



## :: Editorial

The public health missions assigned by the health authorities to the Institut Pasteur in French Guiana through the National Reference Centres have, in terms of research, a double advantage: being able to anchor the work carried out in the reality of the infectious disease health issues of the French West Indies and French Guiana, and to promote translational research; two major characteristics of the research conducted in the Institut Pasteur international network.

The designation of the National Reference Centres (NRC) for the period 2012-2016 has led the French Institute for Public Health Surveillance (InVS) to renew its confidence in the laboratory of parasitology of the Institut Pasteur in French Guiana (IPG), which for more than 25 years, has monitored parasite resistance to antimalarial treatments in French Guiana. The NRCs for arboviruses, *influenza* and hantaviruses (see LIP-G n°1), thus bring to four the number of CNR associated laboratories for the French West Indies (FWI) and French Guiana (FG), hosted by the IPG.

Recognition of the expertise gained throughout the last decades by the NRC teams of the IPG is also due to the Pan American Health Organisation, which since May 2012, has included the laboratory of parasitology in the list of official partners of the Amazon network for the surveillance of antimalarial drug resistance.

Beyond this recognition, the renewal of the NRCs is an advantage for conducting their research work. Indeed, collaborations established to carry out surveillance missions entrusted to the NRCs, lead to the regular receipt of strains with which it is possible to conduct studies. Through close working relationships built over time, they also enable the development of strong research partnerships, as with the University of FWI and FG or the medical teams of the public hospitals, on the basis of hypotheses derived from the analysis of these surveillance data.

Continuity between surveillance and research provides a guarantee that the research carried out by all the IPG's teams is appropriate in the context of the epidemiological reality of the pathogens of FWI and FG and also in relation to matters of prevention, diagnosis, treatment or monitoring of concern to field workers, doctors and/or public health professionals.

Several illustrations are provided in this issue. First, by the results of a study conducted by the Laboratory of virology regarding the virological surveillance of dengue in Saint-Martin and Saint-Barthélemy based on blood collected on filter paper. After the operational aspects have been field tested during the dengue epidemic that occurred in 2007 in Paraguay, laboratory work has validated its use in serology and molecular biology. Its implementation in these two islands, with the assistance of the Regional Unit of the InVS in FWI and FG and the active participation of private laboratories, now makes it possible to have a thorough knowledge of the circulation and distribution of dengue serotypes (which was not previously the case). This information is a key element to anticipate the magnitude of future epidemics.

A second example concerns a study carried out by the Medical Entomology Unit in order to explain epidemiological situations for malaria encountered in French Guiana which can not be explained on the sole presence of *Anopheles darlingi*.

Further example: after having demonstrated through serological surveillance, three human cases of hantavirus infection in French Guiana since 2008, the Laboratory of virology and virus-host interactions Laboratory have just characterised the complete genome sequence of the implicated virus.

Finally, a study of plant chemodiversity in French Guianese Amazonia to search for natural insecticides has been launched in partnership with the laboratory of amazonian natural substances of the Joint Research Unit-Ecofog to address the problem of resistance of disease vectors to insecticide molecules currently used in French Guiana.

Dr Philippe Quénel, Director of IPG

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## ● Public Health

### The IPG is reappointed as National Reference Centre for Malaria for the French West Indies and French Guiana.

Lise Musset, Laboratory of parasitology

The constant adaptation of the parasites responsible for malaria to the environment in which they evolve generates more or less rapidly, but systematically, the emergence of parasites resistant to the molecules used to treat or prevent malaria.

Monitoring the levels of sensitivity of the parasites is therefore essential for adapting the therapeutic policies.

The renewal of NRC's mandates for the period 2012-2016 has led the French institute for public health surveillance (InVS) to reaffirm its confidence in the IPG's Lab of parasitology which, for more than 25 years, has carried out the monitoring malaria resistance in French Guiana. Each year, with the active participation of field partners, the laboratory collects over 500 samples (39.4% of diagnosed cases in 2011). The data analysis showed that the drugs currently prescribed in French Guiana are effective in this area. As expert for the health authorities, the NRC is also involved in: i) the evaluation of rapid diagnostic tests, in collaboration with the parasitology laboratory of Cayenne Hospital, ii) the investigation of entomo-epidemiological transmission foci and iii) the public awareness activities about malaria. A close collaboration has also been established with various local actors working on malaria including the Infectious Diseases Unit of Cayenne Hospital for the monitoring of antimalarial drug efficacy for the treatment of malaria.

