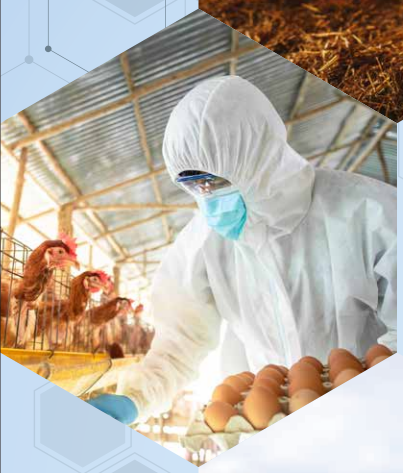





Hokkaido University Graduate School of Infectious Diseases

北海道大学大学院　国際感染症学院

4-year interdisciplinary doctoral degree program	Up to 12 students per year	In the field of infectious diseases

Campus map of Hokkaido University

Institute for Vaccine Research and Development

Faculty of Veterinary Medicine

Institute for Genetic Medicine

International Institute for Zoonosis Control

Access

Other domestic airports — Domestic Flight

New Chitose Airport — Direct International Flight

Airport bus 60 min | Taxi 50 min | JR Line (Airport train) 40 min

Sapporo Station (JR and Subway)

Subway (Namboku Line) 6 min

Kita Juhachi Jo Station

Walk 15min

Taxi 6 min

Graduate School of Infectious Diseases, Hokkaido University
Faculty of Veterinary Medicine, International Institute for Zoonosis Control, Institute for Genetic Medicine, The Institute for Vaccine Research and Development

Access guide

By JR line:
Get off at Sapporo Station.
7 min walk to the Main Gate

By Sapporo Subway:
Get off at Kita Juhachi Jo Station.
7 min walk to North 18 Gate.

Message

Already in the 21st century, emerging and reemerging infectious diseases such as Ebola virus infection, Zika virus infection and pandemic influenza have occurred in many parts of the world. Furthermore, the COVID-19 pandemic represents a great threat to humankind and poses myriad challenges for disease control. To combat these zoonoses, international collaboration is required to train specialists who lead the countermeasures. To overcome infectious diseases in public and animal health, basic research is required on pathogens, ecology, and host immune response. Applied research on diagnostics, preventive measures and curative medicine are also necessary. Furthermore, extensive knowledge and expertise on the prediction of infectious diseases, risk assessment, management and international health administration must also be developed.

To fulfil these social demands, Hokkaido University has established an international collaboration center for zoonosis control using the Global COE Program as well as Fostering Global Leaders in Veterinary Science toward Contributing to "One Health" (academic year 2011 - 2017). In the Program for Leading Graduate Schools, and the World-Leading Innovative and Smart Education Program, the university reformed graduate education to produce experts in veterinary science who can play a leading role on a global stage under the concept of One Health, and has strengthened schooling for developing an interdisciplinary vision and promoted graduate education involving practical international activities. In April 2017, the Graduate Schools of Infectious Diseases and Veterinary Medicine were restructured to strengthen the above initiatives to further

specialize, internationalize and promote interdisciplinary graduate education in infectious disease science and veterinary medicine. To this end, the Graduate School of Infectious Diseases builds a cross-disciplinary educational system with the participation of a variety of teaching staff in medicine, veterinary medicine, pharmaceutical science, chemistry, agriculture, and bioinformatics, uses a joint research network comprised of more than 30 countries across the world, and fosters individuals capable of playing a leading role in zoonosis control.

Education policy

As was seen in the COVID-19 pandemic and Ebola hemorrhagic fever outbreaks, the threat of emerging and re-emerging infectious diseases to human society and economy has been increasing at an alarming rate. Accordingly, there has been a corresponding increase in the demand for specialists who deal with infectious disease research and its control. To satisfy this need, the Graduate School of Infectious Diseases pursues the mission to develop human resources who have a wide knowledge of infectious diseases, flexible imagination and comprehensive decision-making ability to contribute to the development of infectious disease research and education as well as infectious disease control around the world with practical ability and leadership.

