



TRAINING AND DIALOGUE PROGRAMS

GENERAL INFORMATION ON

ADVANCED RESEARCH COURSE
ON INTERNATIONAL ANIMAL HEALTH

集團研修「国際獣疫対策上級専門家育成」

JFY 2010

<Type: Leaders Training Program / 中核人材育成型>

NO. J10-00620 / ID. 1080920

From August, 2010 to August, 2011

Phases in Japan: From October 24, 2010 to August 27, 2011

This information pertains to one of the Training and Dialogue Programs of the Japan International Cooperation Agency (JICA), which shall be implemented as part of the Official Development Assistance of the Government of Japan based on bilateral agreement between both the Governments of recipient country and Japan.

I. Concept

Background

By the middle of the 21st century, the world's population is expected to reach nine billion, which is one and a half times the current level. In order to secure stable animal protein supplies in the future, newly emerging and developing countries in particular must find immediate breakthroughs to escape the current situation in which food production is often hindered by infectious diseases among domestic animals. In developing countries, training of experts who can implement infectious disease control through cooperation with the international community is an immediate priority. The G8 Hokkaido Toyako Summit Leaders Declaration of 2008 also emphasized the commitment of the heads of nations involved to enhancing levels of support for human resource strengthening in developing countries in order to bring about the introduction of diagnostic techniques for malaria and other infectious diseases, promote R&D on vaccines and therapeutic drugs and solve public health issues. The World Organisation for Animal Health (OIE – an intergovernmental organization with 176 member countries aiming to ensure the safety and security of domestic animals and livestock products) recognizes leading-edge infectious disease research organizations as collaborating centers. The OIE uses research results provided by these organizations to develop new diagnostic approaches to infectious diseases and establish international standards for vaccination. In recent years, the OIE has also emphasized the contributions that collaborating centers make to developing countries in order to improve diagnostic approaches to infectious diseases and enhance levels of public health in developing countries. In this regard, Obihiro University of Agriculture and Veterinary Medicine's National Research Center for Protozoan Diseases became Asia's first OIE collaborating center in May 2008, and is expected to make a significant contribution to the field.

Prior to this program, a group training program called "Advanced Studies on Protozoan Diseases" was implemented for a period of 10 years from 1995 to provide expertise and information on technologies concerning protozoan disease control. From 2005, another training program entitled "Advanced Research Course on Control of Zoonosis for Food Safety" was also implemented for five years to provide expertise and information on technologies related to infectious diseases, including non-protozoan infectious diseases such as bovine spongiform encephalopathy (BSE) and avian influenza. This "Advanced Research Course on International Animal Health" is designed to let experts to gain advanced knowledge and understand technologies in fields considered essential to acquiring an international perspective in addition to those covered by the preceding training courses.

For what?

This program is designed for experts who deal with control of globally important infectious diseases to acquire advanced technology and forefront knowledge, including global animal health, public health, zoonoses and epidemiology.

For whom?

This program is offered to lecturers of universities/colleges, researchers of national/public institutes, and/or technicians of administrative agencies.

How?

This program provides the participants with intensive research training in the different research units of the National Research Center for Protozoan Diseases, and the Research Center for Animal Health and Food Safety. Participants are expected to be a member of the unit, and acquire advanced technologies about diagnostic, therapeutics, prevention and host immune responses on the theme which participant selected, through cooperative research with instructor.

II. Description

1. **Title (J-No.):** Advanced Research Course on International Animal Health (J10-00620)

2. **Period of program**

Duration of whole program: August, 2010 to August, 2011

Preliminary Phase: August to September, 2010
(in a participant's home country)

Core Phase in Japan: October 24, 2010 to August 27, 2011

3. **Target Regions or Countries**

Thailand, Mongolia, Zambia, Argentina, Iraq (2)

4. **Eligible / Target Organization**

University, College, administrative agency, National institute engaged in Animal Health

5. **Total Number of Participants**

6 participants

6. **Language to be used in this program:** English

7. **Program Objective:**

To improve the disease preventive, diagnostic and therapeutic techniques, and relating practical knowledge of experts who deal with control of globally important zoonoses.

8. **Overall Goal**

To improve quality of the disease preventive, diagnostic and therapeutic techniques of experts who deal with control of globally important infectious diseases in developing countries.

9. Expected Module Output and Contents:

This program consists of the following components:

(1) Preliminary Phase in a participant's home country (August to September, 2010) <i>Participating organizations make required preparation for the Program in the respective countries.</i>	
Expected Module Output	Activities
Inception Report is formulated	Formulation and submission of the Inception Report

(2) Core Phase in Japan (October 24, 2010 to August 27, 2011) <i>Participants dispatched by the organizations attend the Program implemented in Japan.</i>		
Expected Module Output	Subjects/Agendas	Methodology
Objective 1: To be able to explain an outline of globally important infectious diseases concerning their pathogen, pathology, prevention, diagnosis, therapy and epidemiology.	Lectures on major infectious diseases - Recent outbreaks of protozoan diseases (e.g., malaria, trypanosomiasis and babesiosis) and their arthropod vectors, bacterial diseases (anthrax), viral diseases (avian influenza), BSE, etc., and basic information/technologies relating to diagnosis, prevention, etc. - Case studies on the prevalence of infectious diseases, including basic information/technologies regarding pathologies, clinical conditions and the latest standard therapeutic techniques for these conditions - Case studies based on the lectures above	- Class-room lectures on globally important infectious diseases. - Case studies on globally important infectious diseases.
Objective 2: To be able to perform internationally standard diagnostic techniques for globally important infectious diseases.	Lectures on international standard diagnostic techniques - Genetic diagnosis technologies, such as PCR and LAMP, for protozoan diseases and viral infections - Serological/molecular diagnosis of harmful microbes in food - Morphological and molecular taxonomical technologies for arthropods as protozoan disease vectors - Laboratory practice on international-standard diagnostic techniques - Laboratory practice based on the lectures above	- Class-room lectures on the diagnostic techniques for globally important infectious diseases. - Laboratory practice on the international standard diagnostic techniques for globally important infectious diseases.

