



HOKKAIDO UNIVERSITY  
WISE Program for  
**One Health Frontier**  
Graduate School of Excellence

### Contact

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"OH-chan" is our mascot.  
You can draw OH-chan with an O, H, and F,  
acronym for One Health Frontier.



# WISE Program for One Health Frontier Graduate School of Excellence

A program that produces a philosophy of  
disease control and a balanced international perspective,  
seeing the health of animals, people and  
the ecosystem from a higher point of view and designing  
solutions involving One Health



HOKKAIDO  
UNIVERSITY



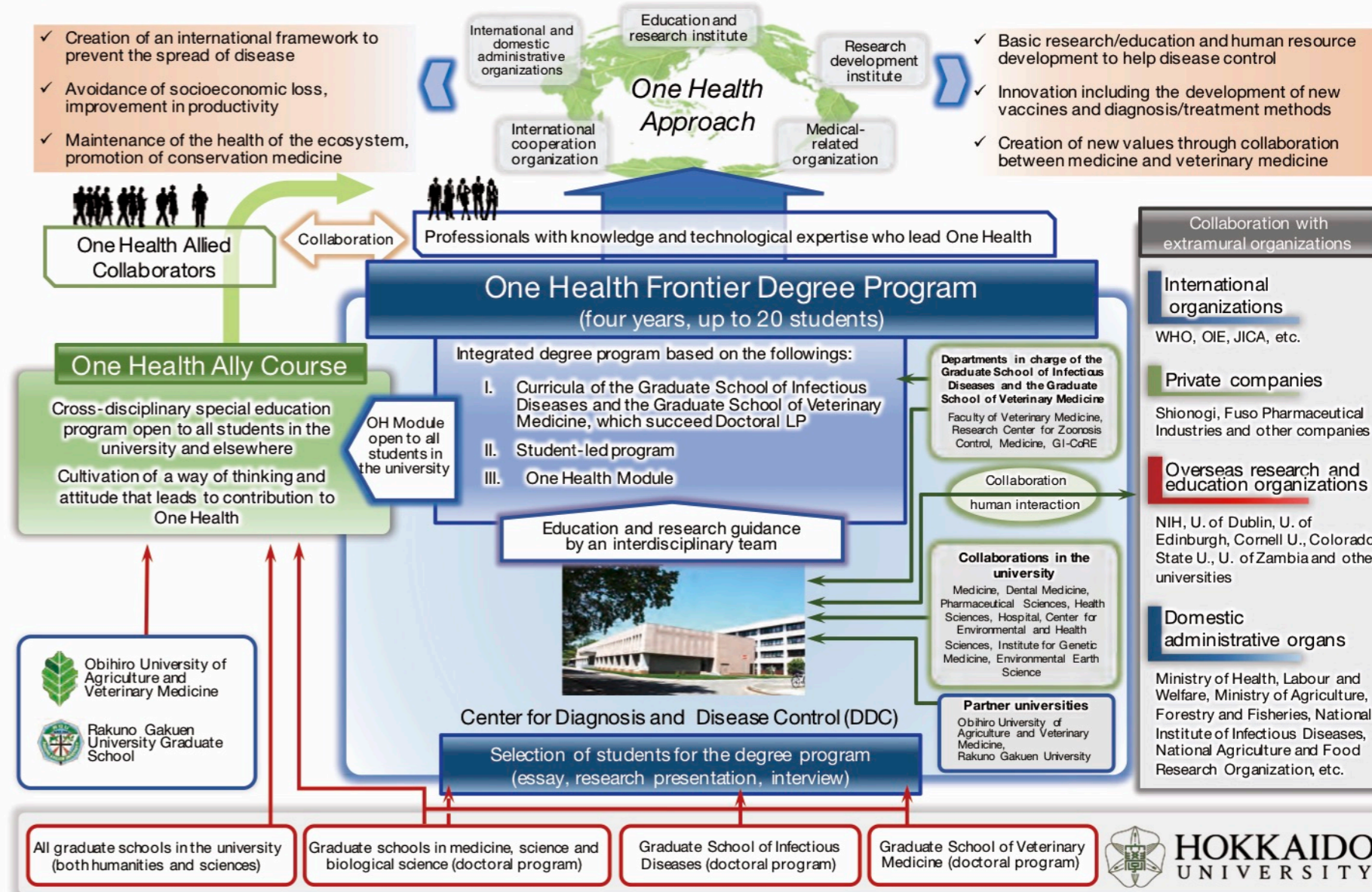
# One Health Frontier Graduate School of Excellence

The development of preventive and curative medicine and the promotion of preventive measures have made it possible to control certain infectious diseases. At the same time, however, emerging and re-emerging infectious diseases have successively occurred, posing a threat to humankind. In addition, health hazards to humans and animals due to chemicals and the destruction of the ecosystem constantly occur as people enjoy the conveniences of life. These problems occur beyond national boundaries. We now have a mission to promote a healthy environment of humans and animals from damaging hazards (infectious pathogens and chemicals) and preserve a sustainable and healthy environment and ecosystem for future generations.

