



Hokkaido University, Program, for Leading Graduate Schools Fostering Global Leaders in Veterinary Science toward Contributing to “One Health”



Hokkaido University was founded in 1876 as Sapporo Agricultural College, the first higher educational institution for agricultural sciences in Japan.

The Graduate School of Veterinary Medicine at Hokkaido University provides a Ph.D course for global-scale practical research and education with a focus on the interface between humans and animals based on the One Health concept.

The Ph.D program includes two courses for expert training in zoonotic disease control and chemical hazards. On these courses, postgraduate education is provided to support the development of leaders with outstanding expertise who can exercise leadership in the field of veterinary science.

What is the One Health concept?

The ideal of One World – One Health can be achieved only by maintaining the integrity of ecosystems, including the health of humans and wildlife. Contributions from the field of veterinary science, which carries a responsibility to ensure the health of animals and people alike, are now needed on a global scale to support the soundness of ecosystems and health.

Features of the program

Toward the One World - One Health ideal

Infectious diseases pay no heed to national borders. Mankind has always been threatened by zoonoses, such as influenza, Ebola hemorrhagic fever, SARS, tuberculosis and prion diseases. As seen with the emergence and pandemic of the swine-originating H1N1 flu virus in 2009 and the enterohemorrhagic E. coli (O104) crisis of 2011, it is not possible to predict outbreaks of emerging or re-emerging infectious diseases. The 2010 outbreak of a foot-and-mouth disease highlighted the tremendous effects that trans-border infectious diseases in animals have on society and the threat they pose to the supply of animal protein.



Human/animal health and ecosystems are threatened not only by biohazards (such as infectious disease-causing pathogens and microbial toxins) but also by hazards from chemicals discharged into the environment as a result of man's production activities. These hazards include poisonous metals such as mercury, cadmium and lead, pollutants such as DDT, PCB and dioxins, and emerging pollutants contained in flame-retardants and surfactants known to have caused global-scale contamination. **People living today's modern lifestyles of convenience have a**

duty to pass safe living environments on to future generations. Infectious diseases and health hazards from chemicals are often activated at the interface between humans and animals, only manifesting themselves after they have gradually spread. To protect our environment from hazards and realize the One World - One Health ideal, it is imperative to detect minute changes and abnormalities at this interface so that appropriate preventive measures can be taken. In light of this, contributions from veterinary medicine and veterinarians, who carry a responsibility to ensure the health of animals and people alike, are now needed on a global scale to support the soundness of ecosystems and health.



The Fostering Global Leaders in Veterinary Science for Contribution to One Health program includes two courses for expert training in zoonosis control and chemical hazards at Hokkaido University's Graduate School of Veterinary Medicine. On these courses, **postgraduate education is provided to support the development of leaders with outstanding expertise who can exercise leadership in promoting education and research in their specialized fields and in taking necessary measures** while holistically understanding problems and issues that need to be addressed. In addition to the education and training provided on these courses, efforts will be made toward **the development of an education system benefitting from global-scale industry-university-government collaboration**. Accordingly, postgraduate education will be further advanced and **the development of future global leaders will be promoted**.

Graduate school education reform

The university operates a reformed system of graduate school education to attract a wide diversity of outstanding students and support the development of future global leaders based on the following efforts:

- Providing a special admissions quota for non-Japanese graduates and graduates of external departments, for the purpose of recruiting graduates of diverse nationalities and/or having different academic backgrounds.
- Enhancing education regarding fundamental subjects of veterinary science to improve postgraduates' multi-disciplinary sense and holistic viewpoint.
- Introduction of English course to enhance students' English ability (For non-native speakers)
- Providing extensive courses for fostering expert of zoonosis and chemical hazard control.
- Introduction of international activity support system, including overseas practical epidemiology/collaborative research training, presentation in international conferences, etc, for the purpose of improving postgraduates' skills in applying their expertise to practical needs overseas.
- Implementation of an international internship system toward helping students gain work experience and pursue career paths overseas.
- Introducing various programs that encourage students to be more proactive and aware of their responsibility as experts and that foster communication ability and independency, e.g., seminar and progress report organized by the postgraduates.
- Preparation of research grant program and equipments in common use to support unique, original, creative and/or ambitious research of graduate students.
- Strengthening financial support to postgraduates through a various grant programs including scholarship and TA/RA stipends.

New courses for expert training

The university provides outstanding educational resources and an international framework for practical field-oriented education via two courses for expert training in the control of zoonotic diseases and chemical hazards.

Special Course for Zoonosis Control Expert

In recent years, zoonoses such as influenza, SARS, Ebola hemorrhagic fever, West Nile fever, prion diseases, tuberculosis and rabies have sprung up with high frequency, causing a global-scale threat. The causative agents of zoonoses are originally harmless in their wild host animals, but are occasionally transmitted to other species including humans, causing infectious



diseases. Changes in the global environment and human behavior contribute to the creation of more favorable conditions for pathogens to jump from their natural reservoirs to livestock and people.

