

The basic parasitology platform is a research laboratory at ISM, specialized in medical parasitology, especially for tropical diseases. The activities are based on laboratory diagnosis in support of ISM clinical and research activities, as well as training of students from various universities and training schools.

We are using different diagnostic approaches for the diagnostic of parasites, including direct parasitological diagnosis based on microscopy, in different types of samples. We are using Kato Katz and Mini FLOTAC techniques to search for parasites in stool samples, filtration technique to search for schistosomiasis and microfilariae in urine samples, as well as skin snip to search





for microfilariae under the skin for the diagnostic of onchocerciasis.

Many techniques are used in the Basic Parasitology platform of the ISM Laboratory to search for parasites in blood samples, including thin and thick blood smears for different stages of malaria parasites, calibrated thick blood smear for the qualitative and quantitative diagnosis of microfilariae, blood filtration for isolation of blood-dwelling microfilaria, as well as dry blood spots for further immunological and molecular analyzes.

2. Immunobiology Platform

Immunobiology Platform Supervisor: Linda Djune Y.

The Immunobiology Platform of the ISM Lab is a newly created platform still under development, with the ultimate goal work on the identification/development of immunological markers of infectious diseases.

The platform composed of 06 qualified and well-trained staffs and a supervisor responsible of the overall functioning of the platform. The platform is involved in clinical immunodiagnostic activities as well as research activities. In addition, the platform is certified as reference laboratories in NTDs diagnostic, supporting many control programs in Africa.





The platform is equipped of bench centrifuges, a 96-wells-plate reader, a plate washer, numerous multichannel pipettes and ordinary pipettes, working spaces (bench and sink), spaces for reagent storage (under the beach) and a refrigerator.

In addition, it is equipped of a temperature control system, an archiving system and a security system. The main activities currently done in this platform are lateral flow immuno-assay (LFIA, for lymphatic filariasis, onchocerciasis, malaria, COVID-19, ...), PBMCs (using ficoll tubes), plasma/serum, buffer coat separation and conservation.





We are also performing ELISA for numerous diseases (both using commercially available kits and in-house methods). For the coming months staff will be trained on immunophenotyping, and basic proteomic analyses.



3.Molecular Biology Platform

Molecular Biology Platform Supervisor: Arnauld Efon E.

The molecular biology platform activities are based on molecular diagnostic, molecular entomology, as well as population genetics and bioinformatics.

The activities of this platform primarily focus on research of molecular markers for the acute detection of various pathogens, including parasites and viruses. It aims at the diagnosis of infectious diseases and involves all known diagnostic steps including the extraction and purification of nucleic materials (DNA, RNA) using a range of methods and both traditional and real-time PCR. Molecular entomologies activities are also among





the main activities of the platform, consisting in molecular characterization of various arthropods of medical importance (blackflies, mosquitoes, tsetse flies ...) and parasites including the assessment of genetic diversity and pathogen genotyping.

Bioinformatics and computational biology are developed as supportive activities of core molecular biology platform activities, and it includes both basic bioinformatics (primers design and evaluation), analysis of sequencing data (genomics and transcriptomics) and predictive biology.



The molecular Biology Platform is equipped with high tech machines for the, including:

- a Real time PCR (Polymerase Chain Reaction) instrument a Thermocycler Biorad
- a Nucleic material extraction instrument
- a Precellys instrument
- a PSM
- a Laminar flow hoods
- Centrifuges
- Trans illuminator equipped with a photo system
- a Fridge for reagent storage



4. Management systems for optimal functioning

i. Cold chain

Person in charge of the cold chain: Stève Mbickmen Tchana

When we receive a sample for storage in cold place, first of all, we have to place it into the appropriate storage device; the sample is then stored in the appropriate temperature and the register of the device is filling in.

Between 2 and 3 PM every day, the temperature inside each device is recording on the Temperature Form located on the door of each device. At the end of each month, the Unit Supervisor update the database based on the different registers.



ii. Stock Management

Person in charge of the cold chain: André Domche

The stock of supplies is managed through a database containing relative information about them. This database contains information on the name of supplies, the available quantity, the expiry date, the acquisition project and the exact storage location (shelf number).

In the physical space dedicated to this purpose, the articles are mainly classified according to their nature/type and safety rules. Supplies withdrawals are made on request to the stock managers using a form designed for this purpose, and the same applies to entries.

Access to the stock storage area is therefore limited to two managers (who supplies the different units within the laboratory when needed but also teams with field activities). When materials are taken out, priority is given to those with the earliest expiry date. This meticulous stock management makes it possible to always have the right amount at the right time, to avoid wastage and supplies expiry. Cleaning of the storage space, inventories and database updates are carried out every two months or before when there are entries or exits of supplies.

iii. Waste management procedure

Person in charge of the cold chain: Jean Bopda

The activities carried out in the different platforms of the ISM laboratory generate a lot of waste presenting an infectious risk. Waste generated is sorted directly during production in different collection bins. Non-pungent infectious waste is collected in a bin containing a black garbage bag.

The pungent infectious waste is collected in a red Safety Box. The different bins are collected on a weekly basis (or when full there are many activities ongoing) and are stored in a suitable and dedicated storage room for destruction at a monthly or two-monthly basis in a district hospital of the Centre Region.





Prof. Joseph KAMGNO

Head of Department of Public
Health

Faculty of Medicine and Biomedical
Sciences

University of Yaounde I

CEO of Higher Institute for Scientific
and Medical Research
(ISM)









ISM Team



ISM

Higher Institute for
Scientific and Medical
Research