The One Health Frontier Graduate School of Excellence, promoted by Graduate School of Veterinary Medicine and Graduate School of Infectious Diseases, Hokkaido University, produces experts with a clear philosophy of disease control and a balanced international perspective who can see the health of animals, humans and the ecosystem from a higher point of view and who can design and implement solutions involving One Health: professionals with knowledge and technological expertise.



## Program Overview



## Characteristics of this program

### Leveraging advantages of the university


This is an educational program supported by extensive university disciplines, including veterinary medicine, infectious disease medicine, medicine, dentistry, pharmacology, health science and environmental science, as well as collaborative international administrative/cooperative organizations, partner Universities and private companies.

### Leading an international advanced research team

Its aim is to serve as an advanced global research center that is engaged in basic research as well as global practical activities related to problems arising from the two major hazards of infectious agents (biohazard) and chemical substances (chemical hazard), such as zoonoses and health and socioeconomic damage due to chemical substances.


### Bestowing exceptional strengths

Characteristic initiatives of One Health are made available to graduate students in both humanities and sciences at Hokkaido University and partner Universities as the One Health Ally Course, an inter-graduate school and interuniversity special educational program. Students can study a minor in addition to a major through the Hokkaido University Major Minor System, which is intended to provide extra learning for graduate students and increase their value.

 refer to page 5

### Assembling a diversity of human resources

The program globally promotes interdisciplinary and practical education and research related to One Health. As an institute that plays a part in this effort, the Center for Diagnosis and Disease Control will be established. The center is intended to be a platform where diverse experts gather beyond institutional, laboratory and sectional boundaries and proceed with education and research with One Health as the common goal.

 refer to page 7

## What is One Health?

The concept of One Health originates in the 19th century idea of “zoonosis” introduced by German pathologist Rudolf Virchow. The necessity of the One Health approach, an interdisciplinary, collaborative effort by multiple sectors to control zoonoses and maintain the health of ecosystems, was proposed in the 2004 Manhattan Principles of the Wildlife Conservation Society. The concept of One Health has since evolved, and further collaboration between medicine and veterinary medicine is needed from the perspective of Zoobiquity, which highlights how collaboration between medicine and veterinary medicine leads to the improved health of people and animals because of their commonalities in diseases.