<p>Objective 3: To be able to apply the disease preventive, diagnostic and therapeutic techniques for particularly important infectious diseases in the participant's country.</p>	<p>Study/investigation of preventive, diagnostic and therapeutic techniques for infectious diseases, and analysis/reporting of results (mid-term report presentation)</p> <ul style="list-style-type: none"> - Study of preventive, diagnostic and therapeutic techniques for specific infectious diseases applicable to participants' countries, development of their application and acquisition of related technologies (research with a possibility of submission to international academic journals) - Advice, technical guidance, etc. on presentations (mid-term report presentation) 	<ul style="list-style-type: none"> - Carry out laboratory-based study/investigation on the disease preventive, diagnostic and therapeutic techniques. - Perform analysis and reporting the outcomes (midterm-report).
<p>Objective 4: To be able to explain an outline of the disease control measures, concerning international cooperation and community-based practice.</p>	<p>Lectures on matters related to infectious disease control measures</p> <ul style="list-style-type: none"> - Countermeasures by and trends among international organizations such as WHO and FAO - Countermeasures by the OIE (e.g., survey on disease outbreaks around the world, establishment of international standards concerning livestock product trading and international quarantine, and international standardization of new diagnostic techniques and vaccination) - Countermeasures to fight infectious diseases in Japan and other countries, efforts to fight infectious diseases through public participation, etc. <p>Case studies on infectious disease control measures</p> <ul style="list-style-type: none"> - Case studies based on the lectures above <p>Visits to domestic and international infectious disease control institutions</p> <ul style="list-style-type: none"> - National Institute of Infectious Diseases; Research Institute for Microbial Diseases, Osaka University; Institute of Tropical Medicine, Nagasaki University; Animal Quarantine Service, etc. 	<ul style="list-style-type: none"> - Class-room lectures on the disease control measures. - Case studies on the disease control measures. - A study trip to observe domestic facilities/institutions for the disease control measures.

<p>Objective 5: To be able to explain the outcomes from research/investigation in Output (3), concerning international cooperation and community-based practice in Output</p>	<p>Final reporting on research/investigation outcomes (final presentation) - Presentations and discussions on implementation plans for infectious disease control measures in participants' countries focusing on cooperation with the international community - Examination as a diploma certification test</p> <p>Final comprehensive test (written examination) - International standard expertise and technologies, practical implementation of technologies and levels of mastery in fields considered essential in acquiring an international perspective are examined by way of a written examination. - Examination as a diploma certification test</p>	<p>- Final reporting (oral examination). - Final comprehensive test (written examination).</p>
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This program mainly covers the following themes. After lectures on common subjects, all participants are attached to a suitable research laboratory in one of the following fields in accordance with the purpose and specialty of each participant:

- (1) Research unit for functional genomics
- (2) Research unit for host defense
- (3) Research unit for vector biology
- (4) Research unit for molecular diagnosis
- (5) Research unit for advanced preventive medicine
- (6) Research unit for infection and pathology
- (7) Food-borne bacterial diseases
- (8) Emerging and re-emerging viral diseases

This program consists of the following components. Each participant is assigned to one of the following eight research units. **Basically each unit accepts one or two participants.** To avoid congestion in one unit, the applicants are requested to indicate priority among the eight research units and topics in "Questionnaire" (see Annex) according to his/her interest, because 70-80% of 8 units is focused on protozoan and the rest percentage is for virus and bacteria. Hence the successful applicant may be advised to accept a topic other than his/her 1st choice. He/She will be informed the selected unit and its field with the acceptance information. Reprints of applicant's scientific publications and Inception Reports (see procedures: section VI) will facilitate the process of selection of a suitable research subject/topic for the participant.

Example: 1st choice.....3 (b,a)
2nd choice.....5 (c,b)
3rd choice.....1 (b,a)
4th choice.....4 (a,b)

Participants will be introduced to the fundamentals of zoonoses, protozoan/bacterial/viral diseases, food-borne diseases, treatment of experimental implements and animals, serum diagnosis, among others, during the first three weeks, and thereafter, they will be assigned to their respective units.

Seminars/special lectures are held once or twice per month. These may be delivered by a staff of the National Research Center for Protozoan Diseases and Research Center for Animal Hygiene and Food Safety, or by other prominent Japanese and foreign researchers and scientists, not directly affiliated with the Research Center. Seminars and lectures are essentially about protozoan/bacterial/viral diseases and other related fields.

Unit 1. Research unit for functional genomics

Supervisor: Hiroshi SUZUKI, Ph.D.

The aim of research projects is to focus on the immunologic analysis in innate and acquired immune mechanisms contributing to host resistance against protozoan diseases and molecular analysis of protozoan parasites. Current subjects of research are as follows:

- (1) Analysis of genetic control of responses to infection by a variety of host- or parasite-related parameters.
- (2) Immune regulation of effector function in experimental infection in mice.
- (3) Development of diagnosis for coccidian parasites, such as *Toxoplasma gondii*, *Neospora caninum*, and *Cryptosporidium* sp.

Research Subjects for JICA Participants:

- 1-a Characterization of the biological functions of lymphocytes, cytokines and antibodies.
- 1-b Molecular and epidemiological analysis of protozoan parasites.
- 1-c Experimental infection of protozoan parasites in genetically modified mice.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Cell and tissue culture ▪ Basic immunological techniques ▪ Methodology of experimental animals 	<ul style="list-style-type: none"> ▪ Culture of host cells and protozoan parasites ▪ Understanding of antigen-antibody reaction ▪ Techniques of injection and blood sampling using mice
Apr. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Diagnosis in protozoan diseases ▪ Infection experiment and immunological analysis 	<ul style="list-style-type: none"> ▪ Analysis of protective immune responses using immunological methods, such as IFAT, ELISA, Flow cytometry, Western blotting, PCR.
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 2. Research unit for host defense

Supervisors: Xuenan XUAN, DVM, Ph.D.

