

One World–One Health の実現に向けて
1つの世界、1つの健康

News Letter

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北海道大学博士課程教育リーディングプログラム
One Healthに貢献する
獣医科学グローバルリーダー育成プログラム



One World–One Health
1つの世界、1つの健康

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The 2nd One Health Debate

Date September 6, 2017

On September 6th, these two teams met to debate the proposition:
Public awareness is the key for prevention of antimicrobial resistance.

This event was a spotlight for students to engage each other on one of the most pressing global health threats: What is the best way to prevent bacteria and other dangerous microbes from avoiding our therapeutic defenses?



VS

The Pro team argued that all sectors of society need to know the details about how antibiotics can be either utilized for good, or abused out of ignorance. If individuals don't understand the dangers to society, then legislation won't be effective because people will ignore the rules.

The Con team argued that knowledge itself is no solution, only a part of the solution which should instead focus on enacting and enforcing laws because most countries have no regulations established. International bodies such as the WHO should work more with low-income countries that require organizational support.

This debate required active participation from audience members as well. As they walked in the room, they voted their position on the proposition before the debaters spoke. When all the arguments from both teams were finished, the audience voted again. The side to which more people switched their opinion was the winning team.

BEFORE THE DEBATE			
Agree	Neutral/Undecided	Disagree	total
19	6	4	29
AFTER THE DEBATE			
Agree	Neutral/Undecided	Disagree	total
10	6	13	29
NET CHANGE			
Agree	Neutral/Undecided	Disagree	total
-9	0	9	0

Before the debate began, most people agreed that public awareness was the key to fight AMR. After hearing the arguments that more is needed, a net total of 9 people changed their opinion that other measures are more important.



A member of the Con team presents her case that spreading knowledge is not sufficient to effectively fight antimicrobial resistance (AMR). She cited the example of the European Union's successful legislation banning antibiotics as growth promoters.



After three rounds of exchange between the teams, there were 20 minutes of questions from students in the audience. Tough questions were asked of both teams, and it was a also good chance for questioners to be seen by professors in a new light.



The One Health Debate is a student-centered learning activity that showcases the skills of logical argumentation, public speaking, and scientific problem solving. Students

wrote the proposition, did their own research, and collaborated with each other on their own time. While they reported being quite nervous before we started, there were no pauses or

slow parts in this lively debate. The debaters have good reason to be proud of their effort, and this should serve as a nice confidence boost.

The 4th Global Leaders Workshop

Date July 27, 2017

For almost three hours, first-year PhD students (plus a handful of others) convened to address One Health issues. The 29 students were distributed evenly into 6 groups. The aim of the workshop was to develop in students the skills befitting global science leaders in an all-English international setting.

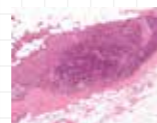
Building on previous experience

Past workshops had asked to all groups a single question such as "What are the essential elements needed for a person to be a global leader?" While the process was smooth, the final presentations from each group sounded quite similar.

To drive this 4th workshop towards more productive presentations, we asked 3 questions to produce more variety. Two committee members created a shortlist of 2 issues per category, and after having 8 senior PhD students vote on their favorites, the topics emerged:



Infectious Disease
In what way can we most effectively combat vectors of dengue?



Comparative Medicine
Identifying best research targets for common tumors in both humans and animals



Environmental Science
What animal would be the best to bring back from extinction?

Organization

Two weeks before the event, students selected their topic and were then given a study guide with key terms.

The event started with an initial round of reading and answering comprehension questions in mixed groups. In Round 2, each group of 4 or 5 people constructed an evidence-based plan. They drew a poster that was then projected on screen while they

presented their policy in 5 minutes. The winner was determined by the vote of an audience of peers, senior students and faculty, numbering 55.

