Institute Pasteur in Dakar (IPD)

- Contribute to public health
- Conducting activities recherché, education, training, medical examinations, epidemiological and biological and production of yellow fever vaccine.

MISSIONS

- Research activities meet national public health priorities and international.
  - Viral diseases (arboviruses and hemorrhagic fever viruses, influenza viruses, enteroviruses, emerging viruses), malaria, enteric bacteria and monitoring of bacterial resistance to antibiotics.
- Public health activities
  - Epidemiological surveillance.
- Service activities
  - Laboratory of food safety and environmental hygiene
  - International center for vaccination and a rabies treatment center.
- Training activities
- Production of yellow fever vaccine is a historical specificity of the IPD.

Analyses and Immunization

1- The Analysis Laboratory of Medical Biology

Laboratory equipped latest instruments, fully computerized registration of the bulletin analyzes the rendering of biological results.

- Involved in two external quality control programs and the French national control of biological analyzes.
- Engaged in an ISO 15189 accreditation process.

2- Water and Food (LSAHE) - Head: Prof. Amy GASSAMA SOW, e-mail: gassama@pasteur.sn

The Food Safety Laboratory and Environmental Health (LSAHE) established in 1996. Activities are safety and food hygiene and the environment.

- Microbiology of food products and environments, Water Microbiology, Microbiology surfaces, Physical chemistry of water, Food Chemistry

RESEARCH ACTIVITIES

- Risk assessment in food microbiology
- Legionella Risk Investigation in hotels and hospitals

INTERNATIONAL ACTIVITIES

- Participation in quality assurance in the context of the NSG with WHO
• Support the activities of other food microbiology laboratories in the UEMOA zone

3- The Vaccination Centre & Treatment rabies

Research

1- Experimental Bacteriology – Head: Dr. Amy Sow Gassama

• Activities on diarrhea: Molecular biology and applied technology & Understanding the spread of strains antibiotic resistance.
  o Focused on the phenotypic and genotypic characterization of enteric bacteria: Molecular epidemiology and antibiotic resistance of enteric bacteria.

Theme:

• Etiologies and management of diarrheal diseases: Phenotypic and genotypic characterization of strains of enteric bacteria Escherichia coli diarrhea agents in HIV / AIDS infection
• Molecular mechanisms of resistance and the transfer of antibiotic resistance among enteric bacteria: characterization of genetic carriers of antibiotic resistance
  ▪ Characterization of a new complex integron in strains of Salmonella Keurmassar
  ▪ Characterization of a new class 2 integron in strains of Shigella sonnei isolated in Senegal
  ▪ Identification of the SXT element among Vibrio cholerae strains isolated in Senegal

COLLABORATIONS

• WHO, Food Safety and Zoonosis (FOS), Health Security and Environment (HSE)
• International Vaccine Institute, Korea
• RIIPIA: Associated Institutes IP Bangui, Cameroon Pasteur Centre, Institute Pasteur Cambodia
• Biodiversity Unit Emerging Pathogens Bacteria,
• Unit postulant "Bacterial Genome Plasticity» CNRS URA 2171
• University of Limoges (France): Laboratory of Bacteriology-Virology (EA 3175), INSERM Avenir team
• University of Sassari (Italy): Department of Biomedical Sciences
• University of Santiago de Compostela, Aquaculture Institute, Spain

2- Medical and Environmental Biology – Head: Sébastien Breurec (sbreurec@pasteur.sn)

Most projects of the unit is in collaboration with local hospitals, institutes members of the International Network of Pasteur Institutes and the Institute Pasteur in Paris.
THEMES

- **Resistance to antibiotics**
  - *Staphylococcus aureus* and methicillin resistance.
  - *Enterobacteriaceae* and resistance to imipenem.
  - *Streptococcus pneumoniae*, serotyping and resistance to β-lactams and fluoroquinolones.
  - *Enterobacteriaceae* resistant to cephalosporins of third generation qnr carry the gene.
  - *Salmonella* and resistance to β-lactam

- **Genetic mechanisms of Pathogenesis**
  - *Staphylococcus aureus* and pathogenicity related to Panton-Valentine leukocidin.
  - The cag pathogenicity island of *Helicobacter pylori* and its relation to *gastric cancer*.

- **Genetics of bacterial populations**
  - *Staphylococcus aureus*, *Helicobacter pylori*, *Klebsiella pneumoniae* and *Streptococcus agalactiae*.

- **Clinical Studies**
  - Study of similarities and discrepancies between HIV status and vaccination for hepatitis B of children in Dakar in order to assess the reality of the implementation of the vaccination policy against this disease.
  - Strips validation for rapid diagnosis of various enteric pathogens (Shigella, amoeba).

- **Ecology & Environment Infectious Diseases**
  - Study contamination of water networks of institutions to risk are the hotels and hospitals by *Legionella pneumophila*.
  - Bacteriological risks associated with cross contamination in household kitchens when handling chickens.

COLLABORATIONS

- Pasteur Institute in *Paris* & institutes of the International Network of Pasteur Institute
- National Reference Centre for Staphylococci, Faculty of Medicine, Lyon, France (J. Etienne)
- National Legionella Reference Centre, Faculty of Medicine, Lyon, France (J. Etienne)
- Microbiology Laboratory, Hospital St. Louis, Paris (F. Simon)
- IPATIMUP, Medical Faculty, Porto, Portugal (J. Machado)
- Institute of Medical Microbiology and Hospital Epidemiology, Hannover Medical School, Hannover, Germany (S. Suerbaum)
- Environmental Research Institute, University College Cork, Cork, Ireland (Mr. Achtman)

3- **Immunology**: PAGE UNDER CONSTRUCTION

4- **Medical Virology**: PAGE UNDER CONSTRUCTION
5- Arbovirologie and hemorrhagic fever viruses (UAVFH): Head: Alpha Amadou Sall, Research Fellow PhD

- WHO collaborating center for arboviruses and hemorrhagic fever viruses and a national reference center for rabies.
- Arbovirus surveillance programs and virus viral hemorrhagic fevers.
- Production entity reagents (antigens and immune ascites) for African national laboratories.
- Involved in several investigations of outbreaks of arboviruses and viral hemorrhagic fever (Cape Verde, Ivory Coast, Central African Republic, Mauritania, Burkina Faso, Guinea, Senegal etc.)