## Message

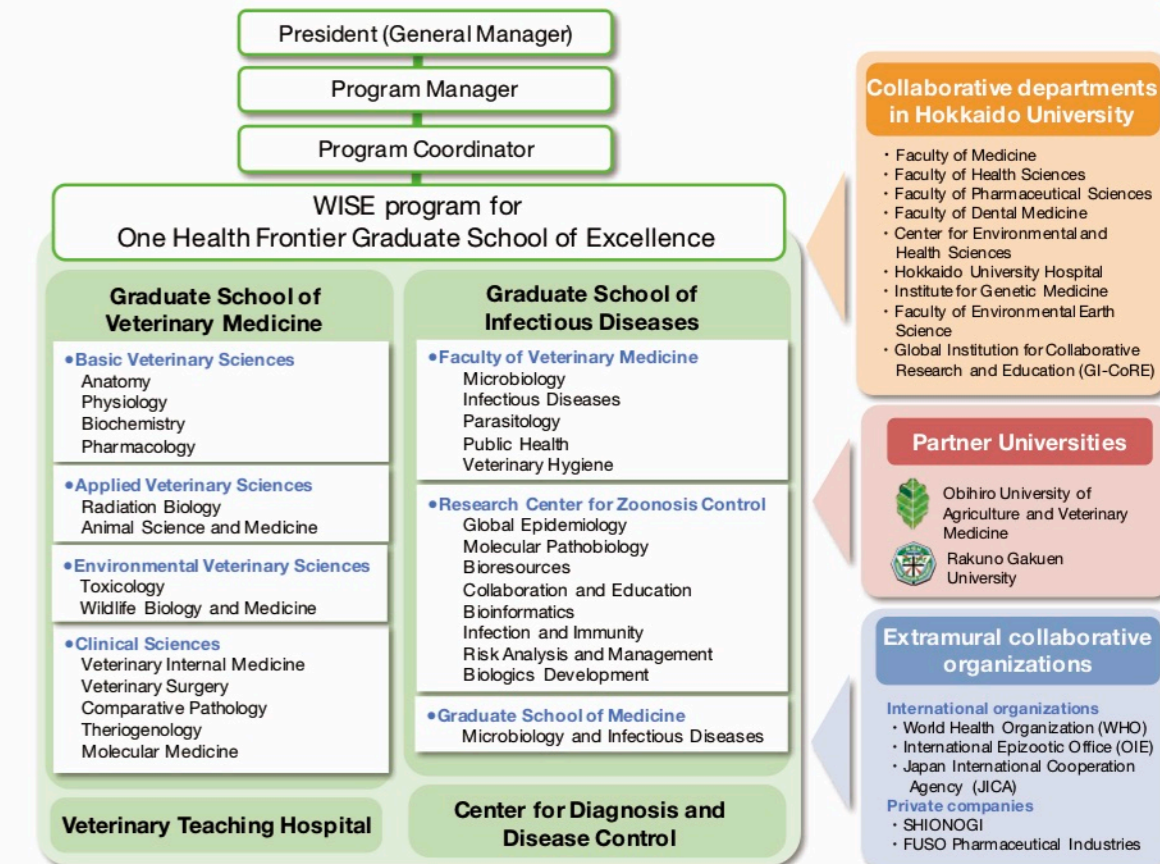


Program Coordinator  
Hokkaido University,  
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**Motohiro HORIUCHI**

Zoonosis and emerging and re-emerging infectious diseases, such as influenza, Ebola hemorrhagic fever, tuberculosis, and antimicrobial-resistant bacterial infections appear one after another and threaten public health. Transboundary animal infectious diseases, such as foot-and-mouth disease and classical swine fever, cause severe economic damage once they enter. Hazards chemicals discharged into environment that include poisonous metals, pollutants such as dioxin, and persistent organic pollutants, are known to have caused global-scale contamination and threaten the health of humans and animals. Health and socio-economic problems by infectious diseases and hazardous chemicals are continuously occurring. Contemporary humans, who have been receiving lives of convenience, are obliged to pass soundness and integrity of living environments on to the next generations. There are many diseases such as cancer, urological and neurological disorders, which are commonly observed in humans and animals, other than infectious diseases. Based on the concept that researches on physiological difference and similarity of diseases greatly contributes to both human and animal health, “Zoobiquity”, which proposes the reinforcement of collaboration between medicine and veterinary medicine, is recently drawing international attention.

To ensure the critical concept of this program “One Health”, multi-disciplinary collaboration such as medicine, veterinary medicine, and environmental science, and trans-sectoral cooperation with human and animal health sectors, education, research and development institutions, and risk management authorities, in other words, “One Health Approach”, is essential. In this program, we promote advanced researches using excellent research and human resources and outstanding experiences on infectious diseases, chemical hazard, and animal and life sciences for contributing One Health. Additionally, PhD course students will gain a variety of experiences of international collaborative research with reliable counterparts, cooperative activity with international organization such as WHO, OIE, and JICA, and/or development research in collaboration with public institution and company. This program aims at fostering professional/expert (superior PhD) who will be able to tackle and resolve problems related to One Health, with a definite idea for disease control and prevention, a holistic viewpoint, a well-balanced international sense, and a comprehensive competence for decision-making and problem-solving.

