(Abroad) Domestic) Official trip report form (Student) 2016/06/20 (Year/Month/Day)

Name	Yogendra SHAH
Laboratory	Division of Bioresources, Research Center for Zoonosis Control
Year (Grade)	D3
Destination	Fort Collins, Colorado, USA (Colorado Mycobacteria Conference)
Period of trip	June 7 to 10 June , 2016
Purpose of trip	I attend the Colorado Mycobacteria Conference 2016 and present a poster entitled "High diversity of *Mycobacterium tuberculosis* Central Asian strain family isolates in Nepalese patients". The conference mainly focuses on advances in the genomics, genetics, infection control and clinical aspects of mycobacterial diseases including human tuberculosis, leprosy, Buruli ulcer, non-tuberculous mycobacterial infections, bovine tuberculosis and Johne's disease.

Summary of activities about 800 words, provide photos, tables and figures that clearly show the activities during the period)

I arrived Colorado, Fort Collins (USA) on June 6, 2016. From June 7, I attended the Colorado Mycobacteria Conference 2016 at the Colorado State University center for Arts, Fort Collins, Colorado. The conference main theme is an integrated approach to mycobacterial research, which reflects the changing landscape of global public health and zoonoses. For four days, conference was also mainly focused those researchers, scientists and students who are working especially on field of mycobacterial diseases and provide the platform to discuss, debate and network colleagues, strengthening their commitments to global efforts to improve lung health in humans and animals. On the opening day two keynote lectures were delivered by Dr. Warwick Britton, Bosch Professor of Immunology Medicine, University of Sydney about "TB and Leprosy research: Then and Now" and Dr. Gilla Kaplan, Director, Tuberculosis Programs, Bill and Melinda Gates Foundation, Seattle, WA, lecture on "Filling the gaps: The BMGF approach to TB research and development".

The second day, June 8, was started with three main topics on Biochemistry, Physiology and drug development consists of two sessions including (oral and poster presentations) at University theatre, University center for the arts. The morning sessions were mainly focused on oral presentations including the biosynthesis pathway of lipid metabolism, physiology and novel drug findings as well as search of new potential drug for treatment of mycobacterial diseases like *Mycobacterium tuberculosis*, non-tuberculosis. The afternoon session was started from 3:00-5:00 pm which focused on poster presentations composed of total 65 posters related to mycobacterial diseases at instrument rehearsal hall, University center for arts. I presented my poster at poster No.0016 entitled "High diversity of *Mycobacterium tuberculosis* Central Asian strain family isolates in Nepalese patients". I got the suggestion and recommendation from the visitors to improve my research study. They also asked me the way of implementation for control and prevention of TB in Nepal. I tried my best to explain the questions more understandable way to visitors. I attended the both presentations were delivered covering on different themes by top class professors and researchers as follows.

- Mycobacterial Metabolism: chemical biology at the intersection of pathogen biology and drug development
- Potentiating the anti-tubercular action of antifolate drugs
- In search of a new generation of bedaquiline
- Genomics, structural biology and discovery of new antimicrobials: recent developments with *M. tuberculosis* and *M. abscessus*.
- Antibacterial bactericidal activity is countered by maintain pH homeostasis.
- The development of type II NADH dehydrogenase inhibitors as anti-tuberculosis drugs
- Harnessing mycobacterial ingenuity of cell reprogramming: new insights into pathogenesis and tissue repair.

The third day of the conference, June 9, was started with multiple topics on Immunology, immunopathology and host-pathogen interaction also consists of two sessions at University theatre, University center for the arts. The morning oral presentations were mainly focused on immunological functions and