Yoshifumi NISHIKAWA, Ph.D.

The research projects are focused on the study of host defense mechanisms against protozoan parasite infections by using molecular biotechnologies. Current subjects of research are as follows:

- (1) Elucidation of the mechanisms of host immunity against protozoan parasite infections.
- (2) Identification and characterization of novel vaccine candidate genes from protozoan parasites.
- (3) Development of recombinant vaccines against protozoan diseases.

Research Subjects for JICA Participants:

2-a Cloning and characterization of vaccine candidate genes from *T. gondii*, *N.caninum*, and *B. gibsoni*.

2-b Development of recombinant vaccines against *T. gondii*, *N. caninum*, and *B. gibsoni* infections.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Cell and parasite culture ▪ Molecular cloning and characterization 	<ul style="list-style-type: none"> · Host cell culture and protozoan parasite culture · Gene cloning and gene expression
Apr. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Development of recombinant vaccines ▪ Evaluation of protective immunity 	<ul style="list-style-type: none"> ▪ Basic techniques for PCR (polymerase chain reaction) and ELISA (enzyme-linked immunosorbent assay) ▪ Construction and evaluation of recombinant vaccines against protozoan infections in animals
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 3. Research unit for vector biology

Supervisors: Hirotaka KANUKA, Ph.D.

Shinya FUKUMOTO, DVM, Ph.D.

The research projects are focused on the understandings host immunity and host-pathogen interactions for alternation of their ability to transmit disease-causing protozoa by genetic manipulations of both the animals and pathogens. Current subjects of research are as follows:

- (1) Genetic dissection of host resistance against infection of *Plasmodium* parasite.
- (2) Development of genetically modified mosquito, which cannot transmit any pathogens.
- (3) Exploring new molecular methods for detection of pathogens in vector mosquitoes.

Research Subjects for JICA Participants:

- 3-a Molecular genetics for vector mosquitoes, including RNA interference and transgenesis for genetic manipulation.
- 3-b Development of rapid DNA amplification methods to detect pathogens in mosquito vectors.

Months	Contents of Training	Objectives to acquire
Dec. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Basic study of approach for molecular genetics using pathogen-transmitting vectors 	<ul style="list-style-type: none"> ▪ Techniques of breeding mosquitoes ▪ RNA interference for gene-knockdown ▪ Transgenesis of mosquitoes
Apr. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Genetic dissection of host-pathogen interaction between <i>Plasmodium</i> and <i>Anopheles</i> mosquitoes 	<ul style="list-style-type: none"> ▪ Rapid DNA amplification method ▪ Elucidation of <i>Plasmodium</i> development in mosquitoes by inhibition of gene function
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 4. Research unit for molecular diagnosis

Supervisors: Ikuo IGARASHI, DVM, Ph.D.

Naoaki YOKOYAMA, DVM, Ph.D.

The objectives of this research unit are the development of rapid and accurate diagnostic methods in protozoan diseases and invasion mechanism of *Babesia* parasites into erythrocytes searching erythrocyte membrane receptor and parasite ligands. Current research activities are focused on the following topics:

- (1) Development of in vitro systems for cultivating bovine or equine *Babesia* parasites, which are essential for studying the drug sensitivity, as well as the life cycle and biochemistry of the parasites.
- (2) Molecular analysis of parasite antigens, including the identification of useful genes and production of recombinant proteins and the development of diagnostic methods, including IFAT (Indirect immunofluorescence antibody test), ELISA, and immunochromatography (ICT) for hemoprotozoan infections.
- (3) Immune mechanisms in experimental protozoan infections in mice, including the role of T cells and cytokines in protection against the parasites.

Research Subjects for JICA Participants:

- 4-a Development of diagnostic methods for protozoan infections using serological and molecular techniques.
- 4-b Study on invasion mechanism of *Babesia* parasite into erythrocytes.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Cultivation of <i>Babesia</i> parasites 	<ul style="list-style-type: none"> ▪ Culture of <i>Babesia</i> parasites in erythrocytes
Apr. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Isolation and production of parasite antigens ▪ Serological diagnosis of protozoan infection ▪ Invasion mechanism of <i>Babesia</i> parasites to erythrocytes 	<ul style="list-style-type: none"> ▪ Production of recombinant antigens by molecular technology ▪ Development of IFAT, ELISA, ICT (immunochromatography) and PCR ▪ Effect of different chemicals on <i>Babesia</i> growth
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 5. Research unit for advanced preventive medicine

Supervisors: Shin-ichiro KAWAZU, DVM, Ph.D.

Noboru INOUE, DVM, Ph.D.

Overall objective of the research unit is to develop effective control and diagnosis measures against African trypanosomosis and malaria. Current research activities are focused on:

- (1) Application of *in vitro* systems to the evaluation of sensitivity of the parasites (*Plasmodium* and African trypanosomes) to chemotherapeutic agents and the characterization of virulence-related genes/molecules.
- (2) Development of serological and molecular diagnosis methods.
- (3) Characterization of *Trypanosoma* and *Plasmodium falciparum* isolates.
- (4) Development and application of genetically modified parasite for investigation of host-parasite relationship in the parasites (*Plasmodium* and African trypanosomes).
- (5) Biology of vectorial capacity of tsetse fly.
- (6) Molecular characterization of benign *Theileria* species.