## Organization

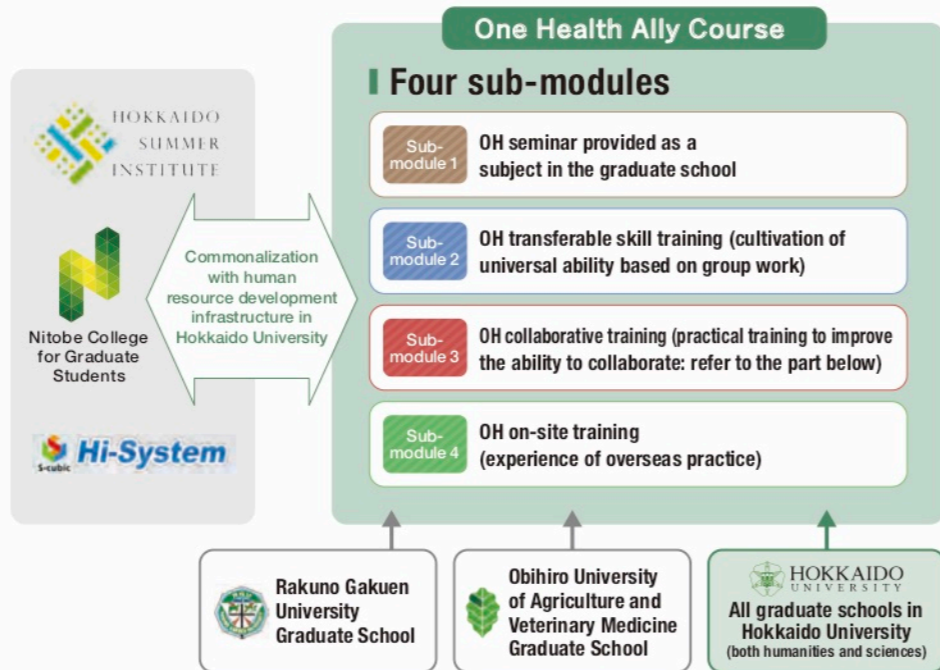




# One Health Ally Course

Inter-graduate school and inter-university special educational program to provide the essence of One Health for students in both humanities and sciences

To realize One Health, experts produced in this program are required to become leaders of One Health, and it is also necessary for experts from various fields to participate in this initiative. The OH Module in this program is practical education provided through industry-academia-government collaboration with the units of the DDC Center at its center. The participation of graduate school students from both humanities and sciences in this exceptional module allows students from different backgrounds to interact with each other, leading to future interdisciplinary activities. This will be a meaningful course for students who are interested in international organizations and overseas activities but who have no such opportunities. This course is comprised of the following four sub-modules. The hours required for learning can be converted to eight credits. Students who have completed this course receive a diploma.



Touchstone of graduate school education reform to implement the Hokkaido University Major Minor System, which is intended to provide extra learning for graduate students and increase their value

## Establishment of the One Health Ally Course as a touchstone of graduate school education reform

Hokkaido University plans to introduce the Hokkaido University Major Minor System, which is intended to provide extra learning for graduate students and increase their value. This special educational program provides an opportunity for graduate students to acquire extra learning. It is also a special educational program that forms the foundation for competency required in WHO and other international organizations, for those who wish to work for such institutions.

Sub-module 1

Leaning of basics of One Health

Sub-module 2

Development of universal ability, including explanation and debate capabilities, through group work for problem-solving and policy planning

Acquisition of transferable skills



Problem-solving simulation



student-led debate on antimicrobial resistance

Sub-module 3

Cultivation of an ability to collaborate through participation in joint research and support for conferences by international administrative organizations

Experience of collaborative activities



Conference on bird flu control (FAO Vietnam)



Survey on infectious diseases (WHO Philippines)

Sub-module 4

Experience of the One Health approach through practical surveys and joint research overseas

Practical experience overseas



Heavy metal pollution of fish (Ethiopia)

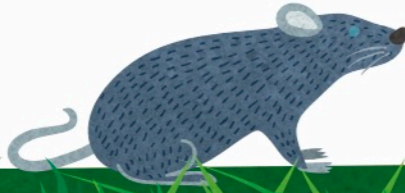


Survey on filovirus in bats (Zambia)

### Sub-module 3

The core of the course, involving the following activities

- 1 Students experience activities at an international organization by helping with its work, such as preparation, running and reporting at a meeting held by the international organization.
- 2 Students create disease risk profiles by region, by cause, by animal type and by insect vector on a global basis. Using these profiles, they conduct a needs assessment, perform development research on diagnostic, examination and treatment methods, and build a system that enables technical cooperation and training that meets the needs of trainees.
- 3 Students experience regulatory science promoted through collaboration between medicine and veterinary medicine and explore basic research seeds, such as infection control and drug-resistant bacteria control at hospitals and animal clinics, pharmaceutical application, the collection of information on differences in diseases between people and animals, and the setting of important items in the promotion of Zoobiquity.
- 4 Students participate in a joint research project to create databases and sample banks, which are promoted by the DDC Center, to understand the need of collaboration to realize One Health.





