Pasteur Institute of Laos

To fulfil activities of public service:

1. Research and diagnostic on **emerging infectious** diseases and **vector borne** diseases
2. Training, Education and Capacity building
3. Technical assistance to National Center for Laboratory and Epidemiology (NCLE) for investigation of epidemics

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Dr. Samlane PHOMPIDA. Former director of the Lao National Center for Malariology Parasitology and Medical Entomology.

Research

Hence, 4 labs were created under this concept:

Lao- French lab for Arbovirology and Emerging viruses

Lao-French Lab for Medical Entomology Lao

Luxembourg Lab for Vaccine preventable diseases

Lao -Japan Lab for Parasitology

The aim of each lab is to carry out research on specific infectious disease agents affecting the public health of the people of Lao PDR, such as **Malaria, Dengue, Chikungunya, Measles, Mumps, Rubella, water and food-borne trematodes** etc.

In addition, IPL has the responsibility to **provide assistance to National Centers** such as National Center for Laboratory and Epidemiology (NCLE) National Center for Malariology Parasitology and Medical Entomology (CMPE) and the National Center for Animal Health (NCAH) to help them improve their diagnostic capacity and participate in outbreak investigations.

Since opening in January 2012, the Institute has been already actively involved in the surveillance identification and genotyping Dengue and Chikungunya viruses, as well as an outbreak of Mumps.

Lao – French lab 1 / Arbovirus and Emerging viral diseases Head of Lab: **Marc GRANDADAM, Ph.D.**

Main objective of the lab:

- In the Indochinese peninsula, "**arthropod borne virus" (arbovirus)** such as dengue, Japanese encephalitis and chikungunya are considered as endemic.
- Comprehensive studies to characterize transmission cycles to the improvement of diagnosis, surveillance and detection of emerging viruses.
- Lao PDR dengue outbreak in 2013 which a co-circulation of chikungunya virus was confirmed. Surveillance remained major activity.
- Invited trainees (Lao nationals) from other institutions to conduct their Master degree internships.

Project carried on in the lab:

1- **Dengue surveillance** in Vientiane city

Partners:

- Institut Pasteur du Cambodge (Ph Buchy ; V Duong). Institut Pasteur de Paris (V. Caro ; J-M. Thieberge).
- Institut de la Francophonie pour la Médecine Tropicale (S. Sompavanh ; Y. Buisson ; F. Quet).
- National Centre for laboratory and epidemiology (D. Phonekeo; K. Pakapak).

2- **Follow up of chikungunya** patients

3- Seeking for arbovirus in ticks (TIBO project)

4- Chikungunya transmission cycles in Lao PDR

- Institut Pasteur du Cambodge (Ph Buchy; V Duong). Institut Pasteur de Paris (V. Caro; L. Diancourt).
- Institut de la Francophonie pour la Médecine Tropicale (S. Sompavanh; Y. Buisson; F. Quet).

- National Centre for Laboratory and Epidemiology (D. Phonekeo; K. Pakapak).

5- Transmission and maintenance of Japanese encephalitis virus in Lao PDR

- Institute Pasteur du Laos, Lao-Luxemburg Laboratory (A. Black). Institute Pasteur de Paris (V. Caro; L. Diancourt).

Lao – French lab 2 / Medical Entomology & Biology of Disease Vectors Head of Lab: **Paul T. Bray Ph.D.**

Main objective of the lab

1- Study the **biology and ecology of arthropod vectors** (mosquitoes, sandflies, ticks, snails, etc.),

- Transmission cycles of the viruses, parasites and other microbial pathogens they transmit.
- Working on ways to mitigate vector borne disease transmission in Lao PDR via vector control training programs.

Project carried on in the lab:

1- **Insecticide resistance in malaria vectors** in Lao and Thailand and capacity building in medical entomology (MALVEC)

- Evaluation of vectors bionomics and distribution and their role in malaria transmission
- Evaluation of the levels, types and mechanisms of insecticide resistance
- Evaluation of the impact of environmental factors on vector dynamic and resistance selection

Partners

- National Center of Malariology, Parasitology and Entomology (CMPE), Vientiane, Lao PDR
- Institute de Recherche pour le Développement (IRD) IRD-MIVEGEC, IRD UMR-MD3, Bangkok Thailand
- Kasetsart University, Department of Entomology, Bangkok, Thailand
- Institute de Médecine Tropicale d'Anvers (IMTA), Belgaum
- University of Life Sciences (ULS), Oslo, Norway
- Bureau of Vector Born Diseases (BVBD), Ministry of Health, Thailand

2- Risk of Vector-Borne Diseases in Relation to Rubber Plantations in Laos

3- Vector mapping, characterization of insecticide resistance of *Aedes* populations in Laos

- Evaluation of the levels of insecticide resistance in the vector populations in Lao PDR.
- Evaluation of the types and mechanisms of insecticide resistance in Laos.

