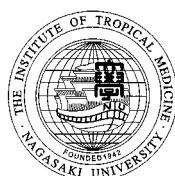


INSTITUTE OF TROPICAL MEDICINE NAGASAKI UNIVERSITY

through Scientific Discovery and its Application Solving the World Health Problem



AUGUST



2009

MISSION STATEMENT

Institute of Tropical Medicine (NEKKEN), Nagasaki University

The tropics, the most ecologically diverse region on the Earth, presents an ongoing complexity of tropical diseases and other health problems. In view of the remarkable advances made in the field of international exchange in recent years, it is imperative that these problems be addressed from a global perspective.

Based on this understanding, the Institute of Tropical Medicine, Nagasaki University, aims to overcome tropical diseases, particularly infectious diseases, and the various health problems associated with them, in cooperation with related institutions, to strive for excellence in the following areas:

1. Spear-head research in tropical medicine and international health
2. Global contribution through disease control and health promotion in the tropics by applying the fruits of the research
3. Cultivation of the researchers and specialists in the above fields



General View of the Institute



Preface

The Institute of Tropical Medicine, Nagasaki University, has a Global COE Program entitled "Global Control Strategy of Tropical and Emerging Infectious Diseases." In the second year of our program, 2009, research efforts were fully launched by a total of 22 principal investigators (PIs). Our institute received approval by the Ministry of Education, Culture, Sports, Science and Technology to continue to serve as one of the collaborative research institutes in Japan in 2010 and onward.

The Institute of Tropical Medicine, Nagasaki University, established in 1942, is a unique government-assisted institution for the research on tropical medicine, both in the basic and applied fields. Its reorganization led to the first collaborative institute in medical science in Japan in 1989, and designation as one of the Centers of Excellence in 1995 by Ministry of Education, Science and Culture. Present organization of the institute is composed of 3 major research

fields (12 departments, 1 domestic visiting department, 1 overseas visiting department), 4 centers, and 1 clinical unit.

The Institute of Tropical Medicine set its "General Goals: Mission Statement" in May 1999. Diverse activities below are underway to achieve these general goals, with the indication of asterisk.

* "Spear-head research in tropical medicine and international health"

1. Strategic research activities have been conducted to develop new countermeasures against tropical diseases. These activities include analysis of base sequences of Japanese encephalitis and dengue virus genes, unraveling of structure and mechanism of host receptors for bacterial toxins, analysis of cell invasion by malaria parasites at molecular levels, and immunological analysis of tropical infectious diseases.
2. Epidemiological studies and research on malaria, dengue fever/dengue hemorrhagic fever, emerging viral infectious diseases, AIDS, acute respiratory infections, schistosomiasis, tropical infectious diseases, etc., in Southeast Asia, Eastern Africa, and other countries/regions.
3. Environmental factors, such as vector and socio-economic problem, which cause the spread of tropical diseases in the developing countries have been studied.

* "Global contribution through diseases control and health promotion in the tropics by applying the fruits of the research"

1. When the world was suffering from a severe outbreak of SARS in 2003, the institute dispatched 3 researchers to P.R. China and other countries in response to a request of WHO.
2. And in 2005, the institute dispatched the investigation team to make a survey of possible outbreak of infectious diseases in Indonesia and Sri Lanka, the countries that met disaster of tsunami. Thus the staffs have given their technical co-operation to disease control program in developing countries as WHO short-term consultants, JICA experts and other consultants.

* "Cultivation of the researchers and specialists in the above fields"

1. The institute offers training to graduate students (in doctor's and master's courses) through collaborative courses with Nagasaki University Graduate School of Biomedical Sciences. In 2006, the institute launched a one-year master's course in tropical medicine for MD students. In 2008, the institute started to offer programs for students (capacity: 10) as an entity closely related to the master's course at Nagasaki University Graduate School of International Health Development (an independent graduate school).
2. Since 1978, the institute offers a 3-month course of Tropical Medicine and Related Studies.
3. Since 1983, the institute holds one year training course for foreign participants entitled "Research in Tropical Medicine" sponsored by JICA.
4. Since 2006, by the cooperation of WHO/TDR, the institute started "Diploma Course on Research & Development of Products to meet Public Health Needs" (3 weeks) which 6 universities in 4 countries (Japan, Thailand, China, and Colombia) cooperated to hold the course.

Based on the achievement mentioned above, in 1993, Department of Virology has been designated as WHO Collaborating Centre for Reference and Research on Tropical Viral Diseases, and since 2000 the Institute has played a role of core university in JSPS cooperative research program with Vietnam.

In 2003, Institute of Tropical Medicine and Graduate School of Biomedical Sciences made a joint application to the 21st Century Center of Excellence Program supported by Ministry of Education, Culture, Sports, Science and Technology. Our research program "Global Control Strategy of Tropical and Emerging Infectious Diseases" successfully obtains a Government Grant of 5 years.

In 2005, the overseas research laboratories of the Institute of Tropical Medicine has been established in Kenya Medical Research Institute, Nairobi, Kenya and National Institute of Hygiene and Epidemiology, Hanoi, Vietnam. In 2008, the institute's proposal was approved as a Global COE Program, an advanced form of the 21st Century COE Program. In 2009, the institute's proposal was approved as a "Promotion of International Collaboration" project for strategic promotion of Asia-Africa cooperation for science and technology within the framework of Special Coordination Funds for Promoting Science and Technology under the auspices of the Cabinet Office. With this approval, the institute started to work on development of a new surveillance method for chronic infectious diseases primarily at the laboratory in Kenya.

In March 2009, the institute staged an eight-day special exhibition entitled "Africa's Nature, Development, and People – Nagasaki University Fighting against Tropical Infectious Diseases" at the National Museum of Nature and Science, Tokyo, which attracted over 10,000 visitors. A special open lecture, which was held as part of the exhibition, was attended by many participants.

In addition, the institute has a home page by which we appeal the public how tropical medicine is important for the well being of humankind and offer the information on the tropical diseases.

This pamphlet is one of our advocacy efforts to the public. It offers a brief but intelligible explanation on our research activities and other related social activities. Any suggestions and supports will be gratefully appreciated.

August, 2009
Kenji Hirayama M. D., Ph. D.
Dean
Institute of Tropical Medicine
Nagasaki University

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Historical Review

The Institute of Tropical Medicine, Nagasaki University was originally founded in March 1942 as the East Asia Research Institute of Endemics, Nagasaki Medical College in order to perform basic and applied studies on endemic diseases in East Asia. At the beginning, most of its research activities were field studies conducted in mainland China by the Departments of Pathology, Bacteriology, Internal Medicine, and Dermatology of Nagasaki Medical College. August 9th, 1945, the atomic bomb was dropped in Nagasaki, and the Institute's all the facilities and research materials were completely destroyed together with Medical School. Consequently, the development of the Institute and its research activities had lagged significantly behind.