Research subjects for JICA participants:

- 5-a *In vitro* cultivation of BSFs and insect forms (procyclic forms; PCFs) of *T. brucei brucei*, *T. brucei gambiense*, *T. congolense*, *T. evansi* and *Plasmodium falciparum* for the study of culture- and DNA-based diagnoses.
- 5-b Production of recombinant proteins and their evaluation for ELISA.
- 5-c Molecular diagnosis based on PCR and LAMP (loop-mediated isothermal amplification).

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> · Trypanosome culture of BSFs and PCFs · <i>In vitro</i> culture of malaria parasite 	<ul style="list-style-type: none"> · Cultivation techniques of trypanosome and their application for diagnoses · Cultivation techniques of malaria parasite and their application for diagnoses
Feb. 2011- Aug. 2011	<ul style="list-style-type: none"> · Serological and molecular diagnoses of trypanosomosis · Serological and molecular diagnoses of malaria 	<ul style="list-style-type: none"> · Production of recombinant antigens for ELISA Diagnosis techniques based on PCR and LAMP
Aug. 2011	<ul style="list-style-type: none"> · Summary of the training and the result of research 	

Unit 6. Research unit for infection and pathology

Supervisor: Makoto IGARASHI, DVM, Ph.D.

The aim of research projects is to understand the mechanism of parasitism of infectious organisms through the basic research for further control of the diseases. Current subjects of research are as follows:

- (1) Analysis of mechanism for host cell invasion by toxoplasma parasites.
- (2) Characterization of toxoplasma derived molecules involved in cyst formation.
- (3) Development of diagnostic tools for microsporidiosis, such as *Encephalitozoon cuniculi*.

Research Subjects for JICA Participants:

- 6-a Molecular and biochemical analysis of protozoan parasites.
- 6-b Development of ELISA, PCR, and LAMP for diagnosis.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Cell and tissue culture ▪ Basic molecular and biochemical techniques ▪ Methodology of experimental animals 	<ul style="list-style-type: none"> ▪ Culture of host cells and protozoan parasites ▪ PCR, gene cloning, and Western blotting ▪ Techniques of injection and blood sampling using mice
Apr. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Antibody production in experimental animals ▪ Serological and molecular diagnoses 	<ul style="list-style-type: none"> ▪ Recombinant protein production and immunization ▪ ELISA, PCR, LAMP, IFAT
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 7. Food-borne bacterial disease

Supervisors: So-ichi MAKINO, DVM, Ph.D.
Keiko KAWAMOTO, DVM, Ph.D.
Hisao KURAZONO, DVM, Ph.D.

Our research interests include the genetics, pathogenesis, and epidemiology of food-borne bacterial pathogens, including *Salmonella* species, *Escherichia coli*, *Listeria monocytogenes*, *Clostridium botulinum*, and *Bacillus anthracis*. Current research activities are focused on:

- (1) Physiology and molecular genetics of viable but non-culturable bacteria.
- (2) Host factor that influences the susceptibility to food-borne diseases.
- (3) Evaluation of risk assessment of *C. botulinum* contamination in low-acid, canned Foods.

Research Subjects for JICA Participants:

- 7-a Genetics, pathogenesis, and epidemiology of food-borne bacterial pathogens and the development of diagnostic, preventive and microbial risk assessment.
- 7-b Development of new drugs and vaccines to control animal infectious diseases.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Basic training used in bacteriological techniques ▪ Serological and molecular diagnosis of food-borne pathogens 	<ul style="list-style-type: none"> ▪ Cultivation or handling techniques of food-borne pathogens ▪ Diagnosis techniques based on PCR and LAMP Isolation technique of bacteria
Feb. 2011- Aug. 2011	<ul style="list-style-type: none"> ▪ Epidemiological and immunological study of bacterial diseases ▪ Study on bacterial toxins 	<ul style="list-style-type: none"> ▪ Immunological technique (Western blot analysis, ELISA, etc). ▪ Pulse field gel electrophoresis ▪ Production of recombinant antigens ▪ Functional analysis of bacterial toxins
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Unit 8. Emerging and re-emerging viral diseases

Supervisors: Kunitoshi IMAI, DVM, Ph.D.

Haruko OGAWA, DVM, Ph.D.

The research subjects are now focused mainly on viral zoonotic diseases such as avian influenza. Current research activities are as follows:

- (1) Elucidation of the occurrence factor and pathogenesis of viral infections.
- (2) Development of new rapid and accurate diagnostic methods due to molecular basis for detecting viral pathogen and its antibody.
- (3) Development of new anti-viral drugs/materials, or vaccines to prevent occurrence of viral infections.
- (4) Molecular epidemiology of avian influenza and Newcastle disease.

Research Subjects for JICA Participants:

8-a Development of diagnostic techniques due to molecular basis to detecting viral antigens, genes or antibodies.

Months	Contents of Training	Objectives to acquire
Nov. 2010- Mar. 2011	<ul style="list-style-type: none"> ▪ Basic techniques used in virological study 	<ul style="list-style-type: none"> ▪ Cultivation techniques of viruses ▪ Basic virological, serological and molecular techniques
Apr. 2011- Jul. 2011	<ul style="list-style-type: none"> ▪ Virological, serological, molecular diagnoses of viral diseases like avian influenza 	<ul style="list-style-type: none"> ▪ Development of diagnostic techniques (ELISA, latex test, flow cytometry, PCR etc.) using monoclonal antibodies, recombinant antigens, or viral genes ▪ Genetic analysis of virus isolates
Aug. 2011	<ul style="list-style-type: none"> ▪ Summary of the training and the result of research 	

Major publications

For your information, major publications by each unit are as follows:

Unit 1 (Functional Genomics)

1. Role of type I/II scavenger receptors in malarial infection in C57BL/6J mice. *Am. J. Trop. Med. Hyg.* 75, 178-181. (2006).
2. The effect of α -tocopherol transfer protein gene disruption on *Trypanosoma congolense* infection in mice. *Free Radic Biol Med.* 47, 1408-1413. (2009).
3. Vitamin C deficiency fails to protect mice from malaria. *Exp. Anim.* 59, 239-243. (2010).
4. α -tocopherol transfer protein inhibition is effective in the prevention of cerebral malaria in mice¹⁻³. *Am J Clin Nutr.* 91, 200-207. (2010).
5. α -tocopherol transfer protein disruption confers resistance to malarial infection in mice. *Malaria J.* 9, 101-112. (2010).