# Center for Diagnosis and Disease Control (DDC Center)

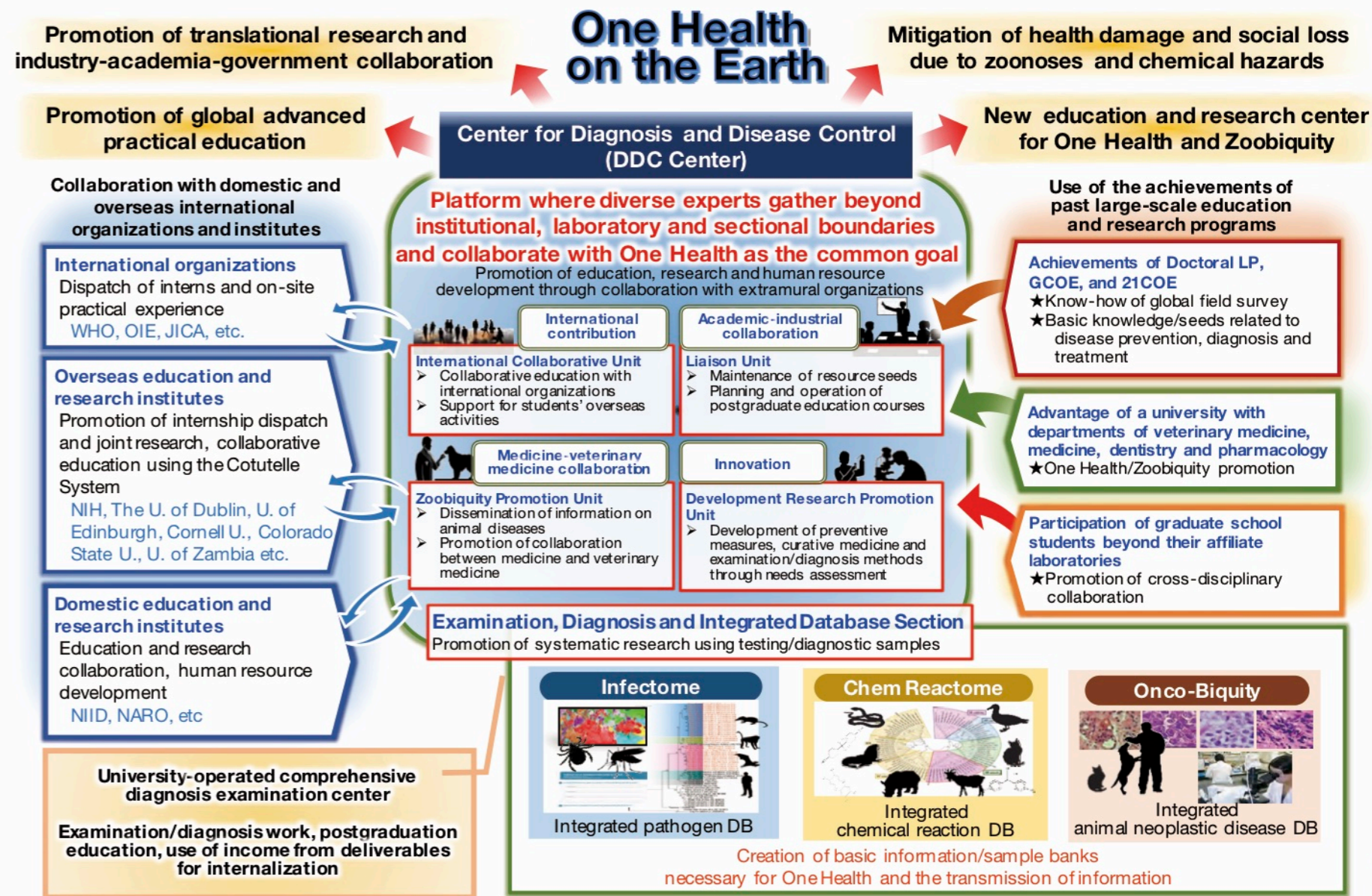
A single collaborative center to join the forces of diverse organizations, laboratories, and departments in service of realizing One Health research goals and dreams

