This report should be submitted within 2 weeks after you return to Japan.

（Abroad・Domestic）Internship report form（Student） 2019/03/04

(Year/Month/Day)

Name	Balapuwaduge Charitha Gayathri Mendis
Laboratory	Division of Bioresources, Research Center for Zoonosis Control
Year (Grade)	D4
Internship institution	National Tuberculosis Reference Laboratory (NTRL), Welisara, Ragama, Sri Lanka
Internship period	Internship period : 01/07/2019 - 01/27/2019 (3 weeks) (Departure Date from Sapporo: 01/05/2019, Arrival Date in Sapporo: 02/18/2019)
Purpose	Abroad internship

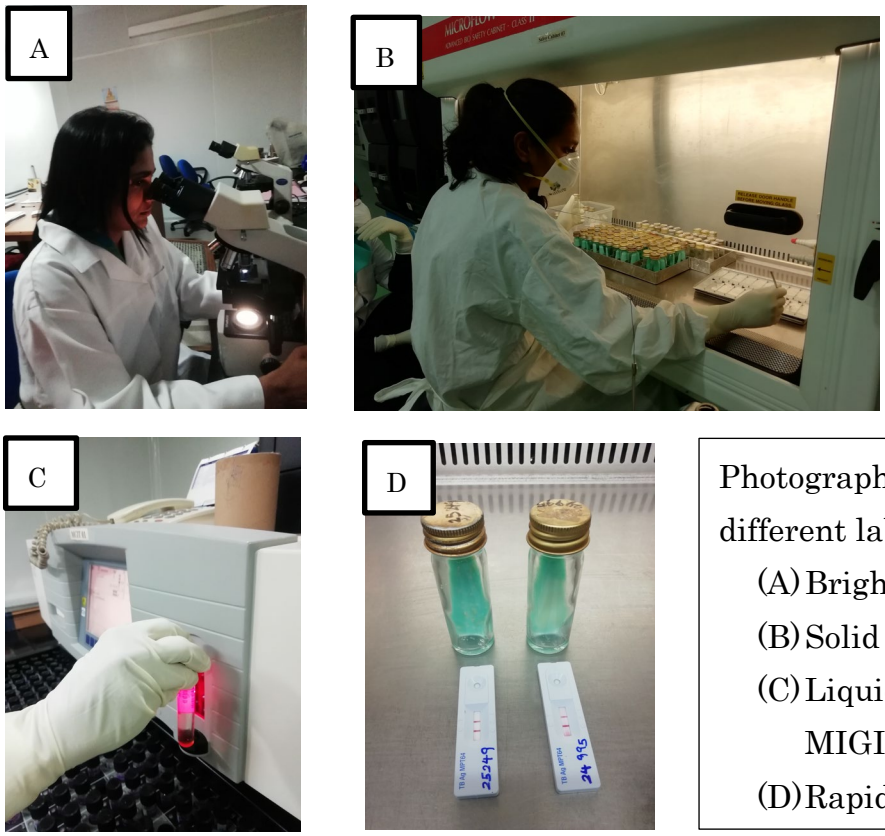
- The reason why you chose this institute

National Tuberculosis Reference Laboratory (NTRL) is the central level laboratory functioning under administrative purview of National Programme of Tuberculosis Control and Chest Diseases (NPTCCD) in Sri Lanka. This is the only laboratory in Sri Lanka which has the BSL 3 facility. The drug susceptibility testing for *Mycobacterium tuberculosis* isolates is done only in here. NTRL is also responsible for coordination of tuberculosis (TB) laboratory network (4 culture laboratories, 26 district chest clinic laboratories and 157 functioning microscopy centers), formulation of laboratory policies, and guide lines, establish standard techniques to use in the network and provision of technical guidance to the network laboratories. Therefore, I wanted to learn about the role of NTRL and make network with them for future research collaboration.

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

In summary during my training in NTRL, Sri Lanka, I was able to get exposure to the routine diagnostic procedures that are carried out by NTRL, learn about the procedures of conducting quality assurance of sputum smear microscopy to detect mycobacteria in the national laboratory network and discuss about procedure of participating in external quality assurance conducted by Supra Reference Laboratory. In addition, we discussed about the areas where we need research to improve the laboratory diagnosis of tuberculosis and also I got a job offer.