Unit 2 (Host Defense)

1. Proteomic analysis of calcium-dependent secretion in *Toxoplasma gondii*. *Proteomics* 7, 3718-3725. (2007).
2. A heterologous prime-boost vaccination regime using DNA and a vaccinia virus, both expressing GRA4, induced protective immunity against *Toxoplasma gondii* infection in mice. *Parasitology* 134, 1339-1346. (2007).
3. A cysteine protease is critical for *Babesia* spp transmission in *Haemaphysalis* ticks. *PLoS Pathog.* 4, e1000062. (2008).
4. Immunization with oligomannose-coated liposome-entrapped dense granule protein 7 protects dams and offspring from *Neospora caninum* infection in mice. *Clin. Vaccine Immunol.* 16, 792-797. (2009).
5. *Toxoplasma gondii* cyclophilin 18-mediated production of nitric oxide induces bradyzoite conversion in a CCR5-dependent manner. *Infect. Immun.* 77, 3686-3695. (2009).

Unit 3 (Vector Biology)

1. Rapid identification of *Plasmodium*-carrying mosquitoes using loop-mediated isothermal amplification. *Biochem. Biophys. Res. Commun.* 376, 671-676. (2008).
2. Rapid recruitment of innate immunity regulates variation of intracellular pathogen resistance in *Drosophila*. *Biochem. Biophys. Res. Commun.* 379, 6-10. (2009).
3. Rapid identification of virus-carrying mosquitoes using reverse transcription-loop-mediated isothermal amplification. *J. Virol. Methods* 156, 32-36. (2009).
4. Loop-mediated isothermal amplification applied to filarial parasites detection in the mosquito vectors: *Dirofilaria immitis* as a study model. *Parasit. Vectors.* 2, e15. (2009).
5. A single fluorescence-based LAMP reaction for identifying multiple parasites in mosquitoes. *Exp. Parasitol.* 125, 179-183. (2010).
6. p38 MAPK-dependent phagocytic encapsulation confers infection tolerance in *Drosophila*. *Cell Host Microbe.* 6, 244-252. (2009).

Unit 4 (Molecular Diagnosis)

1. Development of loop-mediated isothermal amplification (LAMP) method for diagnosis of equine piroplasmosis. *Vet. Parasitol.* 143, 155-160. (2007).
2. Development of a rapid immunochromatographic test for simultaneous serodiagnosis of bovine babesioses caused by *Babesia bovis* and *Babesia bigemina*. *Am. J. Trop. Med. Hyg.* 78, 117-1121. (2008).
3. Isolation and pathogenic characterization of an OB1 variant of *Babesia rodhaini* which has a glycophorin A-independent pathway to murine red blood cells. *Vet. Parasitol.* 159, 97-104. (2009).
4. Inhibitory effects of (-)-Epigallocatechin -3-gallate from green tea on the growth of *Babesia* parasites. *Parasitology.* 137, 785-791. (2010).
5. Inhibitory effect of terpene nerolidol on the growth of *Babesia* parasites. *Parasitol. Int.* 59, 278-282. (2010).

Unit 5 (Advanced Preventive Medicine)

1. A new trypanosome species isolated from naturally infected *Haemaphysalis hystricis* ticks in Kagoshima Prefecture, Japan. *Parasitology* 134, 967-974. (2007).
2. Identification and molecular characterization of a novel stage-specific surface protein of *Trypanosoma congolense* epimastigotes. *Mol. Biochem. Parasitol.* 161, 1-11. (2008).
3. Analysis of expressed sequence tags from the four main developmental stages of *Trypanosoma congolense*. *Mol. Biochem. Parasitol.* 168, 34-42. (2009).
4. Association of molecular markers in *Plasmodium falciparum crt* and *mdr1* with *in vitro* chloroquine resistance: A Philippine study. *Parasitol. Int.* 58, 166-70. (2009).
5. Target proteins of the cytosolic thioredoxin in *Plasmodium falciparum*. *Parasitol. Int.* 59, 298-302. (2010).

Unit 6 (Infection and Pathology)

1. Molecular and biochemical characterization of *Toxoplasma gondii* β -Hydroxyacyl-Acyl Carrier Protein Dehydratase (FABZ). *Parasitol. Res.* 102, 1301-1309. (2008)
2. High seroprevalence of *Encephalitozoon cuniculi* in pet rabbits in Japan. *J. Vet. Med. Sci.* 70, 1301-1304. (2008).
3. *Toxoplasma gondii*: identification and characterization of bradyzoite-specific deoxyribose phosphate aldolase-like gene (*TgDPA*). *Exp. Parasitol.* 121, 55-63. (2009).
4. Microsporidian *Encephalitozoon cuniculi* antibodies in rabbit urine samples. *Veterinary Record* 165, 85-86. (2009)
5. *Toxoplasma gondii* deoxyribose phosphate aldolase-like protein (*TgDPA*) interacts with actin depolymerizing factor (*TgADF*) to enhance the actin filament dynamics in the bradyzoite stage. *Mol. Biochem. Parasitol.* 193, 39-42. (2010)

Unit 7 (Food-borne Bacterial Diseases)

1. An outbreak of food-borne listeriosis due to cheese in Japan, during 2001. *Int. J. Food Microbiol.* 104, 189-196. (2005).
2. Resuscitation of the viable but non-culturable state of *Salmonella enterica* serovar Oranienburg by recombinant resuscitation-promoting factor derived from *Salmonella* Typhimurium strain LT2. *Int. J. Food Microbiol.* 106, 241-247. (2006).
3. Molecular typing of *Vibrio cholerae* O1 isolates from Thailand by pulsed-field gel electrophoresis. *J. Health Popul. Nutr.* 26, 79-87. (2008).
4. Proteomic characterization of enterohemorrhagic *Escherichia coli* O157:H7 in the oxidation-induced viable but non-culturable state. *Microbiol. Immunol.* 51, 875-881. (2008).
5. Rapid detection of *Brucella* spp. by the loop-mediated isothermal amplification method. *J. Appl. Microbiol.* 104, 1815-1823. (2008).

