

(Abroad • Domestic) Internship report form (Student)

2024/05/16

Name	Emmanuel Kodua
Laboratory	Laboratory of animal experimentation
Year (Grade)	D3
Internship institution	Institut Pasteur du Laos
Internship period	Internship period: 04/02/2024 - 05/14/2024 (Departure Date from Sapporo: 04/01/2024, Arrival Date in Sapporo: 05/15/2024)
Purpose	To conduct internship activity at Institute Pasteur du Laos

- The reason why you chose this institute

My host and I met in South Korea in 2023 for the recently held international conference on hantaviruses. He found interest in my poster and upon a series of discussions we exchanged contacts for future collaboration. Virology and pathogen discovery laboratory conduct surveillance on pathogens of public health importance which incorporates activities of OneHealth in its daily work, such as surveillance of animals for zoonotic pathogens both emerging and re-emerging pathogens of public health importance. My host confirmed availability of recent epidemiological sample from bat, shrews and rodents so I suggested the possibility of working together through an internship program organized my university. Therefore, I saw this as an opportunity, that when utilized could serve as a basis for a long-term collaboration. Hence, I selected my host's institution for my internship. Also, Institut Pasteur is one of the recognized research institutions in the world and their research activities are in line with the activities of OneHealth.

- Result of the activity (about 800 words, provide photos, tables and figures that clearly show the activities during the period)

I began my activity on April 2, 2024. All activities went well with some adjustments in the initial schedule due to a week-long holiday during the Laos New Year festival. Hence, the Western blotting component of this activity as well as the sequencing of Polymerase Chain Reaction (PCR) positive samples could not be carried out. The first part of the program dealt with biosafety training on equipment and reagent handling, biological and waste control, and field sample handling such as pathogen inactivation. It included how to package biological samples for transport as well as sample sorting for epidemiological studies. Lastly, Facility tour

throughout the laboratories in the institute (April 2nd-5th).

The second part ushered in the screening of bat samples for hantaviruses using already prepared IFAT slides. A total of 376 samples were screened out of which 60 tested positive. 17 tested positive for both bat and shrew-borne antigens. 31 were positive to bat-borne antigens only while 12 tested positive to shrew-borne antigens only. These were done between April 8th and May 9th of which April 13th-18th were holidays as well and May 1st was a national holiday. Out of the 60 positive samples, the cDNA of 38 were selected for genomic detection using Polymerase Chain Reaction (PCR) with Panhanta primers:

PanHanta-F2: 5'TGCWGATGCIACRAAATGGTC3'

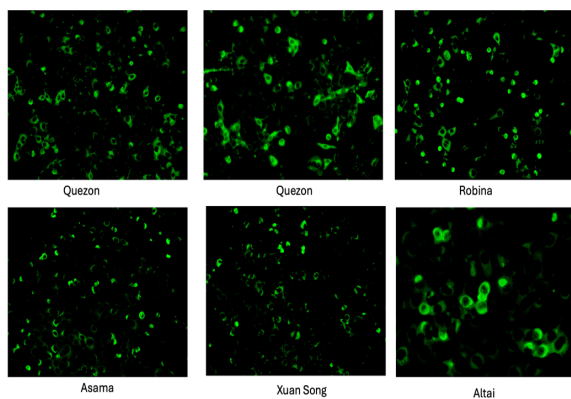
PanHanta-F1: 5'ATGTATGTIAGTGCWGATGC3'

PanHanta-R1: 5'ACCAITCWGWICCATCAYC3'

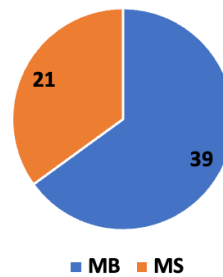
PanHanta-R2: 5'GCATCATCWGARTGATGIGCAA3'.

Out of the 38 tested, 6 of them were PCR positive (May 10th to 12th). Sequencing of the PCR-positive amplicons was scheduled to be done after my training on 14th May. May 13th was used for data processing to prepare the final report for an institutional seminar held on May 14th.

