

## Student Free Design Activities (One Health on-site Training)

### 報告書 Report

#### 報告者 [Reporter]

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#### 活動報告 [Activity Report]

※活動内容が判る様な写真や図表を加えて下さい。 / Provide photos, tables and figures that clearly show the activities during the period.

タイトル [Course Title]	Exploration of the Translational Medicine Institute and Veterinary Teaching Hospital of Colorado State University (CSU) as well as participation of the American College of Veterinary Internal Medicine (ACVIM) Forum 2022
実施期間 [Periods]	CSU: 2022/6/19 ~ 2022/6/21 ACVIM: 2022/6/22 ~ 2022/6/26
共同実施者 [Other participants]	【Academicians】 Mitsuyoshi Takiguchi, Junpei Yamazaki, Keitaro Moshita
言語 [Language]	English
実施場所 [Location]	Colorado State University, Fort Collins, Colorado, USA Austin Convention Center, Austin, Texas, USA

#### 申請時計画の実施報告 [Report how you carried out your plan in the application form]

##### 1) Preamble Preparation:

For the visit to CSU, we have contacted the Chief Medical Research Officer of the Translational Medicine Institute (TMI), Dr Heather Pidcoke and Associate Dean of Research of the College of Veterinary Medicine and Biomedical Sciences, Dr Mark Zabel to discuss on the possible activities and training to be partaken in CSU. As all three of us are clinicians by training, our associates in CSU have suggested that we should pay a visit to the TMI to experience the collaborative efforts between human and veterinary medicine and the veterinary teaching hospital (VTH) to dive into the efforts made by CSU in championing well-being in both human and animals. For ACVIM participation, due to novelty conflict of interest in my primary research I was there as a participant only. Presentations and keynote lectures which were related to One Health or translational medicine were selected as primary lectures.



Fig. 1: The areas and institutes visited A: TMI in CSU, B: VTH in CSU, C: 2022 ACVIM in Austin, Texas.

2) CSU TMI and VTH visit: The visit to TMI and VTH has opened our eyes on the scale of technology and resources which donors in the States are willing to invest for the betterment of future patients and research. The TMI was funded by the Malones family to support equine medicine with collaboration with human orthopedics medicine under the leadership of Dr C. Wayne McIlwraith. One of the aims is to foster speedy clinical trials which can be used on both horses and humans. The TMI has a dedicated lab to run the basic science research, working closely with the veterinarians and doctors to collect samples and delivery novel treatment option, hence sealing the translational medicine flow from lab bench to clinics. While both institutes seemed to be separated by their names, in physical and functionality both institutes are interconnected, where the veterinary diagnostic laboratory is situated on the ground floor of the TMI, running tests for the VTH. Although we had the opportunity to visit the VTH, as it was a public holiday, there were no cases in the hospital for us to see or follow. Instead, we had a tour around the VTH to understand the available units and facilities such as the Flint Animal Cancer Center, Johnson Family Equine Hospital, interventional radiology unit and so much more.

We were introduced to several cutting-edge learning tools such as the 4-D lecture suite and VR anatomy lab, as well as sophisticated research technologies such as the standing MRI for horses and the audio-visual studio which drives a higher level of training and continuous professional development for both doctors and veterinarians. The VR anatomy lab was intriguing as the system allows the study of both human and animal anatomy, for which comparative anatomy can be studied without using cadavers or dead animals. This system reduces the necessities in using organic samples which can be wasteful, at the same time provide learning opportunities 24/7 as students can access the lab any time.

### 3) ACVIM 2022 Forum:

Despite the forum covers mostly topics in small animal medicine in general, topics where pathogenesis and treatment inspired by human medicine were also available. An example would be the lecture of "The pathogenesis and management of gall bladder mucocele in dogs", where cystic fibrosis transmembrane receptor (CFTR) dysfunction in dogs with such disease had similar patterns with the lung secretion of humans with cystic fibrosis. Further investigation on the pathogenesis of this disease may find a viable treatment option to lead clinical trials in dogs, which may be translated into human use for patients with cystic fibrosis, putting the concept of One Health at a good use. Participation in lectures like these has allowed the learning of novel research methodologies to bridge human and veterinary medicine in novel diseases. I have also taken the initiative to discuss with the speaker, Professor Jody Gookin about other methodologies that her team may try to discover more susceptible genes, such as SNP array. As our research outline is very similar, I had a very fruitful discussion with her about both of our research topics.



