TRIPARTITE MANAGEMENT

Unit Director (DU) : André Garcia
Assistant Unit Director (DUA) : Florence Migot-Nabias
Chief Administrator (RA) : Brigitte Techer

SINGLE TEAM

3 research axes multidisciplinary and complementary

- Host-Pathogen Interactions (**HOPE**)
- Pharmaceuticals : from molecule to marketplace (**MEDS**)
- Host genetic adaptation (**GENE**)

1 group for backup and support of research activities

- Management, information and communication (**GECO**)

SET-UP IN THE SOUTH

2 Sites (Calavi - Benin, Accra - Ghana)
1 Sub-site (Dakar - Senegal)
1 Clinical Research Centre (IRCB - Benin)
1 International Mixed Laboratory (LMI CONS-HELM)
1 Communal Mixed Laboratory (LMC CERPAGE)
2 IRD-Associated Young Teams (JEAI)

- Respiratory Illnesses and air pollution exposure in school children (**RIPE**)
- Severe malaria: clinical profiles, aetiology of anaemias and of paediatric sepsis (**TILAPIA**)

The Unit is engaged in efforts related to quality. Parts of its research and administrative processes are certified ISO 9001 : 2015

- **Parasite culture in a BSL2 laboratory**
- **Hosting and supervision**
- **Support services: laboratory management, administrative services (Human Resources, Purchasing, Suppliers), regulatory aspects, logistics (chemicals, reagents, computer equipment), regulations (regulatory watch, support for research projects)**

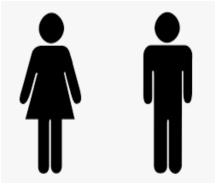
IRD Institut de Recherche pour le Développement FRANCE

MERIT UMR 261
Mère et enfant en milieu tropical

Université Paris Cité

KEY POINTS FROM 2022

1,3 M€ Annual budget



71 personnes

- **19 Research Staff** (14 IRD – 5 UPC)
- **10 Technical Staff** (8 IRD - 2 UPC)
- **5 seconded staff**
- **3 PLP** (permanent local personnel)
- **5 staff on contract**
- **15 PhD students**
- **14 trainees**

- **4 EDCTP projects**
- **4 international projects**
- **2 foundation projects**
- **6 ANR projects**
- **1 expertise France project**
- **1 IDEX project**
- **1 FHU Project**

Scientific Journal

60 peer-reviewed publications during the year

OUR FIELD ACTIVITIES

Mission : to improve the care and prevention of maternal and childhood diseases in the context of national public health policies and strategies

Research topics

1 VACCINE FOR MALARIA

Clinical development of candidate vaccines for placental malaria (VAC4PM)

Placental malaria is a severe disease that affects a particularly vulnerable group of individuals, namely pregnant women. The burden of disease they carry is high, affecting more than 100 million women every year and causing the deaths of around 50 000 pregnant women and up to 200 000 newborns. An effective vaccine would represent an attractive tool for the control of placental malaria and its consequences, complementing existing approaches that are still imperfect. The results of the first clinical trials with the VAR2CSA antigen underlined the need to enhance the capacity of the candidates evaluated to induce greater cross-reactivity of responses. The overall objective of our Unit's vaccine-related projects is to advance the development of the placental malaria vaccine and to broaden the immune response by i) enhancing the levels of antibodies induced by the vaccine through the use of virus-like particles (VLP) for the display of VAR2CSA antigens, or ii) evaluating the potential of an approach using conformationally correct synthetic peptide derivatives associated with VLP to strengthen cross-reactive and inhibitory antibody titres.

Funding : GHIT Fund, Horizon Europe (UE)
Partners : EVI, University of Copenhagen, Inserm, NIAID, Ehime University (Japan), Radboud University Nijmegen Medical Centre (Netherlands), ADAPTVAC

2 NON-COMMUNICABLE DISEASES

Air quality and quality of life of asthmatic infants in Africa (AIRQALY-4-ASMAFRI or A4A)

Air pollution is responsible for 9 million deaths per year, equating to a loss of 3 years of life expectancy. More than 10% of these deaths are of children under 15 years old. Asthma, with a prevalence of 14% in 13-14 year-olds, is one of the principal causes. The objective of A4A is to follow a cohort of 750 asthmatic Beninese schoolchildren in order to evaluate the impact of air pollutants on control of asthma, the effectiveness of treatment and the effects on quality of life. The effect of a personalised education approach on air quality, on the control of asthma, and on quality of life will also be evaluated.
Funding : ANR
Partners : CNHUPPC, UAC, ULCO/UCEIV, UMR UMMISCO, CRC

Respiratory illnesses and air pollution exposure in school children (JEAI RIPE)

Children are particularly vulnerable to the effects of air pollution because their lungs and immune systems are still developing. Most epidemiological studies investigating the association of air pollution exposure (APE) with respiratory health outcomes have been conducted in developed countries where exposure concentrations are generally very low or in school children who do not face the many competing risks encountered in low- and middle-income countries. The JEAI RIPE proposes to explore the relationship between EPA and respiratory disease in Ghana with the establishment of a cohort of 300 school children who will be followed for three years at two sites, one urban (Accra) and one rural (Aburi). The final objective is to define specific alert thresholds (exposure) for this vulnerable group to help develop EPA mitigation strategies.

Funding : IRD JEAI
Partners : Univ. of Cape Coast and Univ. of Kumasi in Ghana

3 FUNDAMENTAL RESEARCH

New fluorogenic, photosensitive tags for applications in interactomics and bioimaging (OXO-Tags)

Fluorescent tags are important tools in biological and biomedical research. We are developing a unique structural modification applicable to the most commonly used organic fluorophores, in order to generate analogues with novel photosensitive, covalent linking and fluoro-genetic properties (PCCF). Following conjugation to small molecules or macromolecules of interest (drugs, naturally-derived proteins, RNA) these tags will allow us to identify the targets and biological partners of those molecules. This approach relies on interactomic and imaging techniques, with a focus on super-resolution microscopy for these PCCF tags. The objectives of this project are firstly to synthesize a panel of PCCF tags, followed by functional screening using simple biological models. A selection of the best tags will then be tested under standardised conditions using known ligand-partner pairs, and subsequently used to explore the interactomes of novel relevant ligands.

Funding : ANR
Partner : UMR 8038 CNRS CiTCoM