New units have been established to realize our mission: the International Collaborative Unit, the Zoobiquity Promotion Unit, the Liaison Unit, and the Development Research Promotion Unit. Our faculty members, in cooperation with experts from a variety of institutions, work to predict the risk of infection, detect potential chemical contamination, advance medical and veterinary medical care, and implement research projects. Students in this program can participate in projects, demonstrating the group skills, explanation capability and ability to collaborate that they have developed in the One Health Module, and receive practical education, including assistance for activities at international organizations and needs assessments. In addition, this center systematically promotes projects to create databases and sample banks from a long-term perspective, including the Infectome Project (creation of a database and a biological sample bank by exhaus-

tively collecting the genetic information of pathogens held by animal and arthropod vectors), the Chem-reactome Project (creation of a database and a biological sample bank of species differences in response to chemical substances), and the Onco-biquity Project (creation of an integrated database and a biological sample bank of neoplastic diseases pathognomonic for animal species). An integrated bank comprised of databases and sample banks created in these projects will be the basic information/resources that are expected to be used for the creation of social values necessary to realize One Health.



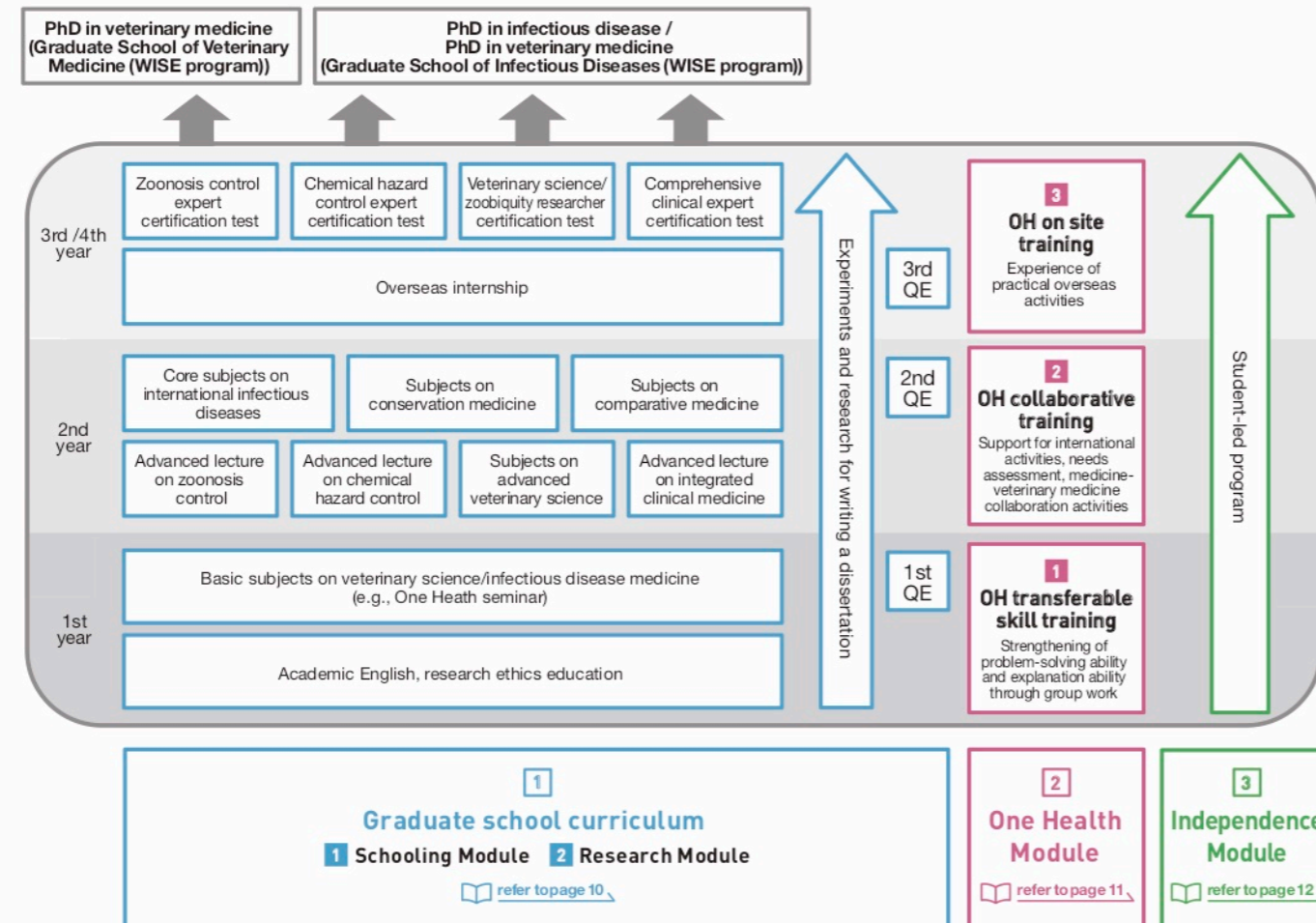
Establishment of the Center for Diagnosis and Disease Control as a platform where diverse experts gather and collaborate