In addition to its public health tasks, the malaria NRC also conducts research programs. The projects developed in recent years have focused on : i) studying the mechanisms of resistance to antimalarial drugs acting at the parasite's digestive vacuole level and ii) developing new projects focusing on *P. vivax* and more particularly on the parasite population dynamics in French Guiana.

To meet the specifications of InVS for the next 2012-2016 period, the two former NRCs that dealt with malaria (NRC for malaria Resistance in French Guiana and NRC for malaria in France) were combined into a single centre. Its organization was defined to take into account the different aspects of the epidemiology of malaria in France, *i.e.* :

- endemic areas (the island of Mayotte and French Guiana) where malaria is endogenous and must be subject to constant monitoring;
- areas where malaria is not endemic but where the occurrence of imported cases, associated with the presence of vectors requires constant monitoring of cases: French West Indies, La Réunion and parts of the coastal areas in French Guiana;
- an area where transmission is accidental and where the encountered cases are imported by travellers: mainland of France.

*In fine*, the malaria NRC is now composed of four laboratories. These four labs are grouped into two divisions with tasks being distributed as follows:

- The French Guiana and French West Indies centre formed by the parasitology laboratory of the IPG, which is responsible for expert biological work on the samples collected in French Guiana and the French West Indies (the extension to the FWI is an innovation compared to previous terms). In these transmission areas, epidemiological monitoring of cases is the responsibility of the regional InVS Unit (Cire);
- The mainland France - Indian Ocean Centre comprising three parasitology laboratories: Bichat Hospital, Pitié-Salpêtrière Hospital (coordinator) and the Army Institute of Biomedical Research. It is responsible for monitoring the epidemiology of imported cases in the mainland of France and for biological expertise of the samples collected throughout the above territory.

### The IPG becomes an official member of the surveillance network for resistance to antimalarials in the Amazon (RAVREDA).

Eric Legrand, Laboratory of parasitology

The Amazon network for the surveillance of antimalarial drug resistance was created in 2001 by the Pan American Health Organization (PAHO), Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, Suriname and Venezuela to meet the challenges of resistance of *Plasmodium* to antimalarial drugs in this region of the world.

In 2001 also, the Amazon initiative against malaria (AMI), funded by the US Agency for International Development (USAID), was created to fund and provide technical support to countries in South America as part of a program of control and elimination of malaria.

Since 2003, representatives of French Guiana involved in combating malaria, particularly the Institut Pasteur in French Guiana (IPG) and the Regional Agency of Health (ARS), have joined the RAVREDA as observers and have since participated in the meetings organized by this network.

The objectives of RAVREDA have evolved over time to now include the various components of the Regional Strategic Plan 2006-2010 to control and eradicate malaria in the Americas. Thus, RAVREDA has established links with the countries of Central America and the Caribbean expanding its network of malaria surveillance.

Since May 2012, the IPG is officially a partner of RAVREDA. This partnership is a recognition by the PAHO of the public health activities and research that the IPG conducts in combating malaria in French Guiana.

## Blood filter paper dedicated to the surveillance of dengue

Séverine Matheus, Laboratory of virology, NRC for arboviruses

Séverine Matheus, Jean Loup Chappert, Sylvie Cassadou, Franck Berger, Bhetty Labeau, Laetitia Bremand, Alain Winicki, Patricia Huc-Anais, Philippe Quénel, Philippe Dussart. *Virological surveillance of dengue in Saint-Martin and Saint-Barthélemy, French West Indies, using blood samples on filter paper* *Am J Trop Med Hyg*, 2012; 86 (1): 159-6.

Virological surveillance of dengue serotypes circulating is one of the missions of the National Reference Centre for Arboviruses (NRC) for the French Guiana and French West Indies. For the surveillance to be conducted under optimal conditions, the biological samples must be transported respecting the cold chain in order to maintain the integrity of the virus. This logistics constraint and the associated costs are a limitation in remote areas with no local specialized laboratories as it is the case in the islands of Northern Guadeloupe, Saint-Martin and Saint-Barthélemy.

To strengthen the virological surveillance of dengue in these islands, the NRC has established a procedure for collecting and delivering biological samples based on the collection of blood on filter paper for dispatch in an envelope at ambient temperature. This approach, tested in Paraguay in 2007, had shown its capacity to mitigate the routing and cost constraints related to shipping samples, while allowing the realization of diagnostic techniques for dengue.