- Evaluation in semi-field trials of common insecticide formulations used in Lao PDR versus candidate insecticides for larval control

Partners

- U.S. Naval Medical Research Center – Asia
- National Center of Malariology, Parasitology and Entomology (CMPE), Vientiane, Lao PDR

4- **Ticks and tick-borne diseases** in Laos

- Describe species composition and distribution of the ticks in the research area.
- Develop vector map for ticks and tick-borne diseases to provide information on the diseases surveillance and control.

5- Bionomic studies of sylvatic mosquito species as putative vectors of arboviral disease in primary forest in Lao PDR.

6- Economic development, ecosystem modifications, and merging infectious diseases risk evaluation" ecomore project risk of Vector-Borne disease in relation to rubber plantations in Lao PDR. (ECOMORE Project)

- Determine whether vector mosquito diversity and abundance differs in the different habitats
- Establish the relative proportion of mosquitoes infected with dengue, chikungunya and malaria
- Provide advice on how to decrease exposure of forest workers to vector-borne diseases

Lao – Lux lab / Vaccine preventable diseases Head of Laboratory: **Professor Claude MULLER**

Main objective of the lab:

The LaoLux Laboratory is operated by the Institute of Immunology in Luxembourg and aims to build capacity for investigations of important human and animal infectious diseases.

- Focusing on **vaccine-preventable infectious diseases**, zoonotic diseases,
- Identification of new viruses and variants and other investigations.

Project carried on in the lab:

- Mumps seroprevalence and molecular epidemiology
  - Department of Pathology, University of Health Sciences, Vientiane, Lao PDR. Luangprabang Provincial Hospital, Luangprabang, Lao PDR. WHO Lao Country Office, Vientiane, Lao PDR. National Center for Laboratory and Epidemiology, Vientiane, Lao PDR. Department of Pathology, Faculty of Medicine, Chiang

Mai University, Thailand. Public Health Laboratory Services Branch, Centre for Health Protection, Department of Health, Hong Kong SAR, China.

- **Hepatitis B virus**: a cross sectional serosurvey in different cohorts
    - Lao Red Cross, National Blood Transfusion Centre, Vientiane, Lao PDR. Department of Pathology, University of Health Sciences, Vientiane, Lao PDR. Department of Pathology, Faculty of Medicine, Chiang Mai University, Thailand.
- **Diphtheria seroprevalence** in Huaphan Province
    - Institut de la Francophonie pour la Médecine Tropicale. Laos-Japan Joint Laboratory for Parasitology, Institute Pasteur du Laos, Vientiane, Lao PDR.
- Serosurveillance of vaccine preventable diseases and **hepatitis C** in healthcare workers from Lao PDR
- Evaluation of **influenza virus** circulation and transmission in pigs and free ranging poultry from mixed farms in Lao PDR.
- Childhood respiratory infections in Lao PDR

Lao – Japan lab / Parasitology Head of Lab: **Shigeyuki KANO, MD, Ph D**

Main objective of the lab:

- Carry out research and training in the area of parasitology to better understand parasitic diseases affecting the Lao population and to propose ways to mitigate possible infections, and to provide technical support to the national level institutions in the area of malaria and other parasitic diseases.

Project carried on in the lab:

- Development of Innovative Research Technique in Genetic Epidemiology of Malaria and Other Parasitic Diseases in Lao PDR for Containment of Their Expanding Endemicity (SATREPS)
    - **Study period of the project**
        - Five years (May 2014 to April 2019)
    - **Study sites of the project**
        - **Malaria** (*P. falciparum, P. vivax*) + **Schistosomiases** (S. mekongi) + **Opisthorchiasis** (O. viverrini)
    - **Partners**

- Center for Malariology, Parasitology and Entomology (CMPE), Ministry of Health, Vientiane City, Lao PDR + NIOPH, Vientiane City, Lao PDR. National Center for Global Health and Medicine (NCGM), Tokyo, Japan + the University of Tokyo, Tokyo, Japan + University of the Ryukyus, Okinawa, Japan + Juntendo University School of Medicine, Tokyo, Japan + Tokyo Medical and Dental University, Tokyo, Japan

- Investigation of northern migration of Schistosoma Mekong in Lao People's Democratic Republic.

- International cooperation research concerning **water-borne diseases** in relocated people and the development of related risk management techniques.

Training / Teaching

- Intensive Training Course/Workshop on the Taxonomy and Identification of Mosquitoes, Ticks and Sandflies from Lao PDR- **Course Schedule**

- **Course Organizers**:

  - Dr. Pollie L.M. Rueda, Ph.D. Research Entomologist and WRBU Course Coordinator walter Reed biosystematics Unit (WRBU) Entomology Branch Walter Reed Army Institute of Research, Maryland 20910-7500 USA

  - Dr. Lt. Ian Sutherland, Ph.D. Research Entomologist Navy Medical Research Center-Asia PSA Singapore

  - Dr. Paul Brey, Ph.D. Research Entomologist Institute Pasteur of Laos Samenthai Rd. Lao PDR

  - Dr. Khamsing Vongphayloth, M.D. Research Entomologist Institute Pasteur of Laos Samenthai Rd. Vientiane, Lao PDR