Event schedule		
Round 1	40 min	analyze background information
Round 2	100 min	discuss policy solutions
Final Round	60 min	deliver 5-min presentation

Learning outcomes

Academically, students were challenged to contribute their individual expertise towards constructing policy on hot topics in global health entirely in English. Socially, new connections were made across the student body, half of which is non-Japanese. And personally, shy students were given the chance to overcome their fear of public speaking by performing with group support.

The Global Leaders Workshop had a little bit for everyone: the audience gathered informed opinions on three different topics, supervisors witness their students' ability to perform in an English-language medium, and the participants themselves engaged in

the critical thinking, collaborative, and performative skills needed to produce an internationally minded project.



Group A

Global Dengue Control

角田 梨紗
国際感染症学院 D1



私たちのグループは“どのような方法で Dengue 熱を制御すれば良いか”について議論を進めました。

Dengue 熱の原因は Dengue ウィルスで、蚊によって媒介され、感染すると高熱や頭痛、関節炎などを引き起こします。主に熱帯地域や亜熱帯地域で発生しますが、近年媒介者(ベクター)である蚊が気温の低い地域にも生息するようになったことで、Dengue 熱の被害が拡大していることが問題となっています。そこで私たちのグループは、世界全体で取り組むべき対策を“GLOBAL VECTOR CONTROL”と名付け、大きく3つに分けて考えました。第一に「ベクターを減らす」こと、次に「環境中に存在するベクターの伝播経路を

遮断する」こと、最後に「ヒト自身が予防すること」です。

具体的には、遺伝子組み換え技術を用いる手法が挙げられました。次世代に繁殖能力が失われるように遺伝子操作した蚊が近年開発されたため、この技術を世界に広めることで、Dengue 熱の根本の原因である蚊を減らすことができるのではないかと考えました。

また、蚊の繁殖源になりやすいタンクの水にふたをする、殺虫剤や農薬を用いる、窓に網をつけて蚊が家の中に入らないようにするなどの案が出ました。ヒト自身が身を守るためには、外で長時間作業する場合には長袖長ズボンを着用すること、ワクチンが認可されている地域に限りワクチンで事前に予防す

ること、またこれらの対策を含め感染症の予防に関する教育を徹底することが大切だと思いました。

同じグループにさまざまな国籍の学生がいたので、それぞれの国で Dengue 熱がどれくらい流行しているのかを参考にして、解決策を導きました。限られた時間内でまとめることは難しく、そのうえ普段英語でディスカッションする機会が少ない私にとって貴重な経験になりました。

最後に、このようなワークショップの場を提供してくださった先生方、リーディングスタッフのみなさま、そして共に議論した仲間感謝をして報告を終わります。



Group B

In what way can we most effectively combat vectors of dengue?

Thoko Flav Kapalamula
D1, Graduate School of Infectious Diseases



Dengue is a disease caused by a virus that is spread through mosquito bites. Dengue is characterized by fever, headache, nausea, vomiting, rash, and pain in the eyes, joints, and muscles. Dengue global incidence has grown dramatically in recent decades and about half of the world's population is now at risk.

Dengue prevention and control depends on effective vector control measures. Knowledge of the vector biology and ecology is significant in instituting effective control measures. The adult female lays eggs; eggs hatch to larvae and then develop to pupae. Therefore, the important stages to target are adult mosquito, eggs or larvae because they are susceptible to most of the controlling measures. Dengue vectors can be controlled through the promotion of

integrated sustainable vector management methods. These are environmentally friendly, common sense approaches to control vectors and include;

- Protecting oneself from mosquitoes bite through wearing long sleeved clothes, applying repellents, sleeping in mosquito nets, coils and vaporizers.
- Preventing mosquitoes from accessing egg-laying habitats by
 - Environmental management and modification through cleaning debris mosquito habitats, covering, emptying and cleaning of domestic water storage containers e.g. used tires
 - Applying appropriate insecticides or used vehicle oil to stagnant water facilities and/or outdoor containers in order to limit air exchange between the atmosphere and breeding water. With such measures the

mosquitos' population will decrease because of unavailability of breeding places.