Curriculum of Graduate School of Infectious Diseases (All are held in English)

1st year

Subjects on Fundamental Veterinary Science or Infectious Diseases

Learn basic knowledge on infectious diseases and veterinary medicine essential for implementation of doctoral thesis study, including Biostatistics, Information Science, Immunology, Parasitology, Veterinary Public Health, Microbiology, Veterinary Hygiene, and practice on cutting-edge analytical machines.

Research Ethics Seminar

Learn ethics for research activities, conference presentations and manuscript writing. Learn compliance and ethics for experimentation involving animals, genetically-modified organisms, pathogen-handling, and human sample-handling.

Academic English

Improve academic English ability required to be a global actor in international activities.

1st advisory session

Confirm and guide to target degree

2nd year

Advanced and Comprehensive Studies on Zoonosis Control

Learn broad and deep expertise on zoonosis and its pathogens, and knowledge on management and implementation of zoonosis control.

Core Subjects on Infectious Diseases Ⅰ

Learn high expertise and skills on infectious diseases including Pathogen Genomics, Zoonosis Control and Biological Defense.

3rd and 4th year

Epidemiological study at HUCZCZ in Zambia

Internship at WHO Western Pacific Office

[Core Subjects on Infectious Diseases ⅡA]

Learn practical expertise for infectious disease control including Risk Analysis, Global Health, Mathematical Biology of infectious diseases.

[Internships Abroad A]

To train practical skills for international activity, conduct internship at international organizations such as WHO, governmental bodies in public and animal health, or international branches of companies.

[Research on Infectious Diseases ⅡA]

Study on infectious diseases especially in the spread of emerging and re-emerging disease, risk analysis, and preventive measures. The study is summarized as doctoral thesis.

2nd advisory session

3rd advisory session

[Core Subjects on Infectious Diseases ⅡB]

Learn practical expertise for infectious disease control in veterinary medicine including Pathology of Infectious Disease, Transboundary Disease and Pharmaceutical Development.

[Internships Abroad B]

To train practical skills for international activity, conduct an internship in the field abroad (disease outbreak), FAO, World Organization of Animal Health (WOAH), another veterinary school, or in the commercial sector.

[Research on Infectious Diseases ⅡB]

Study on infectious diseases in animals and its pathogens especially analysis of transmission route and its management, and molecular basis of biological responses against infection. The study is summarized as doctoral thesis.

Zoonosis Control Expert Certify Examination

Thesis defense

Degree conferment

Ph.D. degree of Infectious Disease or Veterinary is conferred based on study expertise

- ▶ **Ph.D.in Infectious Diseases/ZCE**
- ▶ **Ph.D.in Veterinary Medicine/ZCE**

Research on Infectious Diseases Ⅰ

Learn knowledge and skills required for making research plan, data collection and research activities. Implement the research based on the plan and report its procedure regularly to a main supervisor and research advisors.

Advanced Seminar on Infectious Diseases

Regular seminars within the laboratory to update the information and trends in the research filed. In seminar, provide an explanation of a review or research paper related to your research theme. Learn background, methodology, data analysis and interpretation of the research outcomes through the seminar, and understand the topics in the research field more deeply.

[Program of Zoonosis Control Expert]

This is certified by Hokkaido University to educate specialists who investigate the prediction or prevention of zoonosis and reveal pathogens' ecology, and can participate the disease control in infectious disease outbreaks.