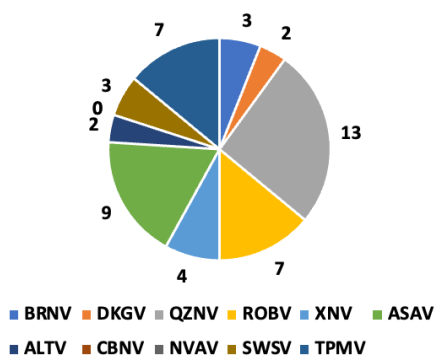
Excepts from IFAT results



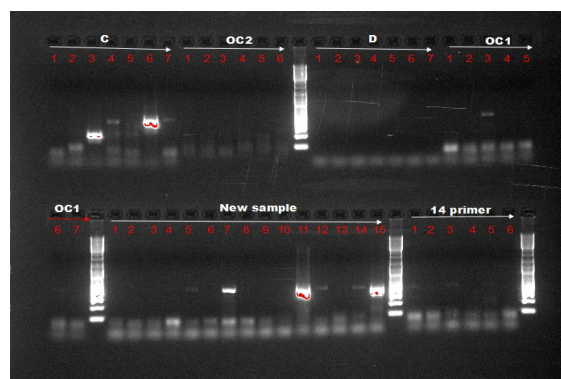
Distribution Co-transfected antigens

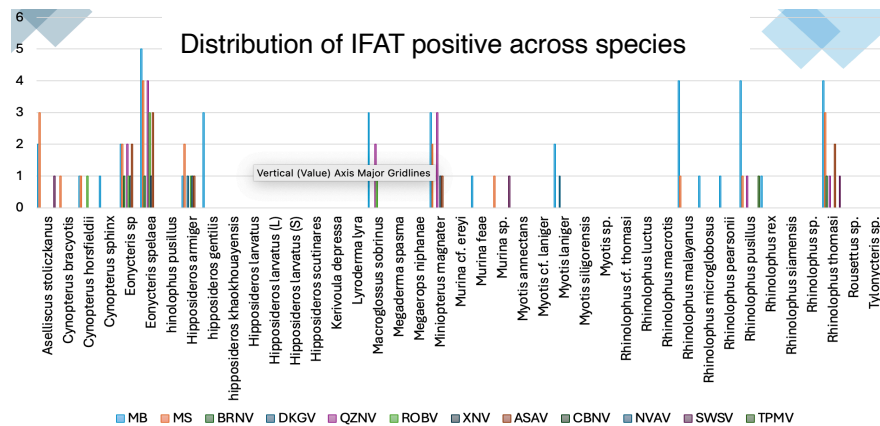


Distribution of Individual Antigens



PCR output





What do you think the positive impact of the activity will have on your further career path?

Career path

The activities were carefully designed to advance me in serological diagnostics and molecular detection of pathogens of animal and human importance. Considering my intention to develop myself in pathogen detection, diagnostic and therapeutic, this self-organized activity has given me the necessary connection for future collaborations. Secondly, based on the positive outcome of the activity, we intend to develop a long-term collaboration with our collaborators in Laos PDR while we expand the existing Memorandum of Understanding (MoU) in the future.

Tentatively, In the next ten years, I intend to establish myself in the development of diagnostic as well as therapeutics to augment the medical needs in my home country which might also benefit the world at large through novel discoveries. Hantaviruses are currently found to circulate within EuroAsia and the American continent with almost no data from the continent of Africa. Therefore, my research will focus on the detection of hantaviruses in both humans and animals in Ghana. Hence, the serological tool development will provide me with the necessary platform for hantavirus epidemiology in Ghana which will be extended to other African countries. My collaborative program with Institut Pasteur du Laos will serve as a platform for knowledge and skill sharing in viral pathogen discovery.

- Advice for your junior fellows

My advice is that effective collaboration is a valuable tool for understanding infectious diseases as well as the easiest way to have your dream realized as a young scientist.

Approval of supervisor	Institution · Official title · Name Institute for Genetic Medicine, Associate Professor, 吉松 梢子
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- ※1 Send the electronic file to the WISE Program Office
- ※2 Attach a copy certificate of the content of internship activity that is prepared by the counterpart at the internship institution (any form with a signature of the counterpart).
- ※3 The Steering Committee for the WISE Program will first confirm the content of this report and report will be forwarded to the Educational Affairs Committee for credits evaluation.