- Growing fish and frogs in water ponds around homes, these prey on mosquito eggs and larvae and hence reducing the mosquito population.
- Improving community participation and mobilization for sustained vector control through mass media and other available communication ways.
- Instituting proper government policies on control of mosquitoes. This may advance community awareness and commitment in controlling mosquitoes. Such policies may include proper disposal of solid waste.
- Active monitoring and surveillance of vectors should be carried out to determine effectiveness of control interventions.

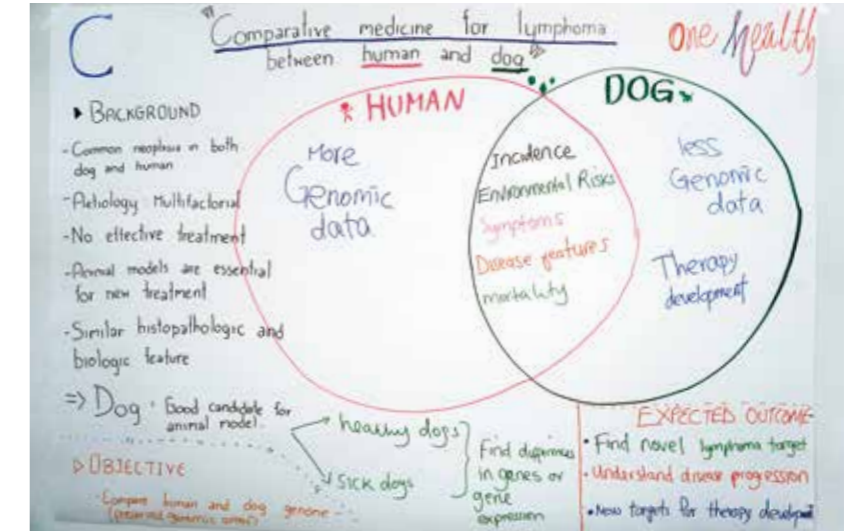
Therefore, the most effective way to combat dengue vectors is through application of integrated vector management methods. These involve multiple control methods such as biological, chemical, physical and environmental control through collaborative efforts of multiple disciplines targeting personal, community and global levels in order to attain optimal health (one health system).



Group C

Comparative Medicine

永田 矩之
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第4回グローバルリーダーズワークショップにおいて、私たちのグループは、「Comparative Medicine」特に「比較腫瘍学」の分野で、私たち獣医師が研究を通じてどのように「One health」へ貢献できるか討論を行いました。乳腺腫瘍、メラノーマ、脳腫瘍などの様々ながんの中で、私たちのグループはヒトと犬で多くの共通点を持つ「リンパ腫」をテーマとして選択しました。リンパ腫、特に非ホジキンリンパ腫は、ヒトと犬ともに最も一般的ながんの一つで、発生率、病理組織学的所見、臨床的挙動および治療法などが非常に類似しています。また、リンパ腫は根治困難ながんであることもよく知られており、新規治療法の開発が切望されています。新規治療法を開発する上で動物モデルは必要不可欠ですが、リンパ腫の動物モデル

として一般的に用いられてきたマウスは、ヒトのリンパ腫を忠実に再現できないことが問題でした。そこで近年、ヒトのリンパ腫と多くの類似点を持つ犬のリンパ腫が、自然発症動物モデルとして注目されてきています。私たちは特に、リンパ腫の発症に関する遺伝子に注目しました。ヒトやマウスに比べて犬の遺伝情報は限られていますが、ある特定の犬種がリンパ腫になりやすいことが明らかになっています。これは、特定の犬種が持つ特定の遺伝子がリンパ腫の発症に関連していることを示唆しています。そこで私たちは、リンパ腫を発症しやすい特定の犬種において、リンパ腫に罹患した犬と罹患していない犬の遺伝子を比較することで、発症に関わる新規遺伝子を同定できるのではないかと考えました。リンパ腫発症に関わる遺伝子が