# Course outline

The graduate school curriculum for earning a degree and the program to produce experts who can design and implement solutions for issues involved in One Health (professionals with knowledge and technological expertise) are comprised of four modules

## One Health Frontier Degree Program



# 1 Graduate school curriculum

This curriculum is comprised of two modules for earning a degree

→ The degrees to be awarded are a PhD in infectious disease and a PhD in veterinary medicine

→ The subjects to be taken vary depending on the desired degree.

→ Students who have studied designated graduate school subjects and passed an accreditation test are certified as zoonosis control experts, chemical hazard control experts and integrated clinical experts.

## 1 Schooling Module

### First year: Interdisciplinary Frame I

- Academic English (compulsory): English training by a native English-speaking Specially Appointed Instructor belonging to the Faculty of Veterinary Medicine. A variety of classes are provided depending on the skills and needs of students. Custom-made follow-up classes are also available.
- Research Ethics Exercise (compulsory): Students deepen their understanding of research ethics as researchers and workers in society.
- Veterinary Medicine and Infectious Disease Medicine Basic Subjects (elective): Subjects to form the interdisciplinary academic foundation, including the One Health Seminar



Academic English

### Second year: Specialized Frame I and Specialized Frame II

Subjects to strengthen expertise in important disciplines involved in One Health, including infections, chemical hazards, Zoobiology, veterinary medicine and clinical practice (elective, compulsory)

### Third to fourth years: Internship

Overseas internship aimed at general training (compulsory). The internship allows students to not only undertake work experience but also reconfirm the expertise needed by society, helping them to develop an ability to see the whole picture from a higher point of view and raise their learning motivation.



Overseas internship

## 2 Research Module

Module to build the lifelong foundation for expertise through experiments and research for writing a dissertation. The Qualifying Examination (QE) focusing on an oral exam to check the eligibility to submit a dissertation is conducted three times to ensure the quality of the degree and the transparency of the examination.



Qualifying examination

## 2 One Health Module

Module to deepen students' understanding of One Health and cultivate a balanced international sense and ability to collaborate

### 1 OH transferable skill training

Workshop to propose solutions for extensive issues involved in One Health in a group discussion style. This training aims to cultivate group skills, explanation capability, quick decision-making capacity and an ability to collaborate.



Group discussion

### 2 OH collaborative training

The units of the Center for Diagnosis and Disease Control (page 7) create an industry-academia-government team to provide courses in which students can experience supporting international organization activities, technical cooperation and needs assessment for development research, medicine-veterinary medicine collaboration activities promoting Zoonosis, and practical regulatory research. Students also improve their ability to collaborate by participating in joint research projects organized by the center.



Participation in joint research project

### 3 OH on site training

Students experience assisting developing countries through JICA, an epidemiological survey in overseas fields, joint research and other practical overseas activities. On-site experiences are expected to improve students' communication skills, expand their perspective, and enhance their learning motivation.



Overseas activity

## Course outline

## 3 Independence Module (student-led program)

Module to cultivate a sense of responsibility, planning and operating abilities and the momentum to undertake cross-disciplinary research

- Progress** ..... Students freely discuss their own research.
- Leading Seminar** ..... Students take responsibility for all steps of the program, from the selection of lecturers to the organization of a lecture meeting.
- SaSSOH** ..... A cross-disciplinary international symposium jointly held by students and young faculty members



### SaSSOH Sapporo Summer Symposium for One Health

An international symposium planned and implemented by students and young faculty members to cultivate students' independence, communication skills and planning ability. This event allows students to learn cutting-edge knowledge from overseas guests who are leading experts in One Health fields and to build a global network, and provides them with a training opportunity to play a role on the global stage. The symposium has been held once a year since 2013, and the Active Discussion Session and the Student Session were added at the fourth event to hold workshops to learn planning and operating abilities. The aim is to produce experts who can exercise their leadership at the site of a zoonosis or chemical hazard.



## Course outline

# Student support

Here is an outline of this program's support for doctoral students



## Educational and research fund support system

To produce experts who can contribute to the development of veterinary medicine not only in Japan but also elsewhere and who can design and implement solutions for issues involved in One Health, a scholarship is provided for excellent graduate students selected for this program to ease their financial burden and anxiety so they can focus on their studies.

