CERMES (Pasteur Institute of Niger)

The missions:

- a basic, applied and operational, in medical and health fields;
- Support for national institutions and services and possibly to any other state, for everything related to laboratory medicine and public health;
- The expertise of risks and evaluation of programs against endemic diseases;
- Training of health cadres, domestic or foreign.

The CERMES Branch is assured since March 2012 by Odile Ouwe Missi-OUKEM

Research

1. Biology (Bacteriology-Virology) (UBIOL)
2. Medical Entomology (EMU)
3. Parasitology (UPARA)
4. Epidemiology-Health-Environment-Climate (EUSEC)

Three main themes

- **Bacterial meningitis**
  1. Impact of MenAfriVac vaccine
  2. Asymptomatic Portage
  3. Negative CSF
  4. Mortality
  5. Aftermath
  6. Infections pneumococcal

- **Malaria**
  1. Genetic diversity of parasites and anophelines populations
  2. Efficiency based combination Artémisineine
  3. Impact of massive campaigns of distribution of mosquito nets (LLINs)
  4. Comparison of methods of distribution of LLINs

- **Relationships Health-Environment-Climate**
  1. Analysis of spatiotemporal meningitis
  2. Special features of urban malaria
  3. Thresholds Alerts

- **A New Theme Respiratory Infection Aigues IRAs (in development)**

- **Other issues of interest**
  1. Antimalarial Resistance
  2. Resistance to insecticides
  3. Antimicrobial Resistance
• National Reference Laboratories (NRL)
  1. Diagnosis and Surveillance of Meningitis
  2. Diagnosis and Surveillance of Influenza
  3. Diagnosis and Monitoring of Cholera and other Gastroenteritis
  4. Surveillance of Antimalarial Drug Resistance
  5. Coordination of the National Network of Laboratories

• A strip production unit
  ▪ Production of strips for the rapid diagnosis of meningitis A, C, W, Y

Meningitis
  o Surveillance of meningitis in Niger
  o Microbiological monitoring of meningitis
  o Rapid diagnostic test

Research activities

• Cerebro-spinal Study of negative fluid samples
  ▪ Evaluate the diagnostic conduct face a suspected case of meningitis, performed in the medical courses and know the potential pathogens involved Atres than those detected by surveillance.

• Studies sequelae after meningitis
  ▪ The main objective is to estimate the incidence of bacterial meningitis sequelae in Niger in the range of three to six months after the meningitis episode, and the relative risk compared to the general population.

• Study and carry immunity (MenAfriCar)
  ▪ The objectives are:
    • The identification of carriers of meningococcal meningitis in countries of the meningitis belt Africa.
    • Characterization of porting dynamic among the holders of families and what will be the impact of vaccination with the new conjugate vaccine A.
    • The investigation of the relationship between the carriage of potentially pathogenic meningococci and Neisseria spnonpathogenic before and after vaccination with the new conjugate vaccine A.

• This research project initiated by Brian Greenwood (London School of Hygiene & Tropical Medicine) and funded by the Wellcome Trust / B. Gates Foundation and associate on seven countries in the African meningitis belt: Chad, Ethiopia, Gambia, Ghana, Mali, Nigeria and Niger (with two associated countries: Burkina Faso and Senegal).

International Collaborations

• National Centre of Reference and Neisseria Neisseria Unit, Institute Pasteur, Paris: Dr Muhamed Taha K
• Technical Platform PT5, Institute Pasteur, Paris: Dr Farida Nato
• Preventive Medicine Association, Paris: Dr. Judith Muller, Betty Lafourcade, Dr. Alfred Da Sylva
WHO Collaboration Centre for meningococcal IMTSSA / Le Pharo, Marseille: Dr Pierre Nicolas
Health Protection Agency (Manchester Medical Microbiology Partnership), Manchester, UK: Dr Ray Borrow
Muraz Center, Bobo Dioulasso, Burkin Faso: Dr Yves Traore
R. Piqué Hospital (Bordeaux): Dr. Jean-Louis Koeck
National Reference Center pneumococci, European Georges Pompidou Hospital, Paris
International Network of Pasteur Institutes (Cameroon, Bangui, Dakar, Ivory Coast, Paris)

Malaria

Head of Parasitology Unit: Rabiou Labbo

Research

- Participation in the management of malaria cases
  2. Equipment of a technical platform for carrying out tests in vitro and in addition molecular in vivo tests.