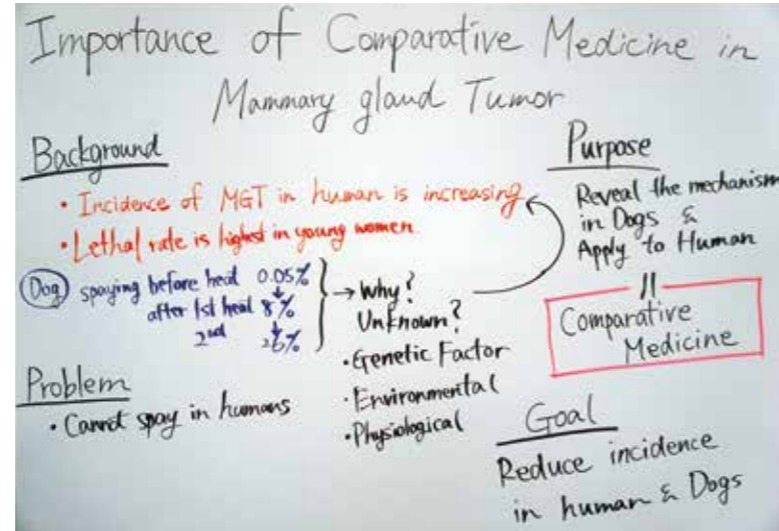
明らかになれば、リンパ腫の発症機構ならびに新規標的分子の解明につながり、新規治療法の開発へ貢献できる可能性が考えられました。今回、英語でのグループディスカッションを初めて経験し、自分の伝えたいことを伝えられないもどかしさや限られた時間の中で意見をまとめることの難しさを感じました。一方で、互いの意見を交換して議論し、最終的に一つのプレゼンテーションを作り上げることで大きな達成感を得ることができました。このような貴重な経験をさせていただき、Mike先生、堀内先生、青島先生をはじめとしたファシリテーターの先生方、リーディングオフィスのスタッフの方々にお礼申し上げます。



Group D

Importance of comparative medicine in mammary gland tumor

Wessam Mohamed Ahmed Mohamed
D2, Graduate School of Veterinary Medicine



Comparative medicine is a distinct discipline of experimental medicine that uses animal models of human and animal disease in translational and biomedical research as identified by the department of Comparative Medicine at Stanford University. As some animal diseases are very similar to the human diseases with more or less degrees of resemblances. Human and veterinary medicine can work together under the concept of one health to foster knowledge and improve the health of humans and animals.

advantages of using naturally occurring disease models as well as it decreases drawbacks of the created animal models. Disease pathogenesis in the naturally occurring models is much similar to that in humans. As animals share with humans their environment, they are exposed to the same environmental factors that could initiate the disease. Using comparative medicine we can study and understand the mechanisms of disease, causative factors and treatment procedures that are much close to that's of human patients.

between humans and animals such as dogs. Tumors in dogs occur spontaneously same as in humans; this enhances the use of dogs with cancer as models for certain human cancers. Mammary gland carcinoma is considered as the most common tumors among the group with considering species genetic variations. German shepherd dogs have been reported to have an increased risk of developing breast or mammary tumors compared to other breeds.

Spaying can largely affect the risk of developing cancer, especially if spaying occurs before having the chance to go into heat. Risk of developing cancer with spaying before heat is 0.05 and increased to 26% after second heat. Although spaying is very useful in decreasing the risk of tumors in dogs, but it cannot be applied at the human level. Using naturally occurring animal models to investigate the mechanism of spaying and factors affecting it. In the study we investigate genetic, physiological or environmental factors that could be involved in cancer development mechanism.