Unit 8 (Emerging and Re-emerging Viral Diseases)

1. Partial protection against challenge with the highly pathogenic H5N1 influenza virus isolated in Japan in chickens infected with the H9N2 influenza virus. *Arch. Virol.* 152, 1395-1400. (2007).
2. Copper-induced inactivation of influenza A virus. *Arch. Virol.* 153, 1467-1472. (2008).
3. Detection of antibody to avian influenza virus with electro-chemical immunoassay (eELISA). *Anal. Sci.* 24, 1619-1622. (2008).
4. Mechanism of the antiviral effect of hydroxytyrosol on influenza virus appears to involve morphological change of the virus. *Antiviral. Res.* 83, 35-44. (2009).
5. A latex agglutination test using a recombinant nucleoprotein for detection of antibodies against avian influenza virus. *J. Virol. Methods.* 161, 259-264. (2009).

III. Conditions and Procedures for Application

1. Expectations for the Participating Organizations:

- (1) This program is designed primarily for organizations that intend to address specific issues or problems identified in their operations. Applying organizations are expected to use the program for those specific purposes.
- (2) Applying organizations are expected to nominate the most qualified candidates to address the said issues or problems, carefully referring to the qualifications described in section III-2 below.
- (3) Applying organizations are also expected to be prepared to make use of knowledge acquired by the nominees for the said purpose.

2. Nominee Qualifications:

Applying Organizations are expected to select nominees who meet the following qualifications:

Essential qualifications

I . This training program is designated for participants who should:

- (1) be a holder of a Bachelor of Science or Master of Science Degree in Biology, Zoology or of a related field, or a graduate of Veterinary Medicine or Medical Science;
- (2) be currently employed as a lecturer of an university/college, a researcher of a national/public institute, and/or a technician of an administrative agency;
- (3) be engaged in educational/research work on infectious diseases, and/or planning/ implementation of infectious disease control measures for more than three (3) years.

II . Other requirements that should be met by the applicant:

- (1) Should be nominated by their respective government in accordance with the procedures mentioned in section III 4. Procedure for Application and Selection.
- (2) Health: In good health physically and mentally to undergo the training;
- (3) Language: competent command of spoken and written English, which is equal to TOEFL CBT* 200 (PBT** 578) or more (The program is commanded by English; therefore participants are requested to have sufficient English ability. Please attach an official certificate on the participants' English ability such as TOEFL, TOEIC, etc., if possible.)

*CBT: Computer Based Testing / **PBT: Paper Based Testing

- (4) Must not be serving any form of military service.
- (5) Non-expectant, as training over a long period may pose risks to pregnant women. (Note: Pregnancy is a disqualifying condition for this training program).

3. Required Documents for Application

- (1) **Application Form**: the Application Form is available at the respective countries' JICA Overseas Offices or the Embassies of Japan.

(2) Inception Report and Questionnaire: should be submitted with the Application Form. The detailed information is provided in the Annex, Attachment 1 and 2.

(3) Nominee's English Score Sheet: to be submitted with the Application Form. If the participants have any official documentation of his/her English ability (e.g., TOEFL, TOEIC, IELTS), please attach it (or a copy) to the Application Form.

4. Procedure for Application and Selection :

(1) Submitting the Application Documents:

Closing date for application to the JICA Obihiro International Center in Japan:

September 3, 2010

Note: Please confirm the closing date set by the each country's JICA Office or Embassy of Japan of your country to meet the final date in Japan.

(2) Selection:

After receiving the document(s) through due administrative procedures in the respective governments, the respective countries' JICA Offices (or Embassies of Japan) shall conduct screenings, and send the documents to the JICA Obihiro International Center in charge in Japan. Final selection shall be made by the JICA Obihiro International Center in consultation with the organizations concerned in Japan based on submitted documents according to qualifications. Organizations with intention to utilize the opportunity of this program will be highly valued in the selection.

(3) Notice of Acceptance:

Notification of results shall be made by the respective countries' JICA Offices (or Embassies of Japan) to the respective Governments by **not later than September 24, 2010.**

5. Conditions for Attendance:

(1) to observe the schedule of the program,

(2) not to change the program subjects or extend the period of stay in Japan,

(3) not to bring any members of their family,

(4) to return to their home countries at the end of the program in Japan according to the travel schedule designated by JICA,

(5) to refrain from engaging in political activities, or any form of employment for profit or gain,

(6) to observe the rules and regulations of their place of accommodation and not to change the accommodation designated by JICA.

IV. Administrative Arrangements

1. Organizer:

- (1) **Name:** JICA Obihiro International Center (JICA Obihiro)
- (2) **Contact:** Mr. TAKASAKA Muneo (Takasaka.Muneo@jica.go.jp)

2. Implementing Partner:

- (1) **Name:** Obihiro University of Agriculture and Veterinary Medicine
- (2) **URL:** <http://www.obihiro.ac.jp/>

3. Travel to Japan:

- (1) **Air Ticket:** The cost of a round-trip ticket between an international airport designated by JICA and Japan will be borne by JICA.
- (2) **Travel Insurance:** Term of Insurance: From arrival to departure in Japan. The traveling time outside Japan shall not be covered.