In April, 1946, the Institute changed its name to the Research Institute of Endemics, Nagasaki Medical College, and moved to Isahaya City in May to resume research activities. Yet in accordance with the National School Establishment Law issued in May, 1949, the Institute once again changed its name to the Research Institute of Endemics, Nagasaki University. In 1957, the Institute was affected by another disaster of massive flooding, and its facilities, equipment, and research materials were severely damaged. Thus, construction of a new building started in Sakamoto, Nagasaki City in 1960, and the Institute moved to the building in April of the following year. The Institute's Departments, which were only two at the time, Pathology and Clinics, increased its number every year after 1963, including Epidemiology, Parasitology, and Virology. The Sakamoto building finished its first expansion at the end of 1966.

In June, 1967, with the partial alteration of the National School Establishment Law, the name of the Institute was changed for the third time to the present one to carry out basic and applied studies on tropical medicine. Around the same time, the Department of Internal Medicine, Institute of Tropical Medicine, equipped with 20 beds, was opened in the University Hospital. In 1974, the Department of

Bacteriology and the Reference Center were attached, and in 1978, the Department of Preventive Medicine, consisting mainly of visiting professors, associate professors, and researchers, and the Tropical Medicine Training Course were launched. In the ensuing year, the Infectious Animals Deprivation Experiment Laboratory was promoted to become the Animal research Center for Tropical Infections, and the second building expansion was concluded in March, 1980. In September, 1983, a JICA-sponsored group training program "Tropical Medicine Research Course" was opened, the Department of Protozoology was established a year after, and the third building extension was finished in July the year after that. Two years later, the Department of Medical Entomology was created and the Institute was reorganized into the collaborative institute in another two years. In 1991, the Department of Biochemistry was added, and the fourth building expansion was ended in March, 1994. In April, 1994, the Institute was divided into three big Divisions, Tropical Microbiology, Pathogenesis and Clinical Sciences, and Environmental Medicine, with the establishment of two new research Departments, Thermal Adaptation and Social Environment, which have expanded to 12 Departments at present. The Institute was designated as "Center of Excellence" in the forefront of scientific research in 1995, and a new research Department, Molecular Epidemiology, was established under the Research Field of Microbiology in 1996 to invite overseas visiting professors. In 1997, the Reference Room for the Tropical Medicine was replaced by the Tropical Disease Information and Reference Center, and it was again succeeded by the Research Center for Tropical Infectious Disease in 2001. In March, 2003, when the Sakamoto building finalized its fifth expansion, its extension work of almost 40 years came to an end. In March, 2006, the main building's repair work was completed. In April 2008, the Research Center for Tropical Infectious Disease for the Tropical Medicine was replaced by the Center for Infectious Disease Research in Asia and Africa and Tropical Medicine Museum.



Successive Deans of the Institute

(East Asian Research Institute of Endemics)

Susumu Tsunoo	May. 4, 1942 - Aug. 22, 1945
Kohei Koyano	Dec. 22, 1945 - Jan. 23, 1948
Kiyoshi Takase	Jan. 24, 1948 - Aug. 31, 1948
Noboru Tokura	Sept. 1, 1948 - May. 30, 1949

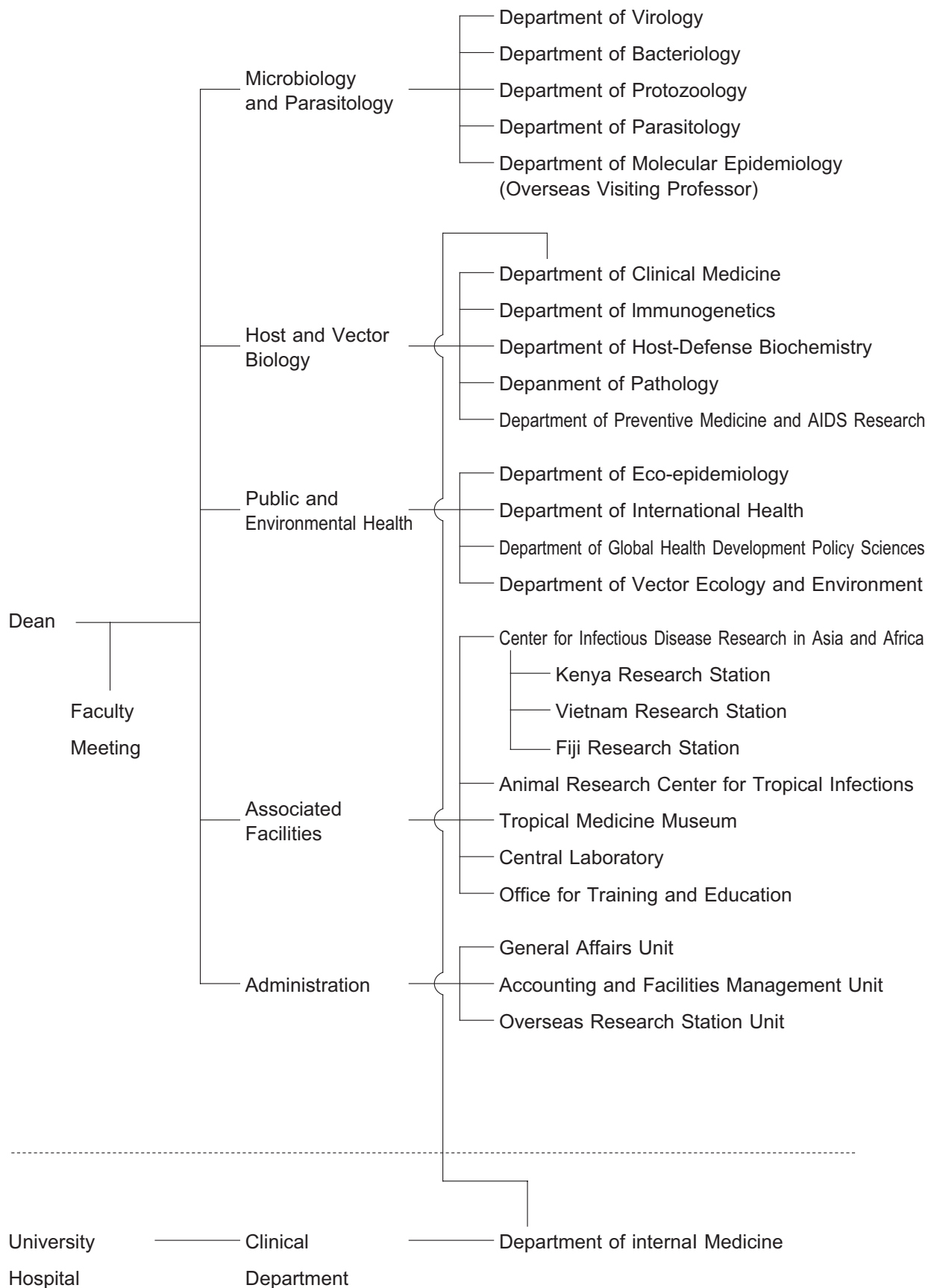
(Research Institute of Endemics)

Noboru Tokura	May. 31, 1949 - Aug. 31, 1958
Nanzaburo Omori	Sept. 1, 1958 - Nov. 30, 1963
Hideo Fukumi	Dec. 1, 1963 - May. 31, 1967

(Institute of Tropical Medicine)

Hideo Fukumi	June. 1, 1967 - Nov. 30, 1969
Daisuke Katamine	Dec. 1, 1969 - Nov. 30, 1973
Kaoru Hayashi	Dec. 1, 1973 - Nov. 30, 1977
Tatsuro Naito	Dec. 1, 1977 - Nov. 30, 1979
Daisuke Katamine	Dec. 1, 1979 - Apr. 1, 1981
Keizo Matsumoto	Apr. 2, 1981 - Apr. 1, 1991
Hideyo Itakura	Apr. 2, 1991 - Apr. 1, 1993
Mitsuo Kosaka	Apr. 2, 1993 - Apr. 1, 1997
Akira Igarashi	Apr. 2, 1997 - May. 31, 2001
Yoshiki Aoki	Apr. 1, 2001 - May. 31, 2007
Kenji Hirayama	Apr. 1, 2007 - Up to the present

Organizational Chart



Collaboration research

The institute has conducted research in the field of tropical medicine for the past 66 years since its establishment in 1942. The institute was reorganized to make extensive collaboration with other universities and institute in the field of interdisciplinary tropical medicine with molecular biology, entomology, anthropology, social medicine, etc.