Curriculum Policy

Broad academic foundation

- Interdisciplinary perspectives
- Comprehensive, interdisciplinary knowledge
- Internationally recognized ethics and standards

Comprehensive research skills

- Research advisor system to support doctoral dissertation
- Yearly Quality Evaluation to support dissertation progress

English proficiency

- Small class sizes for presentation and discussion skills
- All lectures in English
- English seminars featuring researchers invited from abroad who are at the forefront of their fields

Practical ability

- Opportunities to get real-world experience
- Exploring career paths in an international context

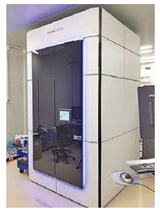
Advanced specialist expertise

- Core subjects which are aimed at providing advanced specialist expertise in infectious diseases
- Recommendation to acquire specialized knowledge and skills in related fields

Broad-ranging abilities as Ph.D. holders

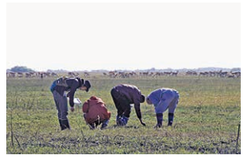
- Training in the planning and organization of academic events, research forums and international academic conferences
- Opportunity as educators through Teaching Assistants

Research Institutions and facilities

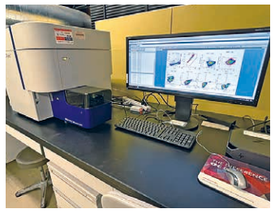


Cryo-electron microscopy (cryo-EM) is able to observe hydrated biomolecules by operating at liquid nitrogen temperatures. In 2021, the first cryo-EM for BSL3 pathogens in the world has installed in P3 area of International Institute for Zoonosis Control by designing a liquid nitrogen supply and sample transfer system. After the sterilization tests for a year, an energy filter was also equipped and operation has started.

Experiments using BSL3 pathogens including animal infection and P3-level recombinant experiments can be performed in the P3 facility of International Institute for Zoonosis Control. P3 laboratory area (6 laboratories), P3 animal area (3 laboratories), and P3 cryo-electron microscope area (preparation room and laboratory) are available. Atmosphere in laboratories is individually controlled and maintained at a negative pressure (-30 to -40 Pa).



Established in 2007 at the School of Veterinary Medicine, University of Zambia, **Hokudai Center for Zoonosis Control in Zambia (HUCZCZ)** fosters strong collaborations between Japan and Zambia to conduct research and human resource development for zoonosis control. Since its inception, HUCZCZ has hosted resident staff of Hokkaido University and offered advanced research facilities including a BSL3 laboratory and next generation sequencers. As a robust hub, HUCZCZ supports researchers and students from Japan, Zambia, and worldwide in their activity.

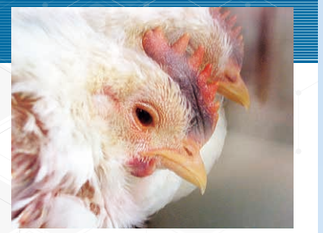


Flow cytometer is an instrument that simultaneously detects multiple proteins labeled with fluorescent markers in cells at very high speed (more than 10,000 cells per second). It is also possible to isolate the labeled cell population of interest. Any type of cells can be analyzed with this instrument, thus making it useful for a wide range of research fields including cell biology, immunology, hematology, oncology, clinical diagnostics, pharmaceutical development.

01 Laboratory of Microbiology

“Protect animals and humans from threat”

To prevent and control animals as well as humans from infectious diseases, collaborative researches with domestic and international research groups were proceeded especially in ecology and selection of pathogens, identification of molecular basis in pathogenesis in hosts, and development of preventive and reactive control measures. Based on the findings in the research about zoonotic influenza, pestivirus infection, and animal experiments in ABSL-3 facility, fundamental researches in establishment of new diagnostic methods for viral infections, development of new vaccines, and application of human medicines to other animals are ongoing. For zoonotic influenza which can cause diseases in multiple animals, key molecular factors in viruses and hosts to enable viruses to transmit many animal species are investigated. Expansion of viral transmission among animals is spatially and temporally analyzed and estimated to understand the dynamics of viral infection in the field.