In the current worldwide situation, zoonotic disease outbreaks often occur in today's world, causing irrevocable damage to human society due to a lack of resources to control them. Experts in the control of such diseases need not only professional knowledge of zoonoses but also a broad perspective and a sense of internationalism that transcend their own fields of specialization.

In order to produce doctors who take on the world leadership in the design and implementation of zoonosis control measures, this course develops scientific and practical expertise on zoonoses and related pathogens. After successful completion of this course including the Examination of Zoonosis Control Expert Certification Program and Doctoral thesis, students obtain his/her Ph.D. degree in the field of veterinary medicine and are certified as Zoonosis Control Expert by Hokkaido University

Special Course for Chemical Hazard Control Expert

Human/animal health and ecosystems are threatened by hazards from chemicals discharged into the environment as a result of man's production activities. These hazards include poisonous metals such as mercury, cadmium and lead, pollutants such as DDT, PCB and dioxins, and emerging pollutants contained in flame-retardants and surfactants known to have caused global-scale contamination. The control of chemical hazards is a serious and important matter for human and animal health.



POPs (Persistent Organic Pollutants) cross international borders and cause global-scale contamination. WHO has reported that over 2 million people die each year due to disease caused by air pollution. Today, around 15,000 species are listed as endangered, and one cause of the threat they face is environmental pollution stemming from chemical emissions. Veterinary science carries a responsibility to ensure the health of animals and humans alike as well as ecosystems. Against this background, there is an urgent need for the field of veterinary science to contribute to the realization of the One Health ideal.



In this context, the program is intended to support the development of human resources who will address chemical hazard control from a holistic viewpoint and exercise leadership to solve the problem of environmental pollution. After successful completion of this course including the Examination of Chemical Hazard Control Expert Certification Program and Doctoral thesis, students obtain his/her Ph.D. degree in the field of veterinary medicine and are certified as Chemical Hazard Control Expert by Hokkaido University.

Curriculum of the program

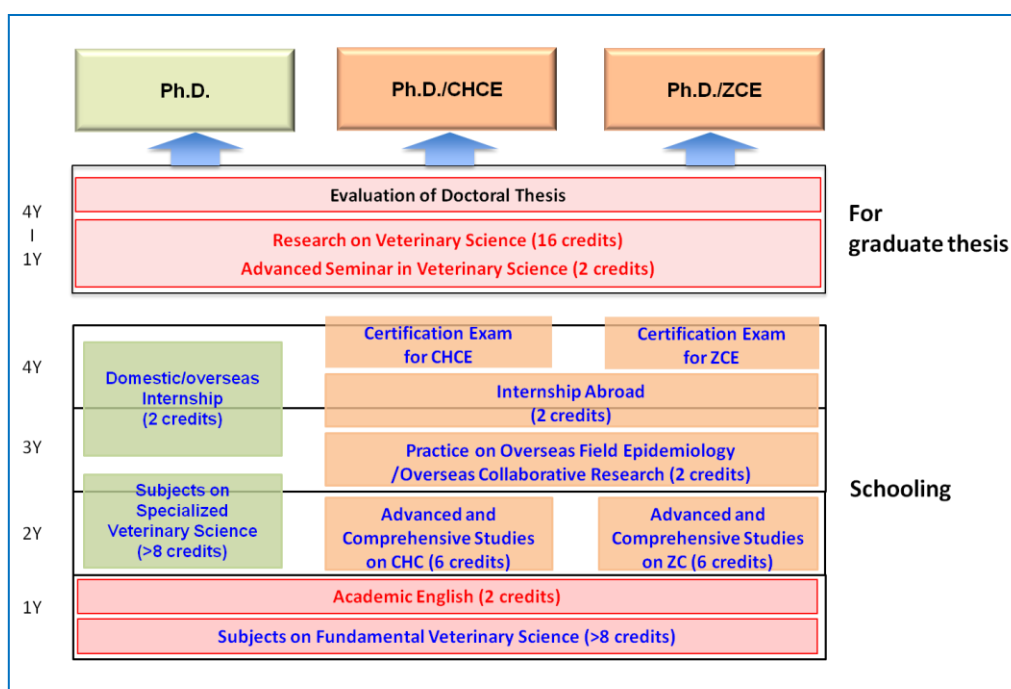
First year

All first-year students take intensive basic subject classes in the Program for Leading Graduate Schools "Fostering Global Leaders in Veterinary Science" to help them acquire a broad academic knowledge base and a holistic viewpoint. Attendance at academic English classes is also compulsory to support the improvement of language skills for future work abroad.

Second year to forth year

1. Special Course for Experts (for the training of experts in chemical hazards and zoonosis control)

These courses consist of Advanced and Comprehensive Studies, Practice on Overseas Field Epidemiology/Collaborative Research, and a period of overseas internships as outlined below. Students earning enough credits for course completion take a certification exam with essay and oral parts. Those passing the examination will be certified as experts in either chemical hazard or zoonosis control.