## Graduate School of Excellence research fund system

This system is intended to provide research funds for research plans based on the unhindered, creative or ambitious ideas of graduate students to support the realization of the plans. Students can train themselves to create a research plan, implement research based on the plan and make a report so as to earn competitive research funds in the future. They can also obtain a deeper understanding about the need for research funds and the significance of competitive funds, and raise self-awareness of their responsibility as users of public funds. A single type and a group proposal type are set up to encourage the joint research of students.

## Teaching assistant (TA) system

Teaching experience in practical training and classes is valuable for graduate students to become professionals who take a leading role in highly specialized education. In this teaching assistant system, excellent graduate students selected for this program are employed as teaching assistants to promote educational research and develop their teaching skills.

## System supporting dispatch to international academic conferences

This system provides support for travel expenses to encourage graduate school students to make presentations at international conferences and promote interaction with researchers so that the students can further their education as global leaders from experience on a global stage.

## Overseas internship support system

This system provides support for travel expenses so that students can engage in internship activities overseas.

## Research assistant (RA) system

Research work experience is valuable for graduate students to become professionals who play a leading role in the research field or highly specialized education. In this system, research assistants are publicly sought from excellent graduate students selected for this program to promote educational research and develop their research skills.

## System supporting applications for the Research Fellowship for Young Scientists by the Japan Society for the Promotion of Science

The Research Fellowship for Young Scientists is a system with which the Japan Society for the Promotion of Science grants research scholarships (salaries) and research funds for young scientists to provide an opportunity for young scientists to independently choose a research subject based on their unhindered thinking and focus on their research. This system aims to develop and secure scientists. Earning the fellowship not only eases financial burden but also helps with career advancement. This program offers active support for such applications.

## Learning/senior mentor system

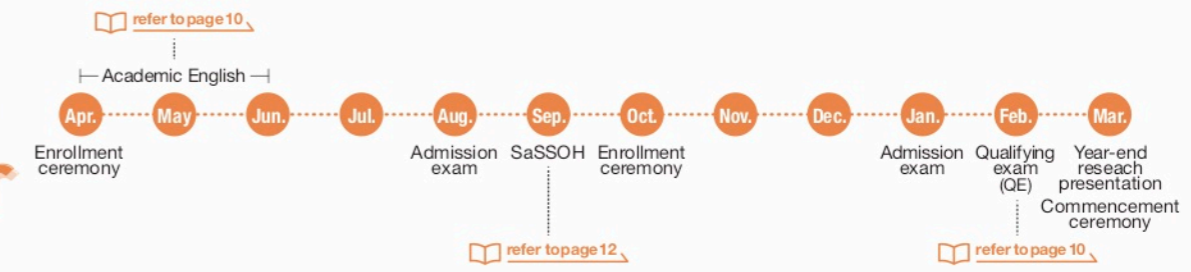
This system aims to support graduate students' learning and career paths. Faculty mentors and senior graduate students (student mentors) create learning mentor teams to provide support in learning and campus life. Experienced seniors serve as senior mentors to provide advice on graduate students' career paths and life plans, strengthening the career path support. The provision of an opportunity to interact with senior mentors broadens students' perspective and helps produce experts in other fields.

## Research advisor system

This system helps students to receive detailed guidance and advice for writing a dissertation beyond their affiliate laboratories. In addition to guidance at the affiliate laboratory, faculty members in other laboratories have close discussions as research advisors. This system beyond the boundaries of laboratories is used to promote research.



## Campus Calendar



## Admission information

The One Health Frontier Graduate School of Excellence Program is a doctoral program (four years), and the admission limit is 20 people. Of successful applicants of the Graduate School of Veterinary Medicine (up to 16 people) and the Graduate School of Infectious Diseases (up to 12 people), applicants for this program will be screened through an essay, a research plan, and an interview just after admission to either graduate school.

## Admission scheme



For more information, see the website.

For the admission exam for Hokkaido University Graduate School

Graduate School of Veterinary Medicine  
<https://www.vetmed.hokudai.ac.jp/veterinarymedicine/admission/>

Graduate School of Infectious Diseases  
<https://www.infectdis.hokudai.ac.jp/admission/>

For admission to WISE program for One Health Frontier Graduate School of Excellence  
<https://onehealth.vetmed.hokudai.ac.jp/en/programs/admissions/>