Activities

- The development and improvement of diagnostic tools
  - Ebola, Marburg, Yellow Fever, Rift Valley Fever, Lassa fever, Crimean Congo hemorrhagic fever and dengue
  - Serological diagnostic tool for differentiating wild and vaccine for yellow fever antibodies.
- study of virus-vector interactions
  - Molecular analysis of variability of dengue 2 virus during its interaction with the Aedes aegypti mosquito.
  - Study of vector competence of Barkedji Usutu virus in Culex.
  - Study of vectorial jurisdiction of West Nile virus in Culex.
- molecular evolution and phylogeny
- Modeling and risk assessment of emergence of AVFH.
  - Modeling and assessing the risks of emergence of Rift Valley Fever and West Nile (EDEN).
  - Mechanisms of emergence of Dengue and Chikungunya virus in the Kédougou region.

Public health activities

- Surveillance of yellow fever in the WHO network of laboratories yellow fever
- surveillance of arboviruses in culicidienne fauna and vertebrates Wild
- Diagnosis of suspected cases of arboviral diseases or human or animal rabies.

COLLABORATIONS

- Department of Zoology of the University of Pennsylvania Penn State (USA): Dr. EC Holmes
- University of Sao Paulo (Brazil): Dr. A. Zanotto PM
- National Center of Hygiene, Nouakchott (Mauritania): Pr B. Lo, Dr Ba Hampaté
- Institute Pasteur Paris and Lyon: Dr. M. Bouloy, Dr P Despres, Dr L Baril, Dr JC Manuguerra, Dr A Burguière, Dr. H. Zeller,
- University of Gottingen (Germany): Dr. Manfred Weidmann and Dr. Frank Hufert
- University of Texas at Galveston (USA): Professor Scott Weaver, Dr. Nikolas Vasilakis, Dr D Watts
- University of New Mexico (USA): Dr K Hanley
- Yellow Fever Laboratory Network WHO: Dr Annick Dosseh, Dr Fenella Avokey, Dr S Briand
- The University of Texas Medical Branch (UTMB)
- International Centre for Agricultural Research for Development (CIRAD)
- National Institute of Public Health Research (INRSP) Bamako
- National Institutes of Health (NIH)
- Viral Genetic Diversity Network (VGDN)
- Swedish Institute for Infectious Disease Control (SIIDC)
6- Entomology: PAGE UNDER CONSTRUCTION

7- Epidemiology: Head: Adama Tall, Researcher MD, PhD

THEMES, ACTIVITIES AND RESEARCH AREAS

- Clinical Epidemiology of infectious diseases (malaria, arboviral, respiratory viral infections, hepatitis B, typhoid fever)
- Clinical Vaccinology (including HIV and responses to EPI vaccines infection)
- Methodology of biomedical research
- Investigation of epidemics
- Biostatistics and mathematical modeling

In research

- Research in human epidemiology of infectious diseases:
  - Characteristics of the populations in endemic exposure settings (malaria), transitional (introduction of the vaccine against hepatitis B) or epidemic (influenza, yellow fever, typhoid fever).
- The description of emerging and re-emerging diseases

Public Health

Sénégalaise National Centre entérobactérie - Responsable: Dr. Benoît Garin & Dr. Jean Marie Sire

Missions

- Provide expertise in the field of identification, serotyping and antimicrobial susceptibility of strains of Enterobacteriaceae, including Salmonella and Shigella isolated from humans or food samples.
- Also participates in the WHO Initiative twining related Mauritania.
- Also exercised through the recognition of laboratory Food Safety and Environmental Health Reference Laboratory.

The National Polio reference center –

The main activities:

- Isolate and identify polioviruses and non-polio enteroviruses (ENP) from stool samples collected from patients with AFP
- Perform virological surveillance for polioviruses circulating in the environment (healthy population)
- Serve as a reference laboratory for countries with no accredited laboratory by WHO (Cape Verde, Gambia, Guinea, Guinea-Bissau, Mauritania)
CRORA Public Health (WHO Collaborating Centre for Reference and Research for arboviruses and hemorrhagic fever virus)

- Provide services for WHO regional and global interest programs
- Collect, process and analyze seroepidemiological data on AVFH.
- Give the WHO advisory opinions on AVFH
- Participate in the standardization of methods and diagnostic procedures
- Participate in the development of new methods and techniques for the detection and control of AVFH.
- Support countries in epidemiological surveillance and implementation of control measures.

The WHO Reference Laboratory for Influenza National

- The laboratory participates in the Global Monitoring Program Influenza whose main objectives are:
  - Detect outbreaks at an early time and identify epidemiological factors involved
  - Identify areas and high risk populations
  - Collect flu strains to analyze the antigenic characteristics and make recommendations on the composition of the vaccine.

National Rabies Reference Center

- Goals CNR rage
  - Participate in the development of new detection methods and techniques of virus and rabies antibodies
  - Organize monitoring for proper care of rabies in Senegal
  - Contribute to the establishment of an epidemiological data collection system, and clinical and biological control of rabies in humans and animals in Senegal
  - Collect, process and analyze seroepidemiological data on human and animal rabies