4. Accommodation in Japan:

JICA will arrange the following accommodations for the participants in Japan:

Obihiro International Center (OBIC)

Address: 1-2, Minami 6-chome, Nishi 20-jo, Obihiro-city, Hokkaido, 080-2470, Japan

TEL: 81-155-35-2001 FAX: 81-155-35-2213

(where "81" is the country code for Japan, and "155" is the local area code)

If there is no vacancy at OBIC, JICA will arrange alternative accommodations for the participants.

5. Expenses:

The following expenses will be provided for the participants by JICA:

- (1) Allowances for accommodation, living expenses, outfit, and shipping.
- (2) Expenses for study tours (basically in the form of train tickets).
- (3) Free medical care for participants who become ill after arriving in Japan (costs related to pre-existing illness, pregnancy, or dental treatment are not included).
- (4) Expenses for program implementation, including materials.

For more details, please see p. 9-16 of the brochure for participants titled "KENSU-IN GUIDE BOOK," which will be given to the selected participants before (or at the time of) the pre-departure orientation.

6. Pre-departure Orientation:

A pre-departure orientation will be held at the respective country's JICA Office (or Japanese Embassy), to provide participants with details on travel to Japan, conditions of the workshop, and other matters.

V. Other Information

- 1. Participants who have successfully completed the training program will be awarded

a diploma by Obihiro University of Agriculture and Veterinary Medicine and certificate by JICA.

2. School visit

For the purpose of the promotion of "international education", this program includes a school visit to Japanese local elementary or junior high schools as well as communities. All the participants are requested to take part in this exchange program. To introduce your country, it is advisable for participants to bring some

- (1) musical instruments, and/or popular music CDs,
- (2) crafts,
- (3) photos of foods, clothes, housings, and families of participants (digital data are preferable) and so on.

There are also some cases to introduce their country's dances and games.

3. Medical history

In case you have or have had malaria, you are kindly requested to bring the medicine for malaria with you because it is quite difficult to obtain it in Japan.

4. Climate

The climate condition in Obihiro is given below. Participants are advised to prepare appropriate clothes.

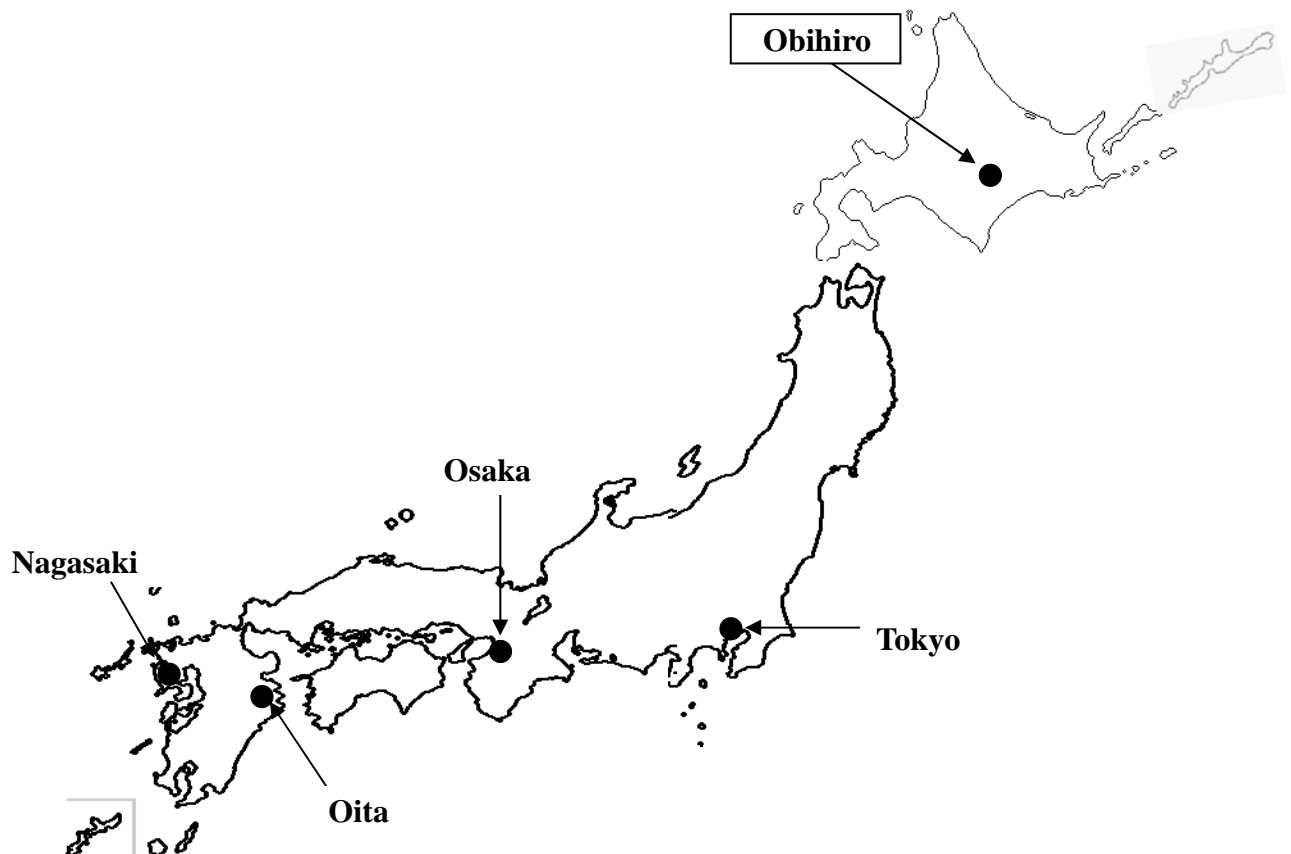
		Winter		Spring			Summer			Autumn		Winter	
		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature (°C)	Maximum	-2	-1	3	11	18	20	24	25	21	15	8	1
	Average	-8	-7	-2	5	11	15	18	20	16	10	3	-4
	Minimum	-14	-13	-7	0	5	10	15	16	12	4	-2	-9
Humidity (%)		70	69	67	66	69	79	83	82	79	73	68	69
Precipitation (mm)		42	31	50	61	80	86	94	139	140	92	68	40

(Average from 1971 to 2000)

5. Study Trip

As a supplemental program, there will be study trips during your stay.