:: Blood paper filter capillary sample

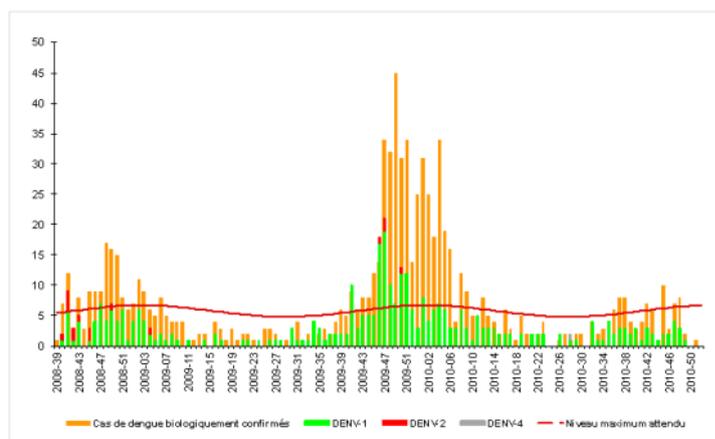
From September 2008, this approach has been implemented in Saint-Martin and Saint-Barthélemy. Two private laboratories, one in each island, participated in this project. According to protocol, the samples of patients tested positive for the NS1 protein were sent to the CNR for serotyping. For each patient sample, two drops of whole blood absorbed on filter paper were stored at +4°C until shipment at room temperature to the CNR, at a frequency depending on the epidemiological context. Once analyzed by RT-PCR (reverse transcription polymerase chain reaction), the results were sent to the sampling laboratories and to the InVS Unit in the French West Indies and French Guiana region (Cire AG).

Between September 2008 and December 2010:

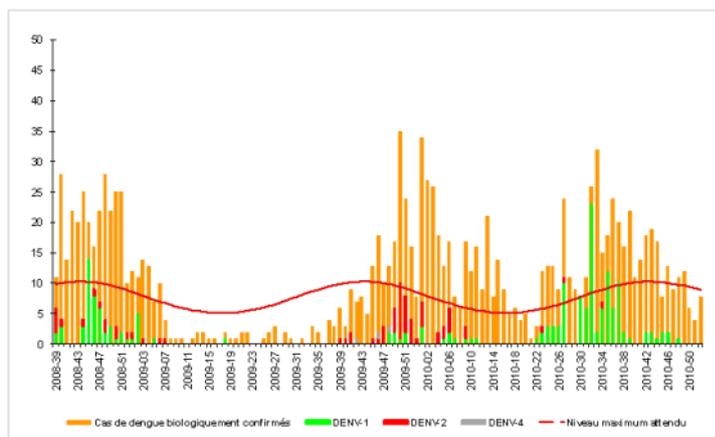
- Among the 378 biological samples sent by the Saint-Barthélemy laboratory, analyses have detected serotype in 95% of the samples and show a predominant circulating DENV-1 (89% ; n = 336) over the two epidemic waves that occurred in the island during this period (Figure 1);
- Among the 288 samples received from Saint-Martin, 86.9% were serotyped : 71.8% DENV-1, 26.6% DENV-2 and 1, 6% DENV-4. These data have also made it possible to observe a reversal of the serotypes circulating in the three successive epidemics of dengue fever that prevailed in Saint-Martin in

this period. Whereas DENV-1 had the highest incidence in the first and third outbreaks, the second epidemic wave was related to serotype DENV-2 serotype (Figure 2).

:: Figure 1. Weekly number of biologically-confirmed cases of dengue fever, and weekly distribution of serotypes, Saint-Barthélemy, S2008-39 to S 2010-50.



:: Figure 2. Weekly number of biologically-confirmed cases of dengue fever, and weekly distribution of serotypes, Saint-Martin, S2008-39 to S 2010-50.



In 2011, the epidemiological situation of dengue in Saint-Martin and Saint-Barthélemy was marked by sporadic transmission. In fact, a low number of positive samples on filter paper were sent to the CNR. Seven samples from Saint-Barthélemy were analyzed and all were DENV-1. Similarly, 13 samples sent by the Saint-Martin laboratory were analyzed and nine were positive for the DENV-1 (n = 7) and DENV-2 (n = 2).

Overall, this mechanism has enabled the implementation of a continuous virological surveillance of dengue serotypes circulating in these islands through a simple and lower cost methodological approach. Its use could be extended to other countries or territories, in particular in the Caribbean, when specialised laboratories are not available.