Group E

“Re” Birth of Tasmanian Tiger

細谷 実里奈
獣医学院 D1

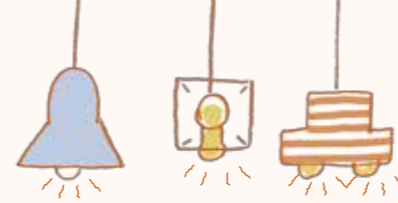


我々のグループはCandidates for De-Extinction: Which species would you resurrect?をテーマにディスカッションを行った。マンモスやオーロックスをはじめとする絶滅した生物種の中から、我々は復活させるべき種として“フクロオオカミ”を選択した。フクロオオカミは、オーストラリアのタスマニア島に生息していたが、人類の乱獲やその家畜であったディンゴとの獲物をめぐる競争に敗れ1936年に絶滅した。フクロオオカミの復活には多くの利点がある。第一に、フクロオオカミの復活はタスマニアデビルの救世主になり得る。フクロオオカミはタスマニアデビルと同じく肉食有袋類に分類される。タスマニアデビルは伝染性の顔面腫瘍が原因で急激に個体数が減り、

今や絶滅危惧種に指定されるほどだ。フクロオオカミはタスマニアデビルの生態・生理学の解明に貢献し、その絶滅を食い止める可能性を秘める。第二に、一般人の支持を得やすい点だ。絶滅種の復活については、資金面や倫理面から反対意見もあり議論が尽きないが、科学者のみならず一般市民からの賛成意見は大変心強い味方となる。フクロオオカミは身体の後ろにトラの縦じま模様をもつイヌのような動物だ。その可愛い外見で、市民に向けたプロモーションでは大成功を収め、種の復活事業がスムーズに進むだろう。最後に、遺伝子工学によるクローニングが容易な点である。具体的には、世界中に約500検体も保存されているフクロオオカミ

の皮膚や骨などの組織からDNAを抽出し、近縁種のタスマニアデビルに受胎させることで、フクロオオカミを復活させることができる。以上より、我々はフクロオオカミをタスマニア島に復活させ、人類の身勝手によって失ってしまった島の自然環境を取り戻すべきだと結論づけた。英語でのディスカッションやプレゼンテーションは難しかったが、オブザーバーとして参加して下さったRamiro先生の助言も得て、グループ全員のアイデアが詰まったプレゼンテーションに仕上げることができた。今回のワークショップで得られた経験は、グローバルリーダーを目指す我々にとって大変貴重なものである。



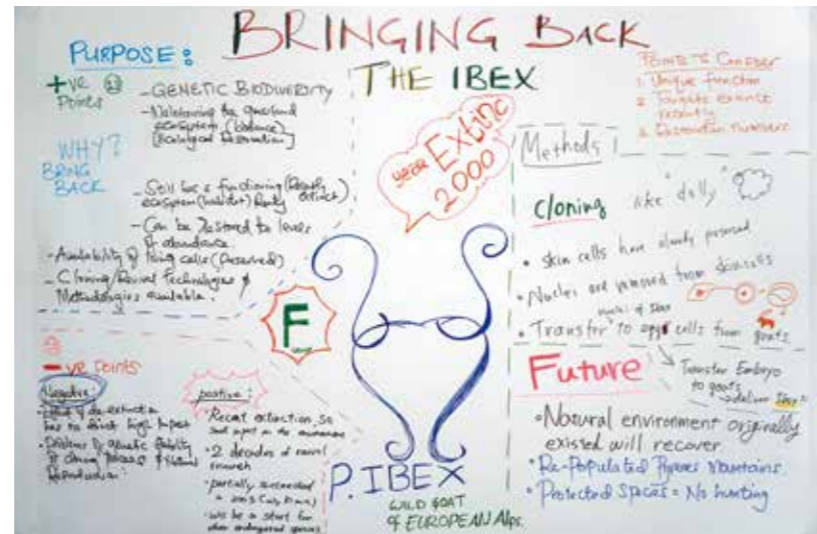


Message from Faculty

Group F

Bringing back the ibex

Christida Estu Wastika
D1, Graduate School of Infectious Diseases



As mid-sized laboratory, it is impossible to resurrect an animal which extinct long time ago, such as mammoth and dinosaurs which do not have any living cells preserved. Resurrected the Pyrenean ibex will be more feasible because scientist already preserved the living cells from the last does which died in 2000. Beside the last experiment partially success, we can use their data and evaluate it to make a new de-extinction of ibex project. The newborn ibex, which lived for several minutes because of the lung defects, was created using cloning method. Embryo was constructed from