- Vector control and reduction of transmission.
  1. Intra Home residual spraying (IRS)
  2. Especially the distribution of LLINs.
     - Evaluation of sensitivity of vectors to épandus insecticides and used to impregnate the nets.
     - Evaluation of the impact of PID campaigns on the transmission and Resistances.
     - Measuring the impact of universal coverage of LLINs in the transmission, the parasite and species of anopheles, and finally the behavior of vectors
     - Vector transmission study in urban areas.

International Collaborations

- Network of Pasteur Institutes (Madagascar, Cambodia, Guyana).
- Institute of Tropical Medicine of the Army Health Service (Marseille, France).
- Pasteur Institute (Paris).
- Massachusetts Institute of Technology (Boston, USA).

The areas of expertise are:

- Molecular epidemiology of malaria.
- Ecology and dynamics of vector populations.
- Environmental factors related to the parasite portage.
- Surveillance of resistance of P. falciparum to antimalarial drugs and insecticide anopheles.
- Biological diagnosis of malaria microscopy, rapid tests and molecular tests.
Training and receiving trainees.

**Health / environment-climate** - Jean-Paul Moulia Pelat, MD, PhD, Epidemiologist, Head of Unit Epidemiology / Health-Environment-Climate

This link is quantified measure of risk corresponding to the probability that an individual suffers harm or harm to his health if exposed to danger especially of environmental origin. Advances in statistics, epidemiology now allow this quantification. Relational database management systems and geographic information systems (GIS) allow to optimally exploit monitoring data in the study of the link between disease and the environment.

- The seasonality of meningitis and malaria
  - In the Sahel, seasonal variations in malaria cases are strongly related to climate variations including rainfall.
  - Outbreaks of meningococcal meningitis are, too, because of the marked seasonal role of certain climatic factors (humidity, dust) and limited to certain areas.

- The themes include:
  - GIS-monitoring: health card and spatiotemporal distribution of meningitis
  - Study of the link between disease and the environment.

- The activities include:
  - develop the tools and resources necessary for spatial and temporal analysis of the transmission of malaria and meningitis
  - collect environmental and climate information at scales compatible with health data, in time and in space and establish collaborations with specialized agencies to identify and get the most relevant climatic and environmental parameters
  - measure the risk posed by environmental factors in the occurrence of a disease
  - Develop training in the field of environmental health.

**Research**

- Digital support national health map Niger
- Spatiotemporal distribution of meningitis
  - Spatial and spatio-temporal clusters identified during the 2002 season - 2009 (N. meningitidis and S. pneumoniea)
- Environmental health: study of the relationship between climatic factors / meningitis and malaria

**Public health**
Flu: NRL for the monitoring and diagnosis of influenza - Coordination: Jean-Paul MOULIA PELAT, PhD, Epidemiologist, Head of the Unit of Epidemiology / Health-Climate-Environment

- Influenza surveillance in Niger
- The main objectives are:
  - The description of seasonal influenza (A and B) in terms of seasonality (approach), its geographic distribution and epidemiology.
  - Antigenic and genetic comparison of strains circulating in Africa (dynamic genetic diversity of influenza viruses).
  - The measurement of antiviral resistance strains isolated

- International Collaborations
  - WHO Collaborating Centre for Reference and Research on influenza viruses and other respiratory viruses, Institute Pasteur, Paris.
  - WHO Influenza EQAP Working Team, Hong Kong

Training

- Activity with two main directions:
  - Laboratory Technician Refresher Course
  - Regional thematic scientific workshops
  - Mémoires Master, and ingénioriat of doctoral thesis
  - Stages And memories of the National School of Public Health and Institute of Public Health, Niamey
  - Stages Scholars (International Youth)

- During National Malaria
  - The National Malaria Course (NOC) is the result of collaboration between the Faculty of Health Sciences of the University Abu Moumouni (FSS / UAM), the National Program against Malaria (NMCP), the Hospital Niamey National (HNN) and the Center for Medical and Health Research (CERMES).
    - The goal: train scientists and stakeholders in the fight against malaria by using internet search engines under the supervision of a facilitator.