:: Remarks by the Pasteurian

François Rodhain (1996)

"We have always done medical entomology at the Institut Pasteur, since its inception and since the birth of what became the Institut Pasteur International Network.

Shown, for example by our reference collection dating back to insects collected by Laveran .....

● Research

## Identification of new species of *Anopheles* implicated in malaria transmission in French Guiana.

Romain Girod and Isabelle Dusfour, Unit of medical entomology

Dusfour I, Issaly J, Carinci R, Gaborit P, Girod R. Incrimination of *Anopheles intermedius*, *An. nuneztovari*, and *An. oswaldoi* as natural vectors of *Plasmodium falciparum* in French Guiana. *Mem Inst Oswaldo Cruz*, 2012; 107 (3): 429-432.

Malaria remains a major public health issue in French Guiana. The disease is well established in the interior of the territory where transmission intensity varies between regions and seasons. It remains sporadic in the coastal area where the majority of identified cases are imported, these ones still often being the cause of local transmission. More than 1200 cases of malaria were reported to the health authorities in 2011.

Malaria transmission is primarily achieved by the mosquito *Anopheles darlingi* in French Guiana. This species has a wide distribution in the territory where females are known to bite humans in their domestic and peridomestic environments from dusk to dawn. Historically, it was the only species regularly found infected by *Plasmodium falciparum*, *P. vivax* and *P. Malariae*, which are the three parasites that cause the disease in French Guiana.

Entomological investigations conducted during the 2000s in endemic areas (notably the Maroni River) by team members of the Medical Entomology Unit have confirmed its major role in malaria transmission. Nevertheless, certain local or seasonal epidemiological situations could only be explained with some difficulty based on the sole presence of *An. darlingi*.

Some twenty other Anopheline species are described in French Guiana, whose role in malaria transmission is still uncertain.

As part of study programs undertaken since 2006, three other species were found to be naturally infected by malaria parasites : *Anopheles nuneztovari*, *An. intermedius* and *An. oswaldoi* :

- *Anopheles nuneztovari* and *An. intermedius* are species that are mainly confined to the interior of the territory but are also present on the coast. Females frequent open spaces such as forest clearances where they bite humans. Female carriers of *P. falciparum* were collected in the Saint-Georges and Cacao areas;
- *Anopheles oswaldoi* is a known species of the interior of French Guiana. Females appear less anthropophilic but they nonetheless bite humans, even in broad daylight! A female carrier of *P. falciparum* was collected at a forest clearance located on the banks of the Camopi River.

These results are not without implications for the definition of measures to prevent and combat malaria in French Guiana. Indeed, if *An. darlingi* remains the major vector of malaria in the human environment in villages, the role of *An. nuneztovari*, *An. intermedius* and/or *An. oswaldoi* in malaria transmission in agricultural areas or in forest camps, at dusk, during the night, at dawn and even during the day, must be considered. Beyond any chemo-prophylactic measures, if the use of bed nets or hammocks should be the rule at night or during naps, the complementary use of repellent should be considered in the early morning or evening or even during the day in situations of high exposure.

## Genomic sequence of the Maripa virus

Séverine Matheus (Lab of Virology), Anne Lavergne (LIVH), Benoît de Thoisy (LIVH) and Vincent Lacoste (LIVH)

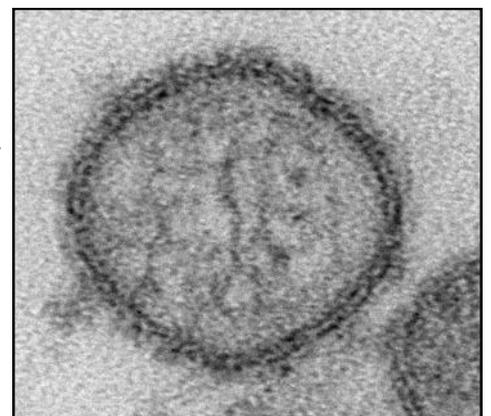
Matheus S, Lavergne A, de Thoisy B, Dussart P, Lacoste V. Complete genome sequence of a novel hantavirus variant of Rio Mamoré virus, Maripa virus, from French Guiana. *J Virol*. 2012 May; 86(9):5399.