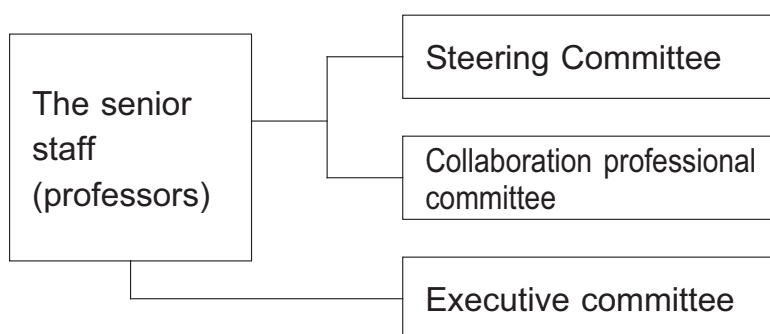
These activities of the institute are expected to

contribute to remarkable progress of tropical medicine.

The senior staff composed of professors of the institute and the executive committee make plans for research work. The steering committee and the collaboration professional committee composed of experienced scientists coordinate the various collaboration researches.

In the FY2008 a total of 12 selected projects and 1 scientific meetings were carried out.

Collaboration Research System



Institute of Tropical Medicine Steering Committee

Nagasaki University	Professor Emeritus	Akira Igarashi
Toyama Institute of Health	Director	Takeshi Kurata
International Medical Center of Japan	President Emeritus	Takehiko Sasazuki
School of Medicine, Keio University	Professor	Tsutomu Takeuchi
Research Institute for Humanity and Nature		
	Director-General	Narifumi Tachimoto
Osaka University	Professor Emeritus	Takeshi Honda
Tokyo Metropolitan University / National Museum of Ethnology		
	Professor Emeritus	Makio Matsuzono
The Institute of Medical Science,		
The University of Tokyo	Dean	Motoharu Seiki
Graduate School of Biomedical Sciences	Professor	Toshifumi Matsuyama
Graduate School of Biomedical Sciences	Dean	Shunichi Yamashita
Institute of Tropical Medicine	Dean	◎Kenji Hirayama
〃	Professor	Kouich Morita
〃	Professor	Toshiya Hirayama
〃	Professor	Osamu Kaneko
〃	Professor	Shinjiro Hamano
〃	Professor	Koya Ariyoshi
〃	Professor	Naoki Yamamoto
〃	Professor	Masaaki Shimada
〃	Professor	Taro Yamamoto
〃	Professor	Tsutomu Mizota
〃	Professor	Masahiro Takagi
〃	Professor	Noboru Minakawa

◎ : Chairman

Institute of Tropical Medicine Collaboration Professional Committee

The Institute of Medical Science, The University of Tokyo	Professor	Aikichi Iwamoto
Meiji Gakuin University, The Faculty of International Studies	Professor	Akira Oki
Graduate School of Medicine, The University of Tokyo	Professor	Kiyoshi Kita
Graduate School of Veterinary Medicine, Hokkaido University	Professor	Ikuo Takashima
Tsuda College Undergraduate Courses	Professor	Chizuru Misago
Kobe University Graduate School of Medicine	Professor	Haku Hotta
Research Institute for Humanity and Nature	Professor	Kenichi Abe
Institute of Tropical Medicine	Professor	Kouichi Morita
//	Professor	Toshiya Hirayama
//	Professor	Osamu Kaneko
//	Professor	Shijiro Hamano
//	Professor	Koya Ariyoshi
//	Dean	Kenji Hirayama
//	Professor	Naoki Yamamoto
//	Professor	Masaaki Shimada
//	Professor	Taro Yamamoto
//	Professor	Tsutomu Mizota
//	Professor	◎Masahiro Takagi
//	Professor	Noboru Minakawa

◎ : Chairman

Character of research organization and activities

Based on the following research organization and intimate linkages with other research institutes and universities, the institute aims at accomplishing a mission “Spear-head research in tropical medicine and international health”.

- To study comprehensively the tropical diseases which are raging in the developing countries, research organization of the institute consists of 3 major research fields which deal with the classical triad of “human-agent-environment” determinants of infectious diseases and Overseas Research Station, Animal Research Center for Tropical Medicine, and Tropical Medicine Museum. Other facilities of the institute include a joint research laboratory and a tropical medicine education office.
- The research of tropical medicine faces the inevitable fact that “the bench is in the bush” Therefore the institute has a close linkage with the overseas institutes in Asia, Africa and South Americas and continues the joint studies. Memorandums of academic exchange programs were signed between Nagasaki University and 8 overseas institutes. Since the overseas research laboratories of the institute has been established in Kenya Medical Research Institute, Kenya and National Institute of Hygiene and Epidemiology Vietnam in 2005, by the grants from Ministry of Education, Sports, Culture, Science and technology (MEXT), the extensive and longitudinal studies on tropical diseases are on the progress. The exchange program under the core university system of JSPS established between our Institute and National Institute of Hygiene and Epidemiology in Vietnam in 2000 has been renewed in 2005 and lasts for 5 years more.
- The prevalence of tropical diseases depends on the geographic, social and economic factors. Therefore the institute has established the special research system which helps forward the multidisciplinary studies on tropical diseases.

Graduate Courses

In April, 2002, the structure of doctoral course in Nagasaki University was re-organized; three Graduate Schools of Medical Science, Dental

Science and Pharmacology were integrated into the Graduate School of Biomedical Sciences. The school now runs four doctoral courses. All the departments in the Institute of Tropical Medicine (ITM) belong to the Course of Infection Research. Students who wish to apply for the doctoral course under the supervision of the ITM, are requested to contact the professor of department where he or she wishes to study, prior to the submission of application form to the office of the Graduate School.

In April, 2006, the Nagasaki University graduate school of Biomedical Sciences opened the Master of Tropical Medicine (MTM) course, which accommodates 12 students from various countries. The curriculum consists of three parts: (1) 4 months intensive lecture and practice on Clinical Tropical Medicine and Tropical Public Health, (2) 2 weeks overseas group training on tropical clinical medicine and public health in Thailand, and (3) 6 months dissertation preparation for each student's subject. For further 2 weeks of clinical training for individual student in the tropics, we cooperated three teaching hospitals, Chiangmai University Hospital, Thailand, Chora Hospital, Ho Chi Minh City, Vietnam, and San Lazaro Hospital, Manila, Philippines. The application form is available through our homepage. The applicant should have more than two years of clinical experience as a medical doctor, and should have sufficient communication skill in English.