Advanced and Comprehensive Studies (taught in English)

The purpose of the curriculum is to provide students with the knowledge, skills and problem-solving techniques required of experts.

Practice on Overseas Field Epidemiology/Collaborative Research

Students experience practical education and training and acquire a cosmopolitan outlook through epidemiological fieldwork in developing countries and collaborative research with institutions abroad.

International internship program

Students pursue global career paths based on their experience of working at international organizations.

2. Course for advanced veterinary sciences

Students select subjects from among advanced lectures on veterinary medicine, life science or animal science based on their area of specialty. International/domestic internships are also compulsory as part of career path development.

Message from the Coordinator (Prof. Motohiro Horiuchi)

Our education and research activities cover from laboratories to global fields. Shall we share efforts together toward "Global Leader in Veterinary Science for Contributing to One Health" ?



Even in the 21st century, the emergence of zoonoses, such as influenza, prion diseases, SARS, Ebola hemorrhagic fever, infection of multi-drug resistant mycobacterium, is a big threat to society. We have also realized that transboundary animal infectious diseases, such as foot-and-mouth disease, cause tremendous economic loss and threaten a supply of animal proteins once it occurs. There is no border in the emergence of outbreak of infectious diseases. To protect health of human and animals and as well as economic loss from zoonoses and newly and re-emerging infectious diseases and to ease society's fears against infectious diseases, we need to foster human resources who will play pivotal roles in the control of zoonoses with advanced knowledge and skills on infectious diseases as well as a global and holistic viewpoint to gain an overall picture of the problems as a whole.

In addition to biohazards, hazardous chemicals discharged into environment from the production activities of humans, which includes poisonous metals such as mercury, cadmium and lead, pollutants such as DDT, PCB and dioxin, and emerging pollutants that are known to have caused global-scale contamination, threaten the health of humans and animals.

We have already learnt that health problems by infectious agents and hazardous chemical often appear first at the human-animal interface and then recognize as outbreak after gradually spreading.

"One World One Health" concept, in the other words, the integrity and soundness on the earth, can be ensured only by maintaining the health of humans and animals including companion, production, and captive animals, and wildlife. Since maintenance of the soundness of life environment is the most important mission of veterinary science, contribution of veterinary science is strongly requested to adopt "One Health" approach all over the world. To respond society's demands, in the Program for Leading Graduate Schools "Fostering Global Leader in Veterinary Science for Contributing to One Health" (selected in the academic year 2011, by Ministry of Education, Culture, Sports, Science and Technology [MEXT], Japan), we reinforce toward fostering Ph.D. who are capable of managing control measures against zoonoses and/or hazardous chemicals and can take the leadership toward ensuring "One Health" in international scene, as professional/expert of veterinary science.



To achieve this, the Program for Leading Graduate Schools provides a variety of programs and systems to graduate course students as listed in the section of Graduate School Education Reform, and concentrates on fostering Ph.D. as a professional/expert with practical competency, through fostering and encouraging students' international sense, awareness of their responsibility as experts, identity and independency, and a holistic viewpoint with inter-disciplined sense.

Postgraduates will establish a basis of their profession through the research activities in completing Ph.D. thesis and they of course have to make a lot of effort to complete their thesis. However, in addition to the research environment, our program provides opportunities to foster well-balanced international sense and have a variety of experiences. Experiences in the postgraduate course lay the foundation of the identity as professional and cosmopolitan, and therefore, accumulation of experiences gives a basis of proper judgment with subjective confidence. We are waiting for your admission through preparing opportunities to cultivate a holistic viewpoint and inter-disciplined thought and academic ambiance to broaden a variety of experiences.

Special admission quota and scholarship for international students

To recruit excellent students of diverse nationalities and different academic backgrounds, up to 4 non-Japanese students will be selected through a special selection process for international students in the academic year 2013. Prior to submission, applicants should contact and discuss with their expected principal supervisor. This is highly important because during the selection process, we particularly consider the applicant's history of contact (correspondence) and/or discussion with their expected principal supervisor. Moreover, applicants from universities that have an academic exchange agreement or an equivalent with the Graduate School of Veterinary Medicine, Hokkaido University, are strongly encouraged. On the basis of documents submitted, applicants will be selected by the Committee for International Affairs in the Graduate School of Veterinary Medicine.

Non-Japanese students who are successfully selected and admitted to the Graduate School of Veterinary Medicine will receive a scholarship [200,000 yen (JPY) per month] supported by the Leading Program. The scholarship will be extended annually up to the standard duration of the course (4 years) if the Steering Committee of the Leading Program qualifies the overall performance of the recipient as satisfactory during annual assessment. The allowance of the scholarship will change depending on Japan's economic and the University's granting situation.

The scholarship holders should be deeply impressed by the philosophy of the Program for Leading Graduate Schools "Fostering global leader in veterinary science for contributing to one health", and should devote themselves to their graduate studies with a deserving attitude.



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