After having highlighted, since 2008, three human cases of hantavirus infection in French Guiana, the Virology Laboratory, which hosts the National Reference Center (CNR) for Hantavirus for the French West Indies and French Guiana, and the laboratory for virus-Host interactions have published, the complete genome sequence of the incriminated virus (<http://jvi.asm.org/lookup/pmid?view=long&pmid=22492924>), in the May edition of the *Journal of Virology*,

Called "Maripa" it belongs to the family *Bunyaviridae*, genus *Hantavirus*. It is responsible in humans for a cardiopulmonary syndrome reflecting a severe respiratory illness accompanied by high fatality, and for which there is currently no treatment or vaccine.

Viruses of this family are composed of a single-stranded RNA genome of negative polarity, segmented into three fragments S (Small), M (Medium) and L (Large). The percentages of identity of the Maripa virus are respectively 97.7%, 96.4% and 95.8% for the three segments with the Rio Mamoré virus, its closest relative on an evolutionary point of view, previously identified in Bolivia.

Based on these results and according to the criteria of the International Committee on Taxonomy of Viruses, the Maripa virus is a variant of the Rio Mamoré virus.



: virus Sin nombre

Source CDC Atlanta

"courtesy of Cynthia Goldsmith and Luanne Elliott"

## ● Research

### French Guianese Amazonian chemodiversity serving research for natural insecticides

Emeline Houël (UMR Ecofog–LSNA) and Isabelle Dusfour (IPG–Unit of medical entomology)

On 10 May 2012 the first steering committee of the program ERDF founded project INSECTICIDES was held in the presence of Anne Corval, Director, CNRS USR 3456 French Guiana, Didier Fournier, French Guiana DRRT and Quénel Philippe, Director of the Institut Pasteur in French Guiana, as well as Mrs. Murielle Chen-Kuo Chang, Project Manager of the Research Innovation Department of the Regional Council, and representatives of project partners teams (UMR EcoFoG, CNRS French Guiana, [UMR Qualitrop](#), UAG, IPG/Medical Entomology Unit, [French Guiana Technopole](#)).

The INSECTICIDES program aims to study chemodiversity in the Amazon for the identification of natural insecticides of plant origin. The development of the project is based on simple observations. In French Guiana as elsewhere, nuisance insect populations, vectors of disease or crop pests, are developing resistance to the insecticide molecules used.

Moreover, research does not currently provide fully satisfactory molecules, because of cross-resistance, the excessive persistence of certain products in the environment and their harmfulness vis-à-vis non-target insects. Operational aspects of vector control are therefore limited in combatting these insects.

However, some studies show that plants have chemical defenses providing natural protection from insects. The study of these natural substances seems to be a way to address the problems of specificity and innovation in the search for new insecticides. The INSECTICIDES program thus proposes, by the study of French Guianese plant biodiversity, to take part in this research using two models of interest to the economy and health of local populations: termites and *Aedes aegypti* mosquitoes, vector of arboviruses, and in particular of dengue.

## ● Training/ raising awareness

### Molecular epidemiology and evolutionary genetics of the infectious diseases in Latin America

La Paz, Bolivia from 25 to 27 April

Isabelle Dusfour (UEM), Vincent Lacoste LIVH)

Isabelle Dusfour and Vincent Lacoste attended the conference "*Molecular epidemiology and evolutionary genetics of Infectious Diseases In Latin America*" held in La Paz in Bolivia from 25 to 27 last April\*.

This workshop was organized under the auspices of IINSAD (*Instituto de Investigación y Salud y Desarrollo*), Office of the Institute for Research and Development in La Paz and the Cultural Services of the Embassy of France in La Paz. The objective of this workshop was to link researchers from Latin America, working on infectious diseases.

The topics treated included bacteriology parasitology, virology, entomology and human genetics. Over 100 participants from Argentina, Bolivia, Brazil, Colombia, Ecuador, France, French Guiana, Mexico, Peru, Spain, USA and Venezuela attended 22 plenary lectures and 6 symposia led by a total of 46 speakers. Isabelle Dusfour and Vincent Lacoste presented a seminar dealing with "mosquito vectors of viruses in French Guiana" and "ViRUSES and STRonGer projects", respectively.

After this conference it was decided to establish an international collaborative network for research on genetics and evolution of infectious diseases in Latin America (LAN-MEEGID: Latin American Network of molecular epidemiology and evolutionary genetics of infectious diseases). Following the success of this first meeting, it is planned to organize a second one in 2014 at *Pontificia Universidad Católica del Ecuador* in Quito, Ecuador.