In April, 2008, the Graduate School of International Health Development was founded at Nagasaki University. The main aim is to cultivate specialists who contribute to the promotion of good health in developing countries. A Master of Public Health (M.P.H) degree is awarded to students who successfully complete this two-year course. Since tropical medicine plays a pivotal role in promoting good health internationally, three professors from the ITM serve as a full-time faculty member in the program.

Three-month Course on Tropical Medicine

This is a short-course of tropical medicine. This course aims to support medical and paramedical personnel who plan to work in the tropics, by providing opportunities to learn a broad range of skills and knowledge relevant to practicing medicine, directing disease control programs and conducting medical

research in tropical and developing countries.

The course began in 1978. Up to the 31th course held in 2008, 366 personnel (including 147 medical doctors, and 219 paramedical such as nurses, community- health nurse, midwives, pharmacist) from all over Japan have completed the course. Fifteen participants are accepted to attend the course in each year. The course is run by the steering committee, which consists of members from both inside and outside the Institute of Tropical Medicine (ITM).

The full-time staff members of the ITM and a substantial number of visiting professors and lecturers provide the 14 weeks (June to August) of lectures, laboratory practicals and field work in the field of virology, bacteriology, protozoology, parasitology, medical entomology, pathology, immunogenetics, epidemiology, human ecology, social medicine, clinical medicine and also geography and culture in tropics. Participants who completed the course successfully are awarded the Diploma in Tropical Medicine.



Admission ceremony in 2008

Clinical Medicine and Research for Tropical Doctors (JICA Training Program)

As a part of Japan Government Technical Cooperation Programs for contributing to upgrading the levels of tropical medicine research, to improving medical standard, and to promoting friendly relations to the developing countries, this training course was established in 1983, in collaboration with the Japan International Cooperation Agency (JICA). As of 2008, the ITM has trained 199 trainees from 49 countries in Asia, Africa, Latin America etc.

The objective of this course is to provide trainees with various opportunities to enrich their basic knowledge and practical techniques for controlling endemic and epidemic diseases and conducting

medical research to improve various medical problems in their countries in the tropics.

Every year, the ITM has accommodated 5-10 trainees. Each trainee belongs to a host department where they conduct their research and receive a Diploma from the ITM. Since April 2006, this training course was formally linked to the Graduate School of Biomedical Sciences, Nagasaki University and trainees receive a higher quality of training and education.

Public Communication

Lectures and film shows for citizens are held occasionally. Every year, several groups of high school students with teachers visit our museum, attending lectures and film shows. To accumulate know-how of risk communication on tropical infectious diseases in our institute, we are planning to introduce “science cafe” sessions where we have frank communication with citizens on the present state and future prospects of research on tropical medicine.

Publications

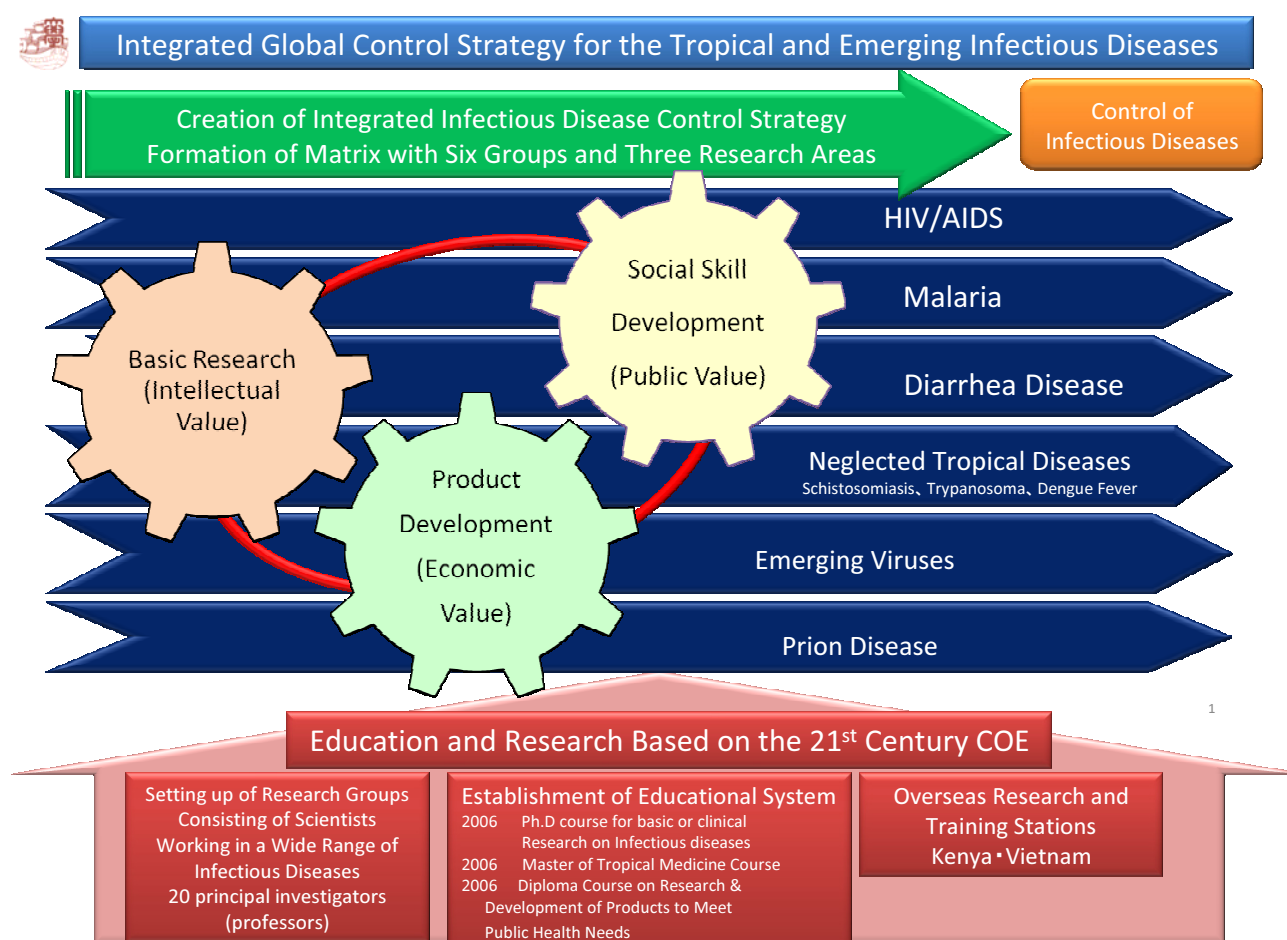
Our official publications are as follows;