1. Visit to Nagasaki and Oita Duration: About 5 days in total
(Institute of Tropical Medicine, Nagasaki University, and Oita University, etc.)
2. Visit to Tokyo and Osaka Duration: About 6 days in total
(Animal Quarantine Service, and Research Institute for Microbial Disease, Osaka University, etc)



VI. ANNEX:

Attachment-1

Inception Report

With the Application Form, applicants should submit their Inception Reports on their current jobs.

This Report will be used for the screening of successful applicants as well as for the selection of the most suitable training subject for the participants. Applicants who do not attach their Inception Reports and Questionnaire to the Application Form will not be duly considered.

a. Purpose

- (1) To clarify issues and problems presently faced in their work in order to facilitate the acquisition of knowledge and ideas leading to solutions during the training.
- (2) To provide advanced information regarding issues and problems faced by participants to instructors and organizations concerned with the program as a point of reference in finding solutions.

b. Contents

- (1) Name of program
- (2) Name of applicant
- (3) Name of organization
- (4) A brief introduction of work they have been in charge of for the last one year
- (5) Problem facing in the applicant's country
- (6) Fields of particular interest in the program and its reason

c. Layout

Typewritten in English, less than 5 pages (12-point font, double spaced, A4 size paper)

d. Presentation

- (1) The time allocation for each presentation of the Job Report will be about 10 minutes.
- (2) It is advisable to use audio visual aids such as Microsoft PowerPoint, overhead projectors, or pictures presenting the Job Report.

QUESTIONNAIRE

NAME of the Applicant: _____

COUNTRY: _____

1. Please list the four Research Units and indicate the subjects offered to JICA participants in order of preference. (See *II. Description 9. Expected Module Output and Contents*) Participants are not assured to be assigned to the high-priority unit in the case the unit will be chosen by other participants, because each unit could accept only one or two participants. Especially, unit 6 and unit 7 have high possibility to be selected by multiple participants because they are only unit of bacteria or virus diseases in this program.

First Choice: ()

Second Choice: ()

Third Choice: ()

Fourth Choice: ()

2. Please describe briefly your experience, if any, in the research subjects you have chosen above.

(1)

(2)

(3)

(4)

3. Please check following techniques which you have mastered.

1) Culture of pathogens: () viruses, () bacteria, () protozoa

2) () SDS-PAGE, () Western Blot,

3) () IFAT, () ELISA

4) () Molecular cloning, () DNA sequencing, () PCR

4. Please list your publications, if any.

For Your Reference

JICA and Capacity Development

The key concept underpinning JICA operations since its establishment in 1974 has been the conviction that “capacity development” is central to the socioeconomic development of any country, regardless of the specific operational scheme one may be undertaking, i.e. expert assignments, development projects, development study projects, training programs, JOCV programs, etc.

Within this wide range of programs, Training Programs have long occupied an important place in JICA operations. Conducted in Japan, they provide partner countries with opportunities to acquire practical knowledge accumulated in Japanese society. Participants dispatched by partner countries might find useful knowledge and re-create their own knowledge for enhancement of their own capacity or that of the organization and society to which they belong.

About 460 pre-organized programs cover a wide range of professional fields, ranging from education, health, infrastructure, energy, trade and finance, to agriculture, rural development, gender mainstreaming, and environmental protection. A variety of programs and are being customized to address the specific needs of different target organizations, such as policy-making organizations, service provision organizations, as well as research and academic institutions. Some programs are organized to target a certain group of countries with similar developmental challenges.

Japanese Development Experience

Japan was the first non-Western country to successfully modernize its society and industrialize its economy. At the core of this process, which started more than 140 years ago, was the “*adopt and adapt*” concept by which a wide range of appropriate skills and knowledge have been imported from developed countries; these skills and knowledge have been adapted and/or improved using local skills, knowledge and initiatives. They finally became internalized in Japanese society to suit its local needs and conditions.

From engineering technology to production management methods, most of the know-how that has enabled Japan to become what it is today has emanated from this “*adoption and adaptation*” process, which, of course, has been accompanied by countless failures and errors behind the success stories. We presume that such experiences, both successful and unsuccessful, will be useful to our partners who are trying to address the challenges currently faced by developing countries.

However, it is rather challenging to share with our partners this whole body of Japan’s developmental experience. This difficulty has to do, in part, with the challenge of explaining a body of “tacit knowledge,” a type of knowledge that cannot fully be expressed in words or numbers. Adding to this difficulty are the social and cultural systems of Japan that vastly differ from those of other Western industrialized countries, and hence still remain unfamiliar to many partner countries. Simply stated, coming to Japan might be one way of overcoming such a cultural gap.

JICA, therefore, would like to invite as many leaders of partner countries as possible to come and visit us, to mingle with the Japanese people, and witness the advantages as well as the disadvantages of Japanese systems, so that integration of their findings might help them reach their developmental objectives.



CORRESPONDENCE

For enquiries and further information, please contact the JICA Office or the Embassy of Japan. Further, address correspondence to:

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TEL: +81-155-35-1210 FAX: +81-155-35-1250

Website: www.jica.go.jp/english/

E-mail: jicaobic@jica.go.jp