As there were several main laboratory testing procedures for me to learn, I made a working schedule after discussing with Dr. D. Jayawardana, consultant microbiologist in NTRL in advance. All the procedures were performed under the supervision of a technical officer (Photograph 1). I observed and performed the sputum smear microscopy. I prepared the sputum smears and performed two staining techniques: Ziehl – Neelsen staining method for bright field microscopy and Auramine staining method for fluorescent microscopy (light emitting diode based). Lowenstein- Jensen (LJ) medium for culture and drug susceptibility testing were prepared. I observed and performed the procedures (sample preparation, inoculation to media, incubation, interpretation and reporting) of isolation of *M. tuberculosis* by NaOH method by modified Petroff's procedure (solid culture), BACTEC MIGIT 960 system (liquid culture) and identification of *M. tuberculosis* by a rapid test called SD BIOLINE TB Ag MPT64. I observed the procedures of drug susceptibility testing on LJ medium by standard economic variant of 1% proportion method (indirect drug susceptibility method) and Xpert MTB/RIF assay for rapid detection of *M. tuberculosis* and rifampicin resistance.



Photograph 1. Performing different laboratory procedures
(A) Bright field microscopy
(B) Solid culture
(C) Liquid culture- BACTEC MIGIT 960 System
(D) Rapid test - SD BIOLINE

NTRL conducts the quality assurance programme for sputum smear microscopy for 26 district chest clinics in Sri Lanka and participates in proficiency

testing of sputum smear microscopy conducted by SAARC tuberculosis and HIV/AIDS Centre in India. For quality assurance of drug susceptibility testing, NTRL gets panel of live isolates from Prince Leopold Institute of Tropical Medicine in Belgium (a TB Supranational Reference Laboratory). I learnt about those quality assurance procedures as well. I was able to be familiarized with their internal quality control programme and also the procedure in obtaining accreditation under ISO 15189.

I had fruitful discussions with consultant microbiologist (Photograph 2) in NTRL time to time. I also got some research questions based on the observations of technical staff members and microscopists. We identified many gaps where we need to fill through research. Three main areas are molecular epidemiology of drug resistance *M. tuberculosis* strains circulating in Sri Lanka, transmission dynamics of TB and infections in humans due to non-tuberculous mycobacteria. Processing of documents to obtain permission from the Ministry of Health for the collaborative project (between NTRL and CZC, Hokkaido University) on "Molecular characterization of *Mycobacterium Tuberculosis* clinical isolates collected from retreatment patients with pulmonary tuberculosis in Sri Lanka" was initiated.

They are going to recruit a person to NTRL for the new post of research officer. They invited me to join with them. But I had to refuse it humbly as I already have a position as a lecturer in University of Peradeniya.

Photograph 2. Consultant Microbiologist, Dr. Dushani Jayawardhana in NTRL (left)

Furthermore, on the first day before starting my training at NTRL and the last day I met Dr. Refai, Director of NPTCCD (Photograph 3), Sri Lanka as a formality and to inform him the initiation and completion of my internship. It was a good opportunity for me to introduce my field of study and share the opinions on epidemiology of tuberculosis with Director, NPTCCD, Sri Lanka whom will be important in my future research collaboration. He invited to carry out research on non-tuberculous mycobacteria and animal TB after going back to Sri Lanka.

Photograph 3. Director, NPTCCD (left) and Coordinating Officer for NTRL in NPTCCD (right)

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

My current research area is molecular epidemiology of TB in Sri Lanka, therefore my findings will provide background information to strengthen the diagnostic service and TB control strategies in Sri Lanka. As I was able to make a connection with NTRL and NPTCCD and they got to know about my work and myself, it will be helpful for me to disseminate my research findings to the relevant authorities. I got experiences in the laboratory procedures, activities, and services provided by NTRL, and it also helped me to identify the gaps where we really need research specially in epidemiology and development/ introduction of new diagnostics. As I already have a position as a lecturer in University of Peradeniya, Sri Lanka, I will continue my career in academia and research. By networking with them it provided opportunity to continue collaborative research. I hope it will also useful for me to achieve my dream of establishing a research

center for tuberculosis in University of Peradeniya to conduct research on human, animal and zoonotic TB and also to provide diagnostic service when it is necessary.

- **Advice for your junior fellows**

- Start preparation for the internship in advance and be aware about the changes in rules and regulations relating to the selected institute.
- If possible, try to select an institute in a foreign country as it will give you an opportunity to experience a different working culture and also to make connection with another group of scientists/ people who work on your field of interest.
- Think about your future direction and select a suitable institute.
- Communicate with people in all levels of hierarchy in the institute. You will learn something and will get more facts that some could be eye opener

Approval of supervisor	Institution・Official title・Name

※1 Send the electronic file to the Leading School section, International Affairs 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 of the Leading Program will first confirm the content of this report and report will be forwarded to the Educational Affairs Committee for credits evaluation.

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