- 1) Bulletin of Nagasaki University Institute of Tropical Medicine (in Japanese, yearly since 1964, PDF files are available at our Web page.)
- 2) English Brochure: INSTITUTE OF TROPICAL MEDICINE NAGASAKI UNIVERSITY (this copy. Yearly since 1977, PDF files are available at our Web page.)
- 3) Japanese Brochure (in Japanese yearly since 1977, PDF files are available at our Web page.)
- 4) Report of Nation-wide Cooperative Research Projects (Information of research activities and achievements as a nation-wide cooperative research center for tropical medicine is compiled.)
- 5) Tropical Medicine (An academic Journal issued since 1967 are now suspended since 2002. PDF files are available at <http://naosite.lb.nagasaki-u.ac.jp/dspace/handle/10069/6>. Electric files of Annals of Endemic Diseases (in Japanese, 1959-1966, the predecessor of Tropical Medicine) are also available at the same Web page.)
- 6) Special memorial volumes of the 20th, 30th and 50th anniversary (in Japanese)

Global COE Program Integrated Global Control Strategy for the Tropical and Emerging Infectious Diseases

The United Nations issued eight development goals in its Millennium Declaration in 2000 as international targets, with the core message being measures against infectious diseases expressed as follow: "Stop the occurrence of major diseases including HIV/AIDS by 2015 and decrease the subsequent incidence rate." The ultimate goal of this program is to control and conquer these major infectious diseases. We will further advance and internationalize our outstanding achievements in the 21st century COE program to create a new center of excellence (COE) toward the accomplishment of these objectives.

For controlling and overcoming infectious diseases, tactical strategies and personnel with appropriate skills to carry them out are absolutely necessary. This new COE will focus on "neglected infectious diseases (dengue fever, schistosomiasis, etc.)", which have rarely been considered because most of the cases have been happened in poor developing countries, plus diseases involving diarrhea, which tend to be treated as curable in developed countries. Of these tropical and emerging infectious diseases, we will lay concepts of a new strategy in a comprehensive manner to control and overcome those diseases which have currently become global issues or major impediments to development, and work on research and development of innovative technology essential for the implementation of our strategy. Moreover, through this process, we will foster promising experts who can play a leading role in the future of this research area.



Department of Virology

This Department has been conducting basic and applied research on mosquito-borne flaviviral diseases such as Japanese encephalitis (JE), dengue fever (DF)/dengue hemorrhagic fever (DHF), as well as SARS virus.

Analysis on the structure and function of JE and dengue viral genome

Nucleotide sequence analysis and molecular expression of JE and dengue viral genome have been carried out together with long PCR techniques in order to study molecular epidemiology, epitope analysis, biological activity of nonstructural proteins, and virulent viral gene responsible for viral pathogenesis.

Analysis on apoptosis induced by flavivirus infections.

Flavivirus infection induces apoptosis of the infected cells. Characterization of apoptosis and its relation to pathogenicity has been studied in cell line and animal model.

Development of rapid diagnosis of flaviviral diseases

Viral genome detection and identification by PCR and LAMP methods, preparation of diagnostic antigen from infected cell culture fluid, and simplification of IgM antibody detection have been carried out.

Research on emerging viral infectious diseases

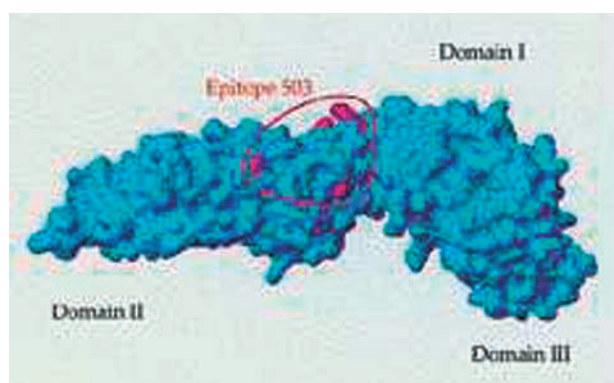
Studies on the development of diagnostic methods and epidemiology on SARS virus, Nipah virus and H5N1avian influenza virus have been conducted in Viet Nam and other countries in the South East Asia.

Activities as a WHO Collaborating Center

Dr. S. T. Han, then Regional Director of WHO Western Pacific Region (WPR) designated the Department of Virology, Institute of Tropical Medicine, Nagasaki University as a WHO Collaborating Cen-

ter for Reference and Research on Tropical Viral Diseases on 23 Nov. 1993. In 2003, epidemiological and virological studies on SARS were added to its research activities. The Department was redesignated as a WHO Collaborating Center for Reference and Research on Tropical and Emerging Virus Diseases on 3 Feb. 2008 by Dr. Shigeru Omi, former Regional Director of WHO/WPR. The Department has received WHO fellows from Vietnam, Fiji, and the Philippines, and dispatched WHO short-term consultants on the activities relevant to its terms of reference. Dr. Kouichi Morita was dispatched to WHO/WPRO and was appointed as Regional Adviser on Communicable Diseases for the Western Pacific Region from 16 May 1995 to 15 May 1998. Dr. Futoshi Hasebe was dispatched to the WHO Western Pacific Regional Office to collaborate in the global emerging infectious disease control program from March 2004 to March 2006.

Professor	Kouichi Morita
Professor	Tetsu Yamashiro
Professor (Project)	Futoshi Hasebe
Assistant Professor	Shingo Inoue
Assistant Professor (Project)	Toru Kubo
Assistant Professor	Yu Fuxum
Assistant Professor	Takeshi Nabeshima
Assistant Professor	Daisuke Hayasaka
Assistant Professor	Genichiro Uechi
Assistant Professor	Kozue Hotta
Assistant	Kazumi Jodai
Assistant	Takako Chiba
Staff	Melba Gidaya
Assistant	Miki Masuda
Assistant	Ayumi Sashikata
Graduate student	Hitomi Kinoshita
Graduate student	Guillermo Posadas Herrera
Graduate student	Dinh Tuan Duc
Graduate student	Lyre Anni Espada Murao
Graduate student	Nguyen Dong Tu
Graduate student	Kenta Okamoto
Graduate student	Ryo Yoshikawa
Graduate student	Mya Myat Ngwe Tun
Research Student	Muhareva Raekiansyah



Newly identified JE neutralizing epitope 503



P3 level laboratory

Department of Bacteriology

Our major research interest is to elucidate the etiologic agents isolated from pathogenic bacteria related to the worldwide emerging and reemerging diseases and to know the virulence mechanisms of bacterial pathogens.

Helicobacter pylori is a bacterial pathogen found in the stomach mucosa of more than 50% of the world population and more common (over 80%) in developing and tropical countries. Infection with *H. pylori* plays a major role in the development of chronic gastritis and peptic ulcer, and is a risk factor for gastric cancer. Pathogenic strains of *H. pylori* secrete a potent protein toxin, a vacuolating cytotoxin, termed VacA, which causes progressive vacuolation of epithelial cells and gastric injury. We found that VacA induces multiple effects on epithelial cells, including mitochondrial damage [1] and apoptosis [2]. These actions of VacA appear to result from activation of cellular pathways, independent of those leading to vacuolation. Similarly, VacA-induced phosphorylation of G protein-coupled receptor kinase-interactor 1 (Gir1), which may be responsible for epithelial cell detachment caused by VacA, leading to peptic ulceration [3], and VacA-induced activation of p38/ATF-2-mediated signal pathway [4] are independent of VacA effects on cellular vacuolation.