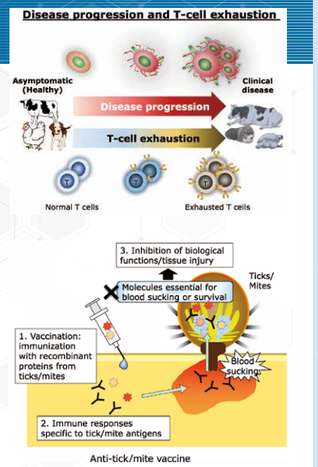
02 Laboratory of Infectious Diseases

“Survival strategies of pathogens and tumors: Toward overcoming intractable diseases”

The invention of drugs and vaccines has enabled the treatment and prevention of several diseases. However, many intractable diseases remain among the greatest health concerns in the world, as microbes and neoplasms develop various strategies to evade the host immune system, resulting in the onset of diseases. In the veterinary field, the development of effective treatment strategies has contributed to overcoming many diseases, but threats still exist in several refractory diseases. For these reasons, our research focuses on the systematic analysis of the pathogenesis of infectious and neoplastic diseases in animals, as well as the establishment of therapeutic strategies for them.

(1)Development of novel treatments for intractable diseases in animals: We are investigating immunotherapies using immune checkpoint inhibitors, such as anti-PD-L1 antibodies.

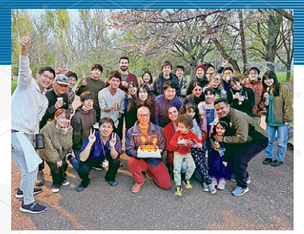
(2)Development of anti-tick/mite vaccine: We are currently working on the development of preventive strategies of these ectoparasites by vaccination.

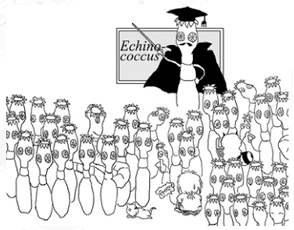


03 Laboratory of Parasitology

“Be ambitious on parasites!”

Parasitism is a phenomenon in which a creature depends on another creature for shelter, nutrition, and other things necessary for its own life. In order for one creature to become a parasite, it needs another creature as host, which leads to a competitive relationship between the two. Because there are so many different kinds of organisms that live as parasites and so many different kinds of organisms that are parasitized, the interrelationships that these organisms create (host-parasite relationships) are extremely complex and diverse. Through our research activities on parasites, we hope to answer the question, “How should we deal with parasitic infections?” We carry out research in a wide range of areas, including field studies to collect and characterize parasites and basic studies to understand the mechanisms of parasitism. In collaboration with other experts and field personnel we aim to contribute to the prevention and control of parasitic zoonoses such as echinococcosis and tick-borne infectious diseases.

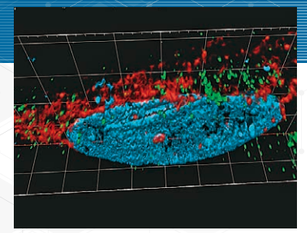




04 Laboratory of Public Health

“Viral zoonosis control”

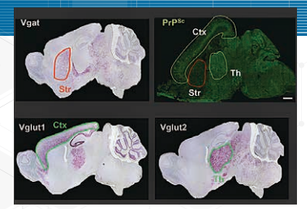
Our research focus on hantavirus and flavivirus, which are viral zoonotic pathogens. By isolating hantavirus, which are viral zoonotic pathogens. By isolating hantavirus, which cause severe pneumonia and nephritis in human, from wild rodents in Hokkaido, we have tried to elucidate the mechanisms of hantavirus persistence in nature and viral multiplication, and develop pathological animal models. Flavivirus, which are reported hundreds of millions of human infection annually worldwide, have been researched using West Nile virus and tick-borne encephalitis virus as mechanisms of intracellular replication and pathogenesis including cell death.
Recently, we are trying to conduct research combining viral infection and imaging techniques using the technology to create recombinant viruses from genetic information, which has been continuously developed in our laboratory. For the control of viral zoonosis, cells infected with the recombinant viruses are examined spatio-temporally using confocal microscopy and electron microscopy.