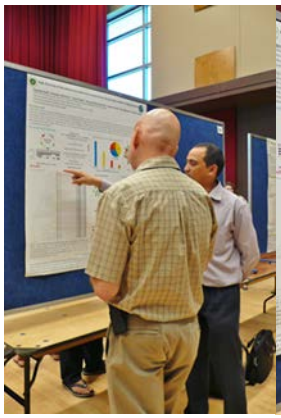
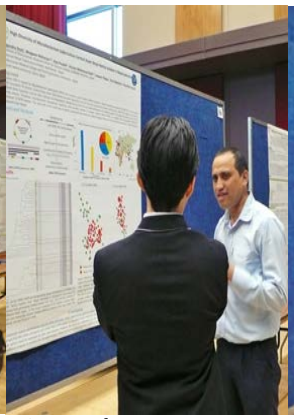
immune responses applying in Guinea pig model, pathological related to mycobacterial diseases and host-interaction of mycobacterial diseases. The afternoon session was started from 3:00-5:00 pm as previous day at instrument rehearsal hall, University center for arts. I presented my poster at poster No.0016 entitled "High diversity of *Mycobacterium tuberculosis* Central Asian strain family isolates in Nepalese patients". I got the questions from the visitors about the implementation of molecular epidemiology study and how can control the MDR-TB situation among the CAS family in Nepal by applying my recent study. I tried my best to explain the questions more understandable way to visitors. I attended the both lectures were delivered covering on different themes by renowned professors and researchers as follows.

- The role of human gamma9/delta t cells in TB immunity
- BCG
- Early immune responses in the guinea pig model of diabetes-tuberculosis comorbidity
- Nicotine impairs macrophage control of *Mycobacterium tuberculosis* by binding to nicotine acetylcholine receptor, activating NF-kappaB and inhibiting autophagy.
- A dominant-negative mutation in TNFR1 results in increased susceptibility to pulmonary tuberculosis infection
- Preclinical studies of aerosolized host directed therapy for TB treatment.
- Linking research to the End TB strategy-will we get there by 2035?

The last day, June 10, was started with three main topics on Epidemiology, Diagnostics and Biomarkers consists of only one session's i.e oral presentations at University theatre, university center for the arts. The morning sessions were mainly focused on oral presentations covering information on epidemiology features on mycobacterial diseases i.e *Mycobacterium tuberculosis*, *Mycobacterium bovis* and non-tuberculosis, novel findings on discovery of diagnostics/biomarkers method for TB treatment and describes about the combination of both genotyping and bioinformatics tools important to predicting the cattle movement networks, genomic computational and epidemiological approaches. I attended the oral presentations were delivered covering on different themes by professors and researchers as follows.

- How close are we to bio-marker-driven interventions in TB?
- A novel polyamine catabolite identified as a urine biomarker of TB treatment response
- US cattle TB eradication program: where is *Mycobacterium bovis* coming from now?
- Changing the epidemiologic paradigm at the human animal interface: using whole genome sequencing to track *Mycobacterium bovis* infection across species
- Predicting cattle movements networks: *Mycobacterium bovis* spatial-genotyping versus gravity modelling
- Non tuberculous mycobacteria impacting individuals with or without cystic fibrosis: genomic, computational and epidemiologic approaches
- Diagnosis and treatment of NTM infection in cystic fibrosis

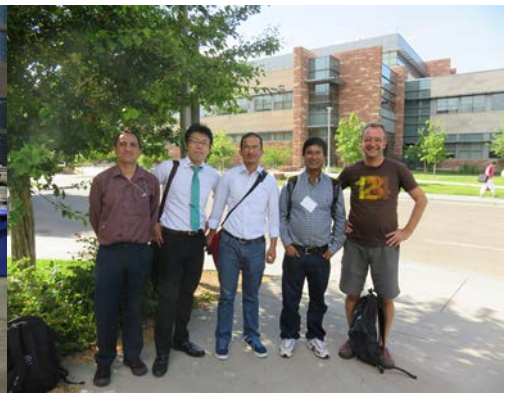
Finally, I returned back to Japan from Colorado on June 11 and arrived on night of June 12. I found this mycobacterial conference 2016 was very informative and important to know about the different molecular genotyping tools, bioinformatics analysis, key concepts in mycobacterial diseases based on biosynthesis mechanism as well as physiology, novel approaches of disease diagnosis, one health concept and also support the students in developing the research as well as career plan. I would like to sincerely thank to leading office and Research Center for Zoonosis control especially Prof. Motohiro Horiuchi, Yuki Maki San, Prof. Yasuhiko Suzuki, Prof. Chie Nakajima sensei, Yuko Hidaka San and Colorado State University for helping me to attend this conference and sincerely look forward to getting the opportunities in the future.

Poster presentation at conference

Photo with Prof Gyanu Lamichhane

Photo with chairperson Prof Crick Dean



Hokkaido, CSU and Auckland University

Approval of supervisor	Institution・Official title・Name： Hokkaido University Research Center for Zoonosis Control Professor Yasuhiko SUZUKI　印

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