Analysis of VacA receptors provided new insights into the molecular basis of VacA function. We reported that two VacA proteins, termed m1 VacA and m2 VacA, which were defined by sequence differences in the middle of the molecules, interacted with target cells by binding to two types of receptor-like protein tyrosine phosphatases (RTPs), i. e., RTP α and RTP β , resulting in toxin internalization and vacuolation of the human gastric adenocarcinoma cell lines AZ-521 and G401 [5, 6, 7]. By analysis of the pathological responses of wild type and RTP β -deficient mice to oral administration of

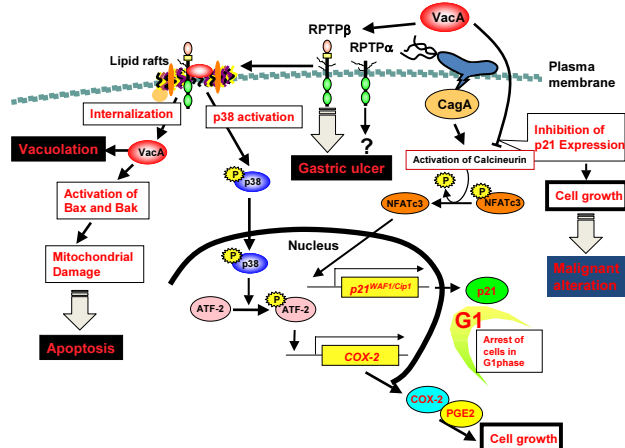
VacA, we found that RTP β functions as a receptor for VacA and produces the disease associated with VacA toxicity including gastritis and gastric ulcer [3]. Receptor-dependent translocation of VacA to lipid rafts is critical for signaling pathways leading to its toxicity [8, 9, 10].

To further elucidate the potential mechanism of how *H. pylori* establishes infection, we also investigate the host-parasite relationships of *H. pylori*, focusing on VacA as well as CagA, which is an effector protein injected by its type IV secretion system into host cells. Consistent with suppression of nuclear translocation of nuclear factor of activated T cells, NFAT, in Jurkat T cells, VacA counteracted CagA-induced activation of NFAT in AGS cells, suggesting that the two major *H. pylori* virulence factors inversely control NFAT activity [11]. Deregulation of NFAT, either positively or negatively, may contribute to cellular dysfunctions that underlie diverged clinical manifestations caused by *H. pylori* infection.

References: [1] Microb. Pathog. 31:29-36, 2001, [2] J. Biol. Chem. 281: 11250-11259, 2006, [3] Nat. Genet. 33: 375-381, 2003, [4] J. Biol. Chem. 279: 7024-7028, 2004, [5] J. Biol. Chem. 278:19183-19189, 2003, [6] J. Biol. Chem. 279: 51013-51021, 2004, [7] Cell Microbiol 7: 1285-293, 2005, [8] Infect Immun. 74, 6571-6580, 2006, [9] Infect. Immun. 75:4472-4481, 2007, [10] J. Immunol. 180: 5017-5027, 2008, [11] Proc. Natl. Acad. Sci. USA. 102: 9661-9666, 2005.

Professor
Senior Assistant Professor
Assistant professor
Assistant professor
Technologist
Assistant
COE Technician
Assistant

Toshiya Hirayama
Akihiro Wada
Masahiko Ehara
Masayuki Nakano
Mamoru Iwami
Kayo Maeda
Asami Fujii
Misuzu Hashiguchi



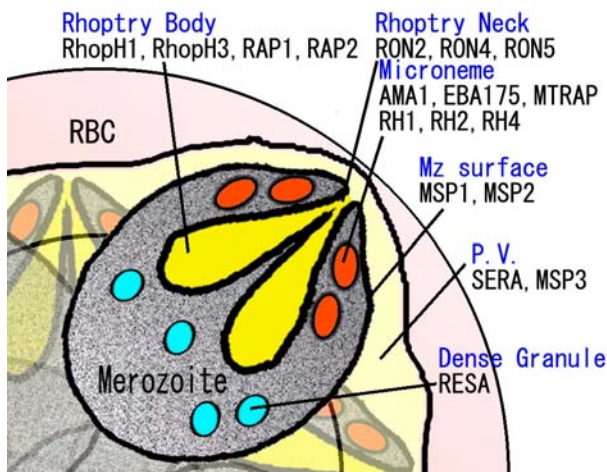
Virulence mechanism of *Helicobacter pylori* vacuolating cytotoxin, VacA.



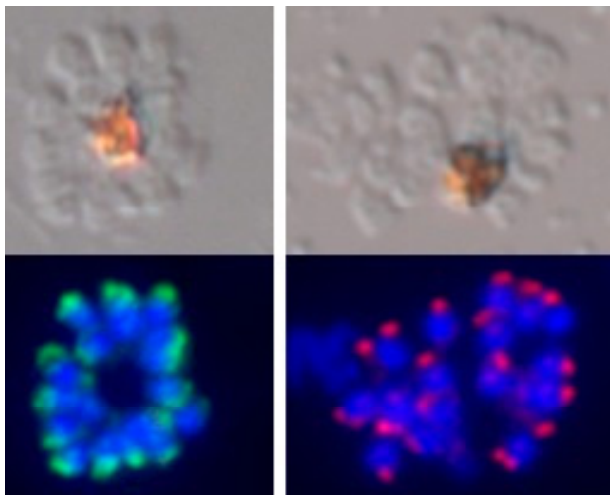
Laboratory

Department of Protozoology

Malaria is responsible for a huge burden of death and disease in large areas of the tropical and sub-tropical world. Unfortunately, those countries hardest hit by the disease are often amongst the poorest. Despite continuing efforts, there is still no effective vaccine against the disease. In order to design and implement effective disease intervention strategies, we believe that one of the key priorities in malaria research should be the strengthening of our understanding of the basic biology of the parasite. We are currently investigating some fundamental aspects of the parasite's life cycle, such as the mechanisms behind erythrocyte invasion and the phenomenon of cytoadherence of parasite-infected erythrocytes. In addition, we are also conducting research aimed at elucidating the intracellular survival strategy of *Trypanosoma cruzi*.



Schematic of the malaria merozoite and its invasion-related molecules.



Newly identified malaria proteins were localized to the apical end of the merozoites. Blue is parasite nucleus, green and red are the location of the identified proteins. Upper panels are DIC images of the malaria parasite.