epithelial bucardo's cells and injected into enucleated oocyte of domestic goat. Then, the embryo transferred to Spanish ibex or hybrids (Spanish ibex X domestic goat) (Folch, et al. 2008).

One success story of animal re-introduction is the grey wolf's re-introduction in Yellowstone national park, USA. In 1926, the grey wolves being extirpated and the ecology of Yellowstone changed drastically. Elk population grew rapidly without any predator and it changed the river condition by eating the willow in winter, which needed for beaver to survive. The alteration of

river condition suppresses the beaver colonies. After the grey wolves' introduction, the elk colonies moving around trough winter and beaver can use the willow to build their nest.

Bringing back ibex is the most possible de-extinction project for now. Even though the direct impact of ibex re-introduction is still unknown, reviving ibex might be help other research about reviving extinct animals. Minimizing the cause of extinction with giving education to local resident, people who like hunting or other activities that can harm wildlife and minimizing the disease occurrence will slowing the rate of extinction and help ibex to survive when returned in their natural habitat.

REFERENCE:
Folch J, Cocero MJ, Chesne P, Alabart JL, Dominguez V, Cognie Y, Roche A, Fernandez-Arias A, Marti JI, Sanchez P, Echegoyen E, Beckers JF, Bonastre AS, Vignon X. First birth of animal from an extinct subspecies (*Capra pyrenaica pyrenaica*) by cloning. *Theriogenology* 2009; 71 (6):1026-1034.



Teaching English to PhD candidates of Veterinary Medicine

Michael Henshaw
Assistant Professor of English as a Foreign Language
From: California, USA
Now: 10 years teaching English in Sapporo



Professional interests.

Although I teach highly specialized doctoral course life scientists, my own background and interests are highly interdisciplinary. I'm not so interested in *doing science*, but I want to know *how science works*. I also try to integrate cross-cultural understanding, history, math, and more into my English teaching. In my current research I've assembled a 1.5 million-word, 356-article corpus of journals related to veterinary medicine. I will give it to students along with a freeware computer application for their reference and advice on word usage when writing.

I come to work each day with an appreciation that I'm aiding the campaign for One Health, the global initiative to integrate health systems of humans, animals, and environments. I like big ideas. I like that our school coordinates with the World Health Organization (WHO), the World Organisation for Animal Health (OIE), and is deeply involved in collaboration with institutions in Zambia, Thailand, Mongolia, and more. Big ideas and programs like these need many things, and certainly one of them is competent English communication.

The reasons to learn English.

To achieve the ideals of One Health, more people need to talk to each other. We humans have trouble fully appreciating a situation until we have talked about it with another person. If we are to be interested in global solutions then we need to use the *lingua franca*. Possessing English proficiency opens many doors as it is the majority language of publication of new scientific research. Even though English was spread around the world by a violent colonialism, it can now be a tool for peace in the hands of scientists for whom using English is the best way to make themselves heard, the best way to make their research felt among the global pulse of scientific progress.

English education environment at VetMed.

The Leading Program gives PhD students an experience they can't get at a typical language school. At an average of four students per class, there is flexibility to adjust each lesson to fit their highly specialized needs. Thus, courses such as Public Speaking, Presenting Slides, and Dilemmas in Bioethics are offered, plus various workshops and public presentations are organized. The overriding goal of the English program is to give students the language tools they need to be successful international researchers.