\* [http://www.colloque.ird.fr/workshop\\_enfermedades\\_infeciosas/](http://www.colloque.ird.fr/workshop_enfermedades_infeciosas/)

### First scientific seminar

Cayenne, 26 June

Christophe Duplais (UMR Ecofog–LSNA)



The first seminar of the STRonGer program was held on Tuesday 26 June at the IPG. The Laboratory of Natural Amazonian Substances (LSNA), with responsibility for the choice of the guest, had invited Bruno Figadère (CNRS, director of UMR Biocis, University ParisSud) whose research concerns the chemistry of natural substances for therapeutic purposes.

Bruno Figadère, author of 122 publications has won national and international awards. His team has recently developed a particularly innovative method for screening antimalarial compounds which consists in detecting by mass spectroscopy (MS) the adduct formed between the heme of the hemoglobin molecule and an antimalarial molecule. Within minutes, the analysis allows a first screening of an extract from plants, insects or microorganisms with a success rate well above the existing screening methods (score hit-to-lead: 47% on strains resistant to chloroquine against 6% generally). The parasitology laboratory of the IPG and LSNA, working in collaboration under the STRonGer program, will benefit from this new technique and so target candidate molecules from the Amazon region faster. In the immediate aftermath of the seminar, a press conference followed by interviews with researchers allowed, the same evening, a report to be broadcast on the TV news.

This seminar was the opportunity to launch a quarterly scientific meeting, organized in the framework of the STRonGer program, to the whole scientific community of French Guiana. The next seminar will be held in October and will focus on techniques for high-throughput sequencing, with the involvement of Christiane Bouchier of the Institut Pasteur in Paris.

## ● Portraits

### Isabelle Dusfour

Deputy Head of the Medical Entomology Unit joins the research executive at the Institut Pasteur

#### What is medical entomology? What is it for?

Medical entomology is the science of the arthropods (insects, mites ...) which cause or transmit human disease. This discipline includes many species of arthropods and includes diverse areas of research. The studies that are undertaken aim at better understanding the organism causing the disease or transmitting it to, *in fine*, effectively combat it.

#### Following your post doc in the USA, why did you choose the IPG in order to carry through your research career ?

Throughout my activities, I had intended to conduct research applied to vectors of tropical diseases. So, through its geographical location and the orientation of its programs, the Medical Entomology Unit of the IPG offered me the opportunity to work in optimal conditions both in the field and the laboratory. Moreover, the involvement of the Institute in the French

Guianese public health system was an asset to understand local issues and develop appropriate research programs.

#### What are the main areas of your current research?

Most of my research activity is devoted to the study of insecticide resistance and improved vector control.

My research program aims to identify mechanisms of resistance in the mosquito *Ae. aegypti* and the factors that impact them. I also work in collaboration with other teams on the identification of new molecules and methods used for vector control. Lastly, I supervise a project on the anopheles-environment-transmission relationship for malaria that fits into one of the key themes of the unit which is the study of malaria vectors.



..Isabelle Dusfour

#### You just succeed in the competitive examination to join the research executive of the Institut Pasteur. What does it mean for you?

First of all, it means the recognition of three years work within the IPG and the assurance of support from my institution for the themes which I have chosen to develop. It also allows me to project serenely in the medium term both my work and my private life. Thanks to this continuation, I will also see the completion of the new entomology building, fruit of several years of work and design in the framework of the STRonGer program.



..Jessica Casteras

#### When and in which context did you join the IPG?

It is the reputation of the Institut Pasteur that encouraged me to apply in 2008 as a laboratory technician, microbiology sector, in the Laboratory Hygiene and Environment (LHE).

#### What were your previous training courses?

I hold an undergraduate degree in molecular genetics. Following my training, various opportunities have led me to work in different sectors such as food microbiology, agricultural science, medical research or medically assisted procreation. All these experiences were very rewarding and enabled me to expand my skills.

#### What was your professional development within the IPG?

Initially, I was a microbiology technician at the LHE. The activity was dispatched between analyses of samples of water intended for human consumption and analyses of food samples. I was looking for contaminating microorganisms such as *Legionella* in the cooling network of electric power stations, or *E. coli* in food. Each year, an important part of the activity was also devoted to activities related to the ATV launch, the Automated Transfer Vehicle responsible for refuelling and repositioning of the International Space Station. The personnel of the space centre and the LHE were conducting air and surface sampling on the ATV and I was responsible, with my colleagues, for culturing all these samples and identifying pathogens present. This activity constitutes a heavy workload, requires a lot of availability and involvement, including periods of night and/or weekend work. I joined the parasitology laboratory in March 2012.

