

This report should be submitted within 2 weeks after you return to Japan. Please do not change the formatting

Abroad Domestic) Internship report form (Student)

2019/11/15

Name	Ochbayar Erdemsurakh
Laboratory	Laboratory of Comparative Pathology, Department of Clinical Sciences, Faculty of Veterinary Medicine, Hokkaido University
Year (Grade)	DC4 student
Internship institution	Emerging Pathogens Institute, University of Florida
Internship period	Internship period: 19/10/2019 - 01/11/2019 (Departure Date from Sapporo: 10/19/2019, Arrival Date in Sapporo: 11/01/2019)
Purpose	The goal of this internship was (1) to acquire knowledge and skills necessary to do comparative genomics analyses with the published genomes of <i>Burkholderia mallei</i> ; (2) to establish professional relationship with other researchers who are studying <i>Burkholderia</i> species (3) to find new ideas for my future career path research.

- The reason why you chose this institute

I am currently studying glanders, specifically the pathological changes of naturally occurring equine cases in Mongolia. I chose this institute which is located in United States because Emerging Pathogens Institute in the University of Florida has investigated the genotype classification of *Burkholderia pseudomallei*, a close relative of *B. mallei*. This institute also aims to understand how genetic changes and emergence of new pathogens cause other *Burkholderia* spp. disease. Also, I heard that this institute has potential exchange and training program that give a good opportunity to meet new researcher from other part of the world. Studying with researchers who are at head of field of *Burkholderia* spp has helped open my mind in a broader spectrum, not only in the pathology points of view but also related fields of study. Moreover, the laboratory members gave constructive comments and recommendations for my future career research. Moreover, Dr. Apichai is still much interested in studying its pathogenesis and vaccines. He has recently published a vaccine paper for glanders made from outer membrane vesicles of non-pathogenic *Burkholderia thailandensis* <https://www.ncbi.nlm.nih.gov/pubmed/29320408>. Also, he has developing phage therapy for both melioidosis and glanders.

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

During the internship I planned to learn how to analyze the whole genome sequence of

Burkholderia mallei and to compare the genome information with the previously reported sequences. These techniques are very useful for analyzing *B. mallei* isolated in Mongolia. My internship included hands-on training on the following subjects:

1. Basic bioinformatics for microbiologists (Genome viewer: Artemis, Genome editing: Bioedit, Genomic comparison: Artemic Comparison Tools (ACT)).
2. Genomic assembly (used by Galaxy, a web-based framework for accessible, reproducible, and transparent biological computing (FASTQ Groomer; BWA-MEM, Genome mapping and SNPs analysis; SPAdes genome assembler for regular and single-cell projects)
3. Used of Patric, the pathosystems resource integration center (Assembly, annotation, proteome comparison (Fig. 1), variation analysis).

I participated in a poster presentation (Fig. 2) about graduate students on 22 October 2019

I attended a poster presentation of graduate students (Fig. 2) and I met with young researchers. Dr. Apichai showed me about in vivo experimental animals results of histopathological and immunohistochemical changes (Fig. 3) then we discussed about the result of similar or different of *Burkholderia mallei*. Dr. Apichai ordered food (pizza and sandwiches) for he has a group meeting on Friday. Before the meeting was started, we ate together for lunch in the common area on the 4th floor. After lunch I presented my research work then we discussed the more detailed current situation of *B. mallei* in Mongolia and future study/career path. Also, his students presented *B. pseudomallei* (Fig. 4). Dr. Apichai introduced me the city of Gainesville and we went to some nice place then took photos (Fig. 5).

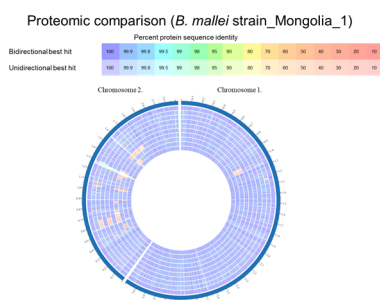


Figure 1. Proteomic comparison results



Figure 2. Poster presentation of graduate student's



Figure 3. We discussed by histopathological and Immunohistochemical results for *B. pseudomallei*.

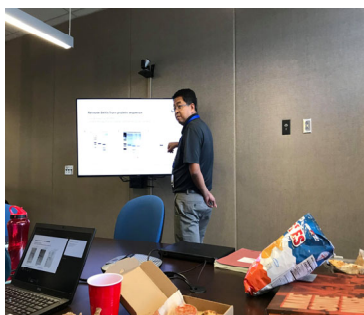


Figure 4. Dr. Apichai Lab graduate project meeting and discussion



Figure 5. He introduced to me about the city of Gainesville.

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

This internship increased my knowledge in my chosen field. I did my internship in one of the best laboratories focused on pathogens, especially *Burkholderia pseudomallei*, as close relative of *B. mallei*. During my internship, I used rough genome sequence data of Mongolian *B. mallei* isolates and compared with other published strain. The genomic field in Mongolian veterinary medicine is not yet established compared to the that of other countries. So, I will be able to write a genome announcement paper based in part on the results of this internship. Moreover, I believe, he might be interested in collaborating with us in future.

- Advice for your junior fellows

You should write the application form very carefully and in an easy-to-understand manner according to the requirements. In particular, it seems to be rejected if the relationship with career path is not carefully written. You should clearly think about your goals for internship and find the place that match with yours. The strong connection with the institute where you will visit must be helpful to arrange your trip well. Start a communication with your supervisor as early as possible. Prepare documents (visa, insurance, flight tickets, housing facilities, etc) few months prior to your departure. You should know about the area, culture and food in detail. Visit relevant facilities and people as many as possible, because getting to know each other is important for future collaborations. If you have an opportunity to attend a conference or seminar, you should make a network of connection. I recommend an internship as long as possible.

Approval of supervisor	Institution • Official title • Name
	Dr. Apichai, Tuanyok
	Emerging Pathogens Institute, University of Florida

※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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