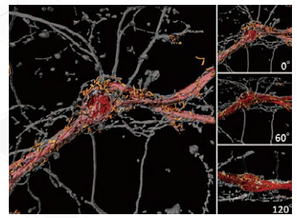


05 Laboratory of Veterinary Hygiene

“Exploring Scientific Curiosity”

In our laboratory, we conduct international research and collaboration in three areas: 1) Prion diseases and neurodegenerative disorders, 2) Antimicrobial-resistant bacteria, and 3) Foodborne infectious diseases. Prion diseases, including bovine spongiform encephalopathy (BSE) and Creutzfeldt-Jakob disease (CJD) in humans, are fatal neurodegenerative disorders without current treatment options. We focus on understanding the pathogenesis and neurodegenerative mechanisms of prion diseases, analyzing the involvement of microglia and astrocytes, and monitoring animal prion diseases. Addressing the global concern of antimicrobial-resistant bacteria, our studies encompass characteristics and transmission patterns of antibiotic-resistant bacteria in both animals and humans, and also develop new therapeutics. Additionally, we engage in international cooperation and research initiatives such as the JICA Technical Cooperation Project in Mongolia, with the objective of investigating and improving food safety. These studies based on One Health Approach enhance the comprehension and prevention of these diseases.

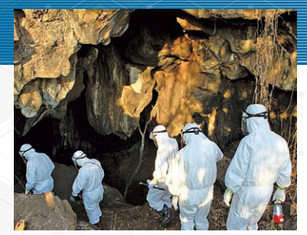




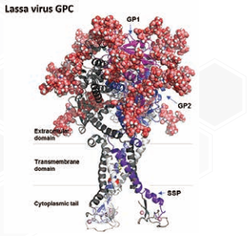
06 Division of Global Epidemiology

“Virus *iro-iro*, research *iro-iro*: Diversifying virus research”

Viral zoonoses are mostly caused by transmission of causative pathogens from their natural host animals to humans. Some viruses such as Ebola virus, Marburg virus, and Lassa virus cause severe diseases with high mortality rates in humans. Some strains of influenza viruses are also highly pathogenic to both avian and mammalian hosts. The Division of Global Epidemiology conducts scientific research on such highly pathogenic viruses, covering a wide range of studies from ecology of viruses in Africa and Asia to molecular biology of viral pathogenicity and host range. Other basic researches are also conducted for the development of rapid diagnostic tests and antiviral therapeutics. Our laboratory aims to bring new insights to virus research by actively utilizing computer analyses such as protein structure simulation and machine learning in addition to virological and molecular biological approaches.



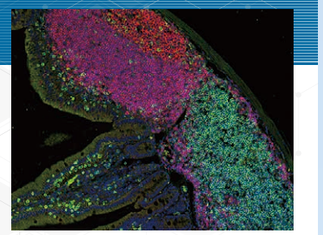
Lassa virus GPC



07 Division of Molecular Pathobiology

“Open new frontiers in viral pathogenesis”

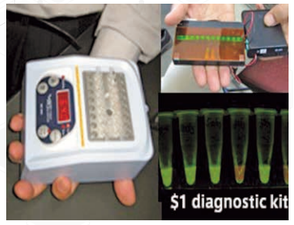
Viral zoonoses are a global public health concern and threat our social activities. Our research focuses on a wide range of zoonotic viruses, especially mosquito-borne viruses, rabies virus, SARS-CoV-2, and novel viruses isolated from wild animals. To control these viral zoonoses, it is essential to understand the viral pathogenesis including the mechanisms of virus entry/replication in cells, host responses to the infection, and disease development. Our research approach is based on molecular biology, pathology and the latest research methods such as genomics, bioimaging and omics. We expand our research interest in the transmission routes and life cycles of viruses in nature. Our field studies have identified various viruses from mosquitoes, bats, rodents and non-human primates, highlighting extensive diversity and potential zoonotic risk of viruses in wildlife. Through these research activities, PhD students develop attitudes and skills to investigate infectious disease from both micro and macro perspectives.