#### What activities do you currently carry out in the parasitology laboratory?

This laboratory hosts the National Reference Centre for Malaria whose daily work is to culture samples of *P. falciparum*, the causative agent of malaria, and to carry out tests of chemosensitivity to antimalarial drugs on these parasites. The objective is to establish whether parasites analysed are sensitive or resistant to one of the 11 molecules tested routinely. The different strains are then stored in collections.

The second part of my activity involves research activities. I thus participated in work concerned with the *pfmdr1* gene, involved in resistance to mefloquine.

### Jessica Casteras

Laboratory technician at the IPG since 2008

# ● The IPG story

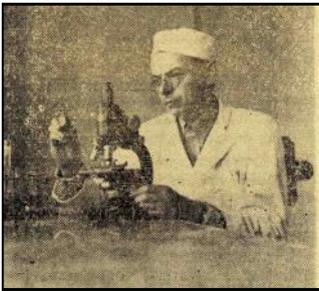
## :: Second episode\* : 1940–1948

The team led by Dr. Hervé Floch sets up the new institute in a particularly difficult global context in which supply problems with mainland France expose French Guiana to major health risks, especially towards vaccine-preventable diseases.

A large inventory of infectious pathologies is also started opening the first avenues of research.

In 1946, with departmentalisation, the Institut Pasteur of French Guiana and the Territory of the Inini becomes the Institut Pasteur of French Guiana.

The first team of the Institute consists of the Doctor Captain Hervé Floch, the Doctor Captain Pierre de Lajudie and the first class principal male Nurse Emile Abonnenc; four nurses, four assistant-manipulators and an orderly come to complete this team of pioneers. It was reinforced in 1942 by a technician in the person of Chief Warrant Officer nurse Emile Chassignet. It remains unchanged until 1946, year when the Doctor Captain Camain replaces Pierre de Lajudie.



:: Hervé FLOCH,  
Director of the Institut Pasteur in  
French Guiana 1940 -1957

By contract concluded on 29 November 1941 between the Government of French Guiana and the Inini Territory and the Institut Pasteur in Paris, the new Institute is at the disposal of various medical services "of the Colony, the Army and the Prison Administration".

From the beginning, its guiding principles are well defined: clinical analyses (microbiological, parasitological, serological and biochemical), public health activities and research.



:: Laboratory of bacteriology

In 1941, the Institute carries out 28,036 tests for the benefit of the hospital, dispensaries, schools but also for a large part - 4027 - for the benefit of veterinary services.



:: Laboratory of chemistry

During the dark years of the Second World War, difficulties of supply with Metropolitan France are a major problem and may lead rapidly to a crisis situation, particularly towards vaccination. By 1941, vaccine production is started with 9070 ampoules of vaccine prepared in the same year.



:: Laboratory of organic chemistry

In 1942, the Institute makes not fewer than twelve different vaccines including BCG and typhoid-paratyphoid vaccine and in 1943 there are more than 31,000 ampoules vaccines that are produced (1943 is the year that vaccine production reached its maximum, the supply becoming normal afterwards).

In parallel, a large inventory of local infectious disease started. Over the years, it will cover increasingly diverse diseases: blastomycosis, brucellosis, Chagas disease, bacillary dysentery, helminthiasis, cutaneous leishmaniasis, leprosy, leptospirosis, malaria, salmonellosis, spirochetosis, treponematosi, tuberculosis, to mention only the principal ones. This inventory also extends to veterinary pathology, as well as local features, such as papillonite, medicinal plants, larvivorous fish.

As of 1944, the Institute also functions as colonial dispensary and the director of the Institute is also the director of the Bureau of Hygiene and of the Department combatting malaria and yellow fever. It is thus responsible for entomological studies, bacteriological analysis of water and food products, and veterinary analysis for the Colony.

In 1946, the French Overseas Department is created: the territory of the Inini became one of the two districts, called Saint-Laurent-du-Maroni. The institute then becomes the **Institut Pasteur of French Guiana**. The contract with the Institut Pasteur is renewed with the Department of French Guiana on 8 November 1948.

## LIP-GUYANE #2

:: The newsletter of The Institut Pasteur in French Guiana

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