We are actively pursuing the following lines of investigation:

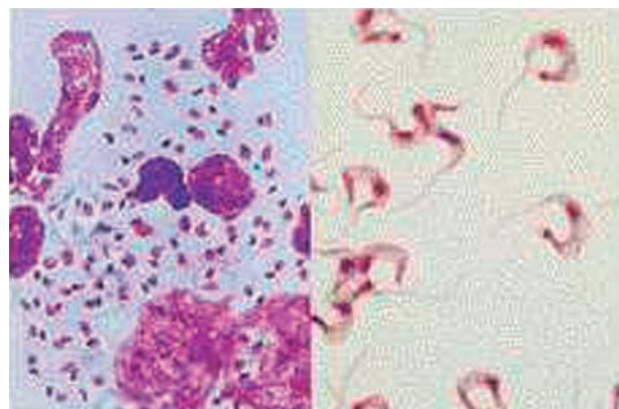
1. Malaria

- 1) The molecular basis of host cell invasion by parasites
- 2) The molecular basis of cytoadherence of parasite-infected erythrocytes
- 3) Identifying parasite antigens that may be important immune targets
- 4) How different malaria parasite species interact in the host
- 5) Prevalence, origins and population genetics of African *Plasmodium vivax*
- 6) Molecular epidemiology of *P. falciparum* malaria in endemic countries
- 7) Survival strategies of malaria parasites in the host

2. Trypanosoma

- 1) The function and expression mechanism of trans-sialidase
- 2) The environmental adaptation mechanisms employed by different *Trypanosoma* species
- 3) The modification of infected host-cells by *Trypanosoma cruzi*

Professor	Osamu Kaneko
Senior Assistant Professor	Haruki Uemura
Assistant Professor	Shusuke Nakazawa
Assistant Professor	Kazuhide Yahata
Assistant Professor	Richard Culleton
Assistant Professor	Miako Sakaguchi
Assistant	Miki Kinoshita
Assistant	Nozomi Hayashida
COE Technician	Yuko Ichimaru
Assistant	Sheng Paul Su
Graduate Student	Akikocristina Salati
Graduate Student	Morakot Kaewthamasorn
Graduate Student	Jean Seme Fils Alexandre
Graduate Student	Xiaotong Zhu
Graduate Student	Megumi Inoue
Graduate Student	Takaya Sakura
Graduate Student	Phonepadith Xangsayarath



Amastigotes (left) and trypomastigotes (right) of *Trypanosoma cruzi*.

Department of Parasitology

Infectious Diseases are still a huge menace to human health and continue unabated in tropical areas under conditions of poverty and the unique natural and social environments. Many parasitic diseases infect humans for long periods of time without killing them, giving rise to tremendous social and/or economic loss. We would like to develop deep insight into parasitic diseases and the surrounding factors from various points of view through both field and laboratory studies. Our goal is to contribute to new knowledge and to provide an enthusiastic environment for the training of the future generation of investigators.

Target diseases of our studies

We have been carrying out both field and laboratory studies on several of the most important helminthic diseases, including schistosomiasis, filariasis and intestinal helminthiasis and on important but neglected protozoan diseases such as amoebiasis, leishmaniasis and trypanosomiasis.

1) Schistosomiasis

Since 1981, the research project on *Schistosoma haematobium* has been carried out in Kwale, Kenya, in cooperation with Kenya Medical Research Institute (KEMRI). We examined cercarial concentration of *S. haematobium* in natural water and the ecology of *Bulinus globosus*, an intermediate host of *S. haematobium*, and then tried to prevent transmission through snail control. Inhabitants' water contact and their knowledge, attitude and practices (KAP) about the infection have also been studied, and we have made great efforts on the spread of knowledge about health and hygiene as well as supplying piped water. We developed and modified methods for diagnosis of schistosomiasis, for example, urine ELISA, modified COPT and used urinary reagent strips, and have been investigating the prevalence of urinary problems, prevalence of bladder cancer and liver fibrosis, and morbidity using ultrasound in the community. In the laboratory, we have been maintained *S. mansoni*, *S. haematobium*, and several species of intermediate snails. We have elucidated i) the regulatory mechanism of swimming behavior of miracidia and ii) the penetrating mechanisms of cercariae into skin. Currently, iii) we are developing a new strategy for control of schistosomiasis by releasing huge number of decoy snakes, and iv) have just started to elucidate Th2 initiation mechanism during Schistosomiasis.

2) Filariasis

A research project on filariasis was carried out

in Kwale, Kenya, in cooperation with KEMRI between 1990 and 1996. Transmission potential and morbidity were studied. Mass-chemotherapy with combination of DEC and NaHCO₃ was evaluated. In the laboratory, *Brugia malayi*, *B. pahangi* and the vector mosquito, *Aedes aegypti* have been maintained for many years. We have screened a panel of plant extracts for antifilarial activity and developed a simple and sensitive method for determination of serum concentration of ivermectin (IVM) and diethylcarbamazine (DEC). We were the first to report that infective larvae of *B. pahangi* show chemotaxis to serum.

3) Amoebiasis, Leishmaniasis etc.

Genetic epidemiology and cohort studies on amoebiasis and leishmaniasis are carried out in cooperation with the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B.) and the University of Virginia. Field sites include Dhaka and rural areas of Bangladesh. In addition to genetic factors, we aim to elucidate various environmental factors that determine and/or influence the outcome of the infection. In the laboratory, we study host defense mechanisms against *Leishmania major*, *L. donovani* and *Trypanosoma cruzi*, and in the process, have elucidated the function of the IL-12 cytokine family such as IL-27/WSX-1 during infection. After we developed animal models of intestinal amoebiasis together with Prof. Houpt at University of Virginia, we are now devoting ourselves to the study of pathogenesis of *Entamoeba histolytica* and host defense mechanisms to *E. histolytica*.

Professor
Assistant Professor
Assistant Professor
Technologist
Assistant
Assistant
Assistant

Shinjiro Hamano
Kanji Watanabe
Yoshinori Mitsui
Mitsumasa Miura
Masako Hayashida
Satomi Tominaga
Fumie Hara



One of our field site in Nepal, South Asia

Department of Clinical Medicine

Main targets of research activities in the Department of Internal Medicine are tropical infectious diseases, respiratory infectious diseases and HIV/AIDS, all of which causes severe disease burden in the tropics. We conduct various basic scientific research using animal models in Nagasaki and clinical epidemiology research in the oversea through international collaboration. Specific research activities are described as follows:

1. Respiratory Infections

Our goal is to better-understand mechanisms causing severe and treatment-refractory pneumonias at molecular levels toward development of a novel treatment strategy. We hypothesize that patients with severe and treatment-refractory pneumonia has an impaired process in inducing the cessation of inflammation and re-construction of damaged tissues. We, particularly, focus on the function of macrophage which is responsible for clearing apoptotic cells from the inflammation site using a mouse pneumonia model. We have also developing a rapid and comprehensive assay to identify multiple pathogens causing respiratory infections and an assay to quantify bacterial load, which are being applied for several clinical studies in and outside Japan.

2. Pediatric Infectious Diseases in Vietnam

We have, so far, conducted studies on clinical and bacteriological diagnosis, antimicrobial susceptibility and molecular epidemiology in collaboration with National Institute of Hygiene and Epidemiology. Since 2005, we further collaborated with International Vaccine Institute and started a large-scale of census survey targeting all residents in Nha Trang city and its adjacent Nin Hoa district in the middle part of Vietnam. During the census, we also collected information regarding environment and diseases burden (particularly pneumonia, diarrhea, dengue fever), health utilization pattern. Since 2006, a research clinician has been dispatched from our department and monitoring all pneumonia cases admitted to the pediatric ward at Kan Hoa General Hospital in the above city. So far over 1600 pneumonia cases have been registered and we demonstrated that environmental tobacco exposure is a

risk factor for child pneumonia admission. We also determined pathogen specific incidence rates and demonstrated seasonality of respiratory infection in Vietnam.