08 Division of Bioresources

“Towards the control of bacterial zoonoses”

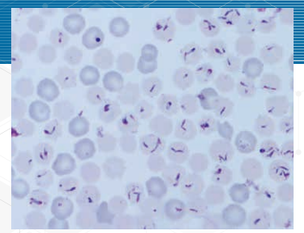
In collaboration with researchers in Asian and African countries, we are investigating zoonotic diseases caused by bacteria such as *Mycobacterium tuberculosis*, *Salmonella sp.*, and *Staphylococcus sp.* to clarify the situation in each country and how these bacteria acquire resistance to antimicrobial agents. The genomic information obtained from the surveys is used to develop simple, low cost, and rapid diagnostic methods and drug susceptibility testing methods. We are also conducting international collaborative research with the aim of implementing the developed methods in the field of infectious disease outbreaks. In addition, we are screening various compounds to develop effective drugs against bacteria that show resistance to antimicrobial agents. In addition to these efforts, we are developing biologics such as humanized antibodies by utilizing our original recombinant protein mass expression system using mammalian cells as hosts.



09 Division of Collaboration and Education

“From field to genomics”

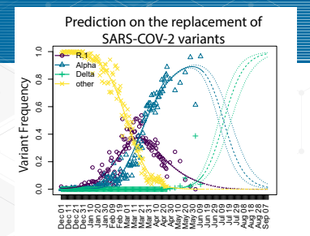
Protozoan diseases such as toxoplasmosis, trypanosomiasis, babesiosis, and leishmaniasis are still major public health problems in both humans and animals. To control them, we promote innovative infectious disease research integrating field epidemiology, molecular biology, and genomics. Besides, we do our research not only in the laboratory but also with our collaborators and graduates who are active in endemic areas such as Zambia, Indonesia, Thailand, and Vietnam. In doing so, we establish expertise in the latest analytical technology called next-generation sequencing as one of the core competencies. At the same time, we are developing novel diagnostic methods to detect parasites, fungi, bacteria, and viruses in the clinical specimens. Collectively, they will enable us to understand parasitic phenomena in nature and to realize social implementation of our diagnostic methods. Through those activities, we hope to achieve control of infectious diseases.

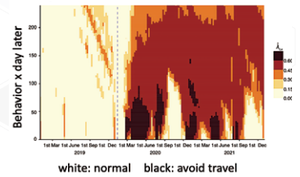


10 Division of Bioinformatics

“Epidemiological and evolutionary dynamics of pathogens”

The mission of Division of Bioinformatics is to contribute to the control of infectious diseases in humans and animals through computational data analyses. We construct mathematical models describing epidemiological dynamics of infectious diseases and evolutionary dynamics of pathogens. Data associated with infectious diseases and pathogens are statistically analyzed based on the developed models. Results of analyses are interpreted so that we can derive the implications for the infectious diseases control. We use epidemiological data of infectious disease and genome data of pathogens, as well as data on host behavior and host genome. Our studies use methodologies developed in different research areas including artificial intelligence, bioinformatics, computer science, dynamical systems, epidemiology, machine learning, mathematical modeling, population genetics, phylogenetics, phylodynamics, statistical models, and systems biology. Infectious diseases targeted in our recent studies include influenza, COVID-19, HIV/AIDS, classical swine fever, rubella, and rabies.





11 Division of Infection and Immunity

“To control bacterial infection”

The Division of Infection and Immunity conducts research aimed at the prevention and control of bacterial infections through:

- Development of preventive and therapeutic methods based on structural information of pathogenic factors,
- Research on mechanisms of bacterial virulence and
- Surveillance in risk areas for emerging and reemerging infectious diseases

We research the pathogenic mechanisms of *Bacillus* species, including *Bacillus anthracis*, using protein engineering, molecular biology, and other techniques. Furthermore, we are conducting epidemiological studies to understand the actual situation at scenes of infectious disease outbreaks. Our goal is to contribute to the prevention and control of zoonotic diseases through understanding of bacterial infections from the micro to the macro level.