Fig. 2: Various facilities in the TMI. A: The TMI outlook, B: The Veterinary Diagnostic Laboratory Office, C: The donors of TMI, D: A horse prepped for surgery in one of the surgical suites.



Fig. 3: State of the art research tools in TMI. A: 4-D lecture suite, B: VR Anatomy Lab, C: Standing MRI for horses, D: Audio-visual production studio.

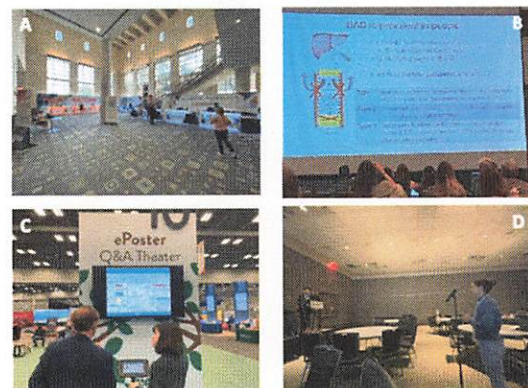


Fig. 4: Multiple activities in ACVIM 2022. A: ACVIM Reception, B: Lecture on bile associated diarrhea, C: E-poster presentation by a fellow graduate student, D: Q&A session in an oral presentation.

目的達成状況報告 [Report how you achieved your goal/objectives listed in the application form]
<p>1) During the visit to CSU, we have managed to experience the top-notch facilities and true meaning of translational medicine, where basic science meets clinical science hand in hand to promote healthcare in both animals and human. We have also managed to meet the first batch of PhD students in translational medicine of TMI and discussed about our research and made connections. Unfortunately, due to the holiday on the 20<sup>th</sup> June, we were not able to experience the VTH at its full capacity where cases were seen in the day.</p> <p>2) Participation in ACVIM forum have allowed us to see the frontiers in clinicogenomic studies which eloquently applied knowledge learned from human medicine to be applied in veterinary medicine, especially in pursuit for pathogenesis and treatment options.</p>
One Health Approach実践報告 [Report how your activity could link to One Health Approach]
<p>Did you have a chance to experience One Health approach (collaboration with people from other academic areas)? Please describe some of the examples of One Health approach you implemented in your activity. Otherwise, explain the possibility(ies) how you could link this activity to One Health approach for your future.</p> <p>As the TMI is still at its beginning stages of pushing boundaries in translational medicine, its current capacity remains at collaborative efforts between equine and human medicine for orthopedic patients. However, with the recruitment of its first batch of PhD students in translational medicine, it can be foreseen that the institute will be leading more research which benefits both humans and animals. In the future, collaborations can be made with these students and their affiliated laboratories to engage in studies which translates basic sciences to clinical trials such as regenerative medicine, prion-related zoonotic diseases and human-animal bond psychology or psychiatry studies.</p> <p>For ACVIM, discussing with the faculties who have had their research inspired by disease in human studies have shown to be fruitful, as companion animals share environment with humans. While no definitive collaborative studies have been discussed, it is thought to be possible for future partnership to happen between human and veterinary medicine in Japan as well, since our colleagues in America are able to do so too. This is especially true for gastrointestinal diseases, as manifestation of inflammatory bowel diseases are similar between human and dogs, such as bile associated diarrhea due to dysregulation of gut microbiome and amino acid, which are both regulated by diet.</p>
備考 [Remarks]
<p>This visit to CSU-TMI, CSU-VTH and ACVIM has broaden the perspective towards common application of human medicine in veterinary medicine and vice versa. Despite being at the frontier of veterinary medicine, our American colleagues too have presented challenges in the true practice of translational medicine. While the progress towards application of One Health in companion animal medicine is still slow, current practices such as human-animal bond, stem cell directed regenerative medicine, dog as animal model for human cancer and so much more has proven that One Health is improving. Seeing how CSU is pushing boundaries in One Health has inspired me to think more about zoonotic diseases, and I hope to see both veterinarians and human doctors are willing to work more closely to strive towards the goal of One Health.</p>

※ 報告書を作成後、担当教員に確認をお願いし署名をもらってください。PDFファイルとしてVetLog上の提出書類「Student Free Design Activities報告書」としてアップロードして下さい。

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