

Research and development

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Background

The availability of serological tests remains a critical issue to face emerging arbovirus. In 2014, the A&EVD laboratory launched preliminary developments to set up MAC-ELISA tests that do not require highly specific reagents such as antibodies from hyper-immune ascetic fluids.

A first prototype for chikungunya virus IgM detection is now under validation through a multicentric study (Valoexpress MACH-2). Encouraging preliminary results led to apply the technology to new emerging arboviruses in Lao PDR. Using reference strains (Zika) or primary isolates obtained from fields specimens (phlebovirus), antigen were produced on a large scale to prepare prototypes for serological kits (IgM and IgG). Zika ELISAs will be validated in 2016 on a reference panel of sera provided by the Institut Pasteur de Nouvelle Calédonie. The phlebovirus tests have been utilized to rescreen a collection of sera collected in groups of the Lao population living in the geographic area from which the phlebovirus were isolated.



Chintana
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Marc Grandadam

Emerging viral diseases/Response to public health threats

In September 2015, the A&EVD laboratory was approached by the Lao Ministry of Health to reinforce the national laboratory capacity to face a possible outbreak of MERS-CoV. A procedure adapted from the Ebola alert system set up in 2014 was adopted. Methods were obtained with the collaboration of CIBU (Institut Pasteur, Paris) and validated by participation in an international proficiency test organized by the World Health Organization

Support activities

The A&EVD laboratory supported different Institutes within the Pasteur Network. Table 5 summarizes biological material transfers in 2015.

Biological material
Anti-Chikungunya virus IgM
Anti-Chikungunya virus IgM
Anti-Chikungunya virus IgM

Table 5:
Biological
material transfer
activity,
2014–2015

Education activities

+ Information on dengue surveillance and Rapid diagnostic tests: Attapeu Provincial Hospital, Saravanh Provincial Hospital (6 days, August 2015).

+ Dengue virus diagnosis: Training sessions for staff and students in Vientiane Capital Hospitals (Mitthapad; 5 April; Setthathirat; Children hospital; half a day per hospital).

+ Diagnostic de la dengue / infection à virus chikungunya: Institut de la Francophonie pour la Médecine Tropicale (1/2

day, Decembre 2015).

Training of students

	Degree	Institution	Time period	Subj
DNG	Lab technician	Epidemiology and Prevention centre of the Lao Army	May-July 2015	Dissemination of dengue virus
one SOU	Master 2	Institut de la Francophonie pour la médecine tropicale, Vientiane, Lao PDR	April-August 2015	Kindergarten
	Master 2	Institut de la Francophonie pour la médecine tropicale, Vientiane, Lao PDR	April-August 2015	Preclinical



Table 6:
Synthesis of
students welcomed
in 2015.

Students training

+ (Marc Grandadam) Member of the jury of thesis defense of doctorate: Anne-Claire ANDRIES. Phnom Penh, December 17th 2015.

+ Biosafety/Biosecurity course (Phase 1 in November 2014; phase 2 onsite visit to assess the capacity of the trainees to be trainers; June 2015).

Scientific communications

Poster:

Kouxiong SAYTENG; Malayvanh Lao; Souksakhone Viengphouthong; Paul T. Brey and Marc Grandadam First detection of Zika virus in Lao PDR. International Scientific Symposium – Institut Pasteur International Network. Paris, October 14th-16th, 2015.

Scientific articles:

1. Li MY, Grandadam M, Kwok K, Lagache T, Siu YL, Zhang JS, Sayteng K, Kudelko M, Qin CF, Olivo-Marin JC, Bruzzone R, Wang PG. KDEL Receptors Assist Dengue Virus Exit from the Endoplasmic Reticulum. Cell Rep. 2015 Mar 3. pii: S2211-1247(15)00167-9. doi: 10.1016/j.celrep. 2015.02.021.

2. Okabayashi T, Sasaki T, Masrinoul P, Chantawat N, Yoksan S,

Nitatpattana N, Chusri S, Morales Vargas RE, Grandadam M, Brey PT, Soegijanto S, Mulyantno KC, Churrotin S, Kotaki T, Faye O, Faye O, Sow A, Sall AA, Puiprom O, Chaichana P, Kurosu T, Kato S, Kosaka M, Ramasoota P, Ikuta K. Detection of chikungunya virus antigen by a novel rapid immunochromatographic test. J Clin Microbiol. 2015 Feb;53(2):382-8. doi: 10.1128/CM.02033-14. Epub 2014 Nov 19.

3. Vanessa M. Monteil, Marianne Maquart, Valérie Caro, Marie-Christine Jaffar-Bandjee, Marc Grandadam, Isabelle Leparco-Goffart. Circulation of Dengue virus type 3 genotype III in Africa since 2008. Submitted to Infection Genetics and Evolution.

4. Andrew J Taylor, Khamsing Vongphayloth, Malavanh Vongsouvath, Marc Grandadam, Paul T. Brey, Paul Newton, Ian W. Sutherland, Sabine Dittrich. Novel tick-borne bacterial pathogens in the Lao PDR – implications for human disease. Submitted to Emerging infectious Diseases.

Other documents:

+ Dengue virus surveillance in Vientiane Capital 2012-15. Trends and perspectives. Lao Ministry of Health. Department of Communicable Diseases Control. November 2015.

+ General security Manual of the Institut Pasteur du Laos