12 Division of Risk Analysis and Management

“Revealing risk of infectious diseases”

Only a part of infectious diseases that actually occur has been recognized. A wide variety of microorganisms, including viruses, in environment, are threatening our public health. We aim to discover previously unknown viruses and microorganisms in the environment in advance to their emergences and elucidate their geographical distribution and biological characteristics to assess the risks. We also aim to discover previously unknown infectious diseases in collaboration with physicians and veterinarians, for identification of pathogens and clarifying the infection dynamics in order to reveal their risks. In particular, tick-borne infectious diseases emerge sporadically, and their risk is often overlooked. For this reason, we focuses on the research on tick-borne microorganisms and the processes by which they are maintained and spread in the environment. We use a variety of methods, ranging from field surveys to genetic analysis, to uncover the realities of infectious diseases.

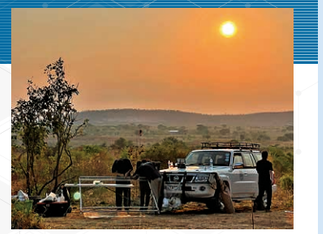
13 | Division of Biologics Development

“Pursuing the ideal vaccine”

Since 2000, numerous outbreaks of emerging and re-emerging infectious diseases such as pandemic H1N1 influenza, highly pathogenic avian influenza, coronavirus diseases (SARS, MERS, COVID-19), Ebola virus disease, Zika virus disease, and monkeypox have been threatening the world, and unknown infectious diseases will likely continue to emerge in the future. The key to win this endless battles between humanity and infectious diseases is the VACCINE. Ideal vaccine should effectively enhance immunity in naive population, be available to young children, and be free of strong adverse reactions such as high fevers. However, many of the current vaccines have not met the criteria.
Our laboratory has been working on the practical application of an influenza vaccine that is highly effective while minimizing the adverse reactions. We are also using this knowledge to develop vaccines against various infectious diseases, including COVID-19. Would you be interested in creating the ideal vaccine to end this battle? Come and join us!

14 | Division of International Research Promotion

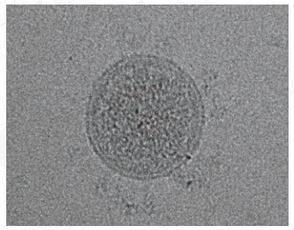
“No border, just be a spearhead for One Health”



Infectious diseases know no borders. In today’s interconnected world, the control of infectious diseases is a global responsibility that transcends national boundaries. The Division of International Research Promotion takes a global perspective in its study of infectious diseases, breaking free from the constraints of borders. We are instrumental in operating the Hokudai Center for Zoonosis Control in Zambia and conducting comprehensive pathogen screening among bats, ticks, livestock, and more, primarily in Africa, including Zambia and the Democratic Republic of the Congo. Our research has identified numerous known and potential novel zoonotic pathogens. While we maintain respect for classical microbiology, we boldly employ innovative techniques, such as satellite-based host animal tracking, to uncover the ecological dynamics and transmission routes of zoonotic pathogens to human society. Our motto is ‘Proactive research’ against zoonotic diseases, and we are committed to advancing the One Health initiative on a global scale.

15 | Division of Pathogen Structure

“Understand virus construction”



This division was newly established in 2019. Traditionally, X-ray crystal structure analysis has been mainly used for structural analysis of biomolecules, especially proteins. However, crystallization requires large amount of samples, trials, and time. The cryo-electron microscopy (cryo-EM), developed in the 2000s, has largely overcome the above problems. Now, it’s a game changer in this field. During the pandemic of SARS-CoV-2 in 2019, cryo-EM significantly contributed to determine the structure of viral components. The 300 kV cryo-EM introduced to our institute is the only equipment in the world that can directly observe BSL3 pathogens, and our division utilize it to clarify the pathogen structures of emerging infectious diseases. These data will lead to the elucidation of host recognition mechanisms by pathogens and the rational design of vaccines or therapeutic drugs. Currently, we are primarily focused on the SARS-CoV-2, but we will also expand our research to influenza viruses and paramyxoviruses.