3. HIV cohort studies in northern Thailand

In collaboration with National Institute of Health, Thailand and National Institute of Infectious diseases, Japan, a large scale of cohort study targeting HIV-infected individuals and their spouses has been established and maintained in Lampang Hospital, northern Thailand. So far, over 1200 people have participated. The main objectives of this cohort are to understand mechanisms of resistance to HIV infection among HIV-exposed but uninfected spouses living with HIV-infected patients and mechanisms of slow-progression among HIV-infected slowprogressors. These studies are being conducted in close collaboration with Thai counter parts and international experts in various fields such as hostgene polymorphisms, molecular immunology, molecular epidemiology and virology. Furthermore, based on this field setting, we are also conducting studies on frequencies of opportunistic infection, the effect of anti-retroviral drug therapy, and social need for children born to HIV-affected parents.

Department of Clinical Medicine

Professor	Koya Ariyoshi
Associate Professor	Konosuke Morimoto
Assistant Professor	Kei Miyagi
Assistant Professor	Laymyint Yoshida
Assistant Professor	Hiroshi Yoshino
Assistant Professor	Hikaru Sato
Research Associate	Kiwao Watanabe
Visiting Researcher	Tomoyuki Maekawa
COE Research Fellow	Naho Tsuchiya
COE Research Fellow	Mugen Ujiie
COE Research Fellow	Tomoko Abe
Assistant	Mitsuyo Kirie
Assistant	Rina Shiramizu
Assistant	Rika Nogawa
Graduate student	Vu Thi Thu Huong
Graduate student	Masahiko Mori
Graduate student	Youko Tsumori
Graduate student	Yoshirou Yamashita
Graduate student	Kazuhiko Koyama
Graduate student	Yusuke Shimakawa
Graduate student	Sugihiro Hamaguchi
Graduate student	Takayuki Oike



Khanh Hoa General Hospital (Vietnam)



P2 Level Laboratory

Department of Immunogenetics

This department is focusing on the pathogenic genetic factors of the host and the parasite in the most important tropical infectious diseases by using immunology and genetics.

Research activities:

To clarify the molecular mechanisms in the protective and/ or pathogenic host response to human pathogens such as Dengue Virus, TB, Malaria, Trypanosoma cruzi, Schistosoma, and Filaria, the following research projects are going on in our laboratory.

1. Malaria

- 1) Genetic susceptibility to severe forms of malaria (cerebral malaria, severe anemia) is analyzed by case-control study in South East Asia, South Pacific and West Africa.
- 2) Malaria vaccine development using the immunological characteristics of resistant persons living in the endemic area in Asia and West Africa.

2. Schistosomiasis

- 1) Immunological regulation of the pathogenic anti egg response in the resistant and susceptible persons, to post-schistosomal liver fibrosis in China and Philippines.
- 2) Miniature pig schistosomiasis as a human model.
- 3) Vaccine development for schistosomiasis japonica and masoria using schistosomula antigens.
- 4) Production of the new diagnostic Kit for active infection.

3. Chagas disease

- 1) Genetic susceptibility to different clinical types of chronic Chagas disease, namely, indeterminate, cardiac, and digestive forms, is analyzed by case control study in Bolivia where Chagas disease is still highly endemic.
- 2) Genetic analysis of Trypanosomes in Latin Americas by using local isolates and molecular biology.

Collaborations:

The research here is performed based on the

well arranged collaborative projects with the following facilities.

1. Malaria: Thammasat University (Thailand), Noguchi Memorial Medical Research Institute (Ghana), Institute of Medical Research (Malaysia), Karolinska Institute (Sweden), Ehime University (Matsuyama), WHO/TDR (Geneva Switzerland)
2. Schistosomiasis: Jiangxi Provincial Institute of Parasitic Diseases (China), Jiangsu Provincial Institute of Parasitic Disease (China), Univ. Philippines and RITM (Manila, Philippines), Tokyo Medical Dental Univ. (Tokyo)
3. Chagas Disease: Center of Tropical Medicine and Hospital Japonés (Bolivia), IICS University of Asuncion (Paraguay)
4. Dengu virus
 - 1) Pathogenesis of the DHF (Dengue Hemorrhagic Fever)
Host factors will be detected by the Population genetic analysis of the patients with DHF and non DHF.

Staffs

Professor	Kenji Hirayama
Professor	Michio Yasunami
Associate Professor	Nobu Ohwatari
Senior Assistant Professor (Project)	Mihoko Kikuchi
Assistant Professor	Nguyen Huy Tien
Assistant Professor	Hiroki Shibata
Assistant Professor	Shuaibu Mohammed Nasir
Assistant	Junko Hayashima
Assistant	Hitomi Horie
Assistant	Maki Jyoshita
COE Technician	Kaori Kamei
Assistant	Makiko Okamoto
Graduate Student	Akiko Takaki
Graduate Student (COE Technician)	Akiko Yamazaki
Graduate Student	Helegbe Gideon Kofi
Graduate Student	Tran Thi Ngoc Ha
Graduate Student	Del Puerto rodas Ramona Florencia
Graduate Student	Daniel Boamah
Graduate Student (COE researcher)	Cherif Mahamoud Sama
Graduate Student (COE researcher)	Dang My Nhi
Graduate Student (COE researcher)	Lam Quoc Bao
Graduate Student (Visiting researcher)	Edelwisa Segubre Mercado



Department of immunogenetics



Experiment scenery

Department of Host-Defense Biochemistry

Researches in our laboratory are focused on the molecular regulations of the phagocyte NADPH oxidase system that generates active oxygens essential for killing invading microbes.

Selective expression mechanisms for gp 91^{phox}, a core component of the oxidase

The phagocyte NADPH oxidase is composed of membrane-integrated flavocytochrome b 558 containing gp 91^{phox} and p 22^{phox}, and cytosolic components such as p 47^{phox} and p 67^{phox}. Upon phagocytotic stimulation, cytosolic factors move to membrane to make an active complex with the flavocytochrome. Based on genetic analysis of CYBB, the gene encoding gp 91^{phox}, in a patient with chronic granulomatous disease (CGD), we found that PU.1, a transcriptional activator, bound to gp 91^{phox} promoter position centered to bp -53 was important for the expression of gp 91^{phox} in neutrophils, monocytes, and B lymphocytes, but not in eosinophils. On the other hand, GATA-1 bound to a position centered to bp -98 had an important role in the expression of the gene in eosinophils.

A novel GT-mismatch binding protein

In the analysis of a cis -element of gp 91^{phox} promoter, we found a novel GT-mismatched DNA binding protein. An addition of unlabelled competitor homoduplex with G/C at bp -177, generated, but not erased, a strong 'supershifted' band in EMSA using the labeled probe with A/T at bp -177. Newly paired heteroduplex with the unlabelled upper strand with G at bp -177 and the labelled lower strand with T at the same position recruited nGTBP. This protein strictly required TRTGNB (R=purine, N=any base, B=not adenine, G paired with T) and 14-mer or longer for binding. G can be replaced by deaminated A, namely, hypoxanthine, suggesting deaminated C-6 is essential for nGTBP binding. Deamination of nucleotide bases are increased by high temperature and the repair of deaminated portions of DNA would be more important in tropical area than other areas. Transitions appreciably occurred more at TRTGNB

sites than