16 | Institute for Genetic Medicine

“Rodent-borne zoonotic diseases”

Our research interests are rodent–borne zoonotic pathogens such as hantaviruses, bunyaviruses, leptospiras, and others. Especially, I focus on hantaviruses. One of the challenges we are working on is chronic kidney disease of unknown etiology (CKDu) in Sri Lanka. The disease causes death on average five years after diagnosis and is the leading cause of death among adults in endemic areas. My research group firstly reported that about half of the CKDu patients were hantavirus antibody-positive, meaning they had a history of infection. After searching rodent hosts and viruses, it was found that infection with Lanka virus, a novel hantavirus carried by Mus booduga, is a risk of CKDu, and that the acute stage of human infection might be asymptomatic or common full-like disease. However, the distribution of the Lanka virus, transmission route, the mechanism leading to onset, and the relationship with CKDu in other countries, India, and Middle American countries are still unknown. I and collaborators are currently working on these issues.

17 | Institute for Vaccine Research and Development (IVReD)

“Protecting people from pandemics”

The Institute for Vaccine Research and Development (IVReD) was established in October 2022 at the Creative Research Institution, Hokkaido university. IVReD was selected as a synergy center along with the University of Tokyo (flagship center), Osaka University, Chiba University, and Nagasaki University (synergy centers) by the Japan Agency for Medical Research and Development (AMED)'s "Japan Initiative for World-leading Vaccine Research and Development Centers" projects.
We will prepare a library of pathogens, causing infectious diseases in humans, promote basic research for vaccine development, and attempt to develop vaccines and implement them in society in collaboration with institutions, companies, and universities. In addition, we will contribute to the "rapid development and production system for Japanese vaccines" in outbreak of infection diseases by flexible response. All to protect people from pandemics.

Training Program of Zoonosis Control Expert

To prevent human and animals from zoonosis and to protect society from anxiety and economic loss, it is necessary to educate human resources with expertise and skills in each infectious disease who can tackle disease control with an understanding of the international challenges this entails.
The Graduate School of Infectious Diseases provides the course Zoonosis Control Expert, which ventures beyond the research topics of each student. The school educates students to possess the expertise of zoonoses and their pathogens which cause global challenges, to understand practical applications for zoonosis control, and to take a lead in management of infectious diseases, education and research at the global level.

Overseas activities of Ph.D. course students (AY2022)

Learn Antibody Therapy Technique (Sweden)

I did an internship at the Laboratory of Genetics and Pathology, Department of Immunology, Uppsala University, Sweden for four weeks to learn industry-academia collaborative research.
Specifically, I learned protein detection assay methods (PLA-RCA, sp PLA, PEA), which were developed by the laboratory. Since these assays were at high versatility and higher sensitivity than those in my original laboratory, I could overcome challenges I previously could not solve due to low sensitivity in protein detection. I could help my colleagues by sharing the obtained knowledge and experiments through this internship.

Study on food-borne disease (Mongolia)

Int. Conference (Australia)

Field study of bat (Zambia)

Investigation of bat ecology (Peru)

Bats are reservoirs of a various zoonoses, and need to be captured for investigation. However, some bat species are endangered and might suffer from capture.
To learn methods of studying bat ecology with reduced burden, I participated a field investigation with capture targeting small-colony bat species at a tropical rain forest in Peru.
It was a great experience for me to consider bat-derived zoonosis from the view of ecology. It raised questions like whether it is less likely that viruses could be maintained in small-colony bat species compared to large-colony species, or how do various ecologies affect reservoir potentials.

Jobs after Graduation

- International organizations, World Health Organization, World Organization for Animal Health
- Higher education institutes (e.g. Universities), universities in Japan and abroad
- Private companies, pharmaceutical companies, food companies, collaborative research partners
- Domestic public sectors, ministries, Domestic research agencies, National Institute of Infectious Diseases, Japan International Cooperation Agency

General Affairs, Faculty of Veterinary Medicine, Hokkaido University

Kita 18, Nishi 9, Kita-ku, Sapporo, Hokkaido 060-0818, JAPAN
syomu@vetmed.hokudai.ac.jp　TEL: 011-706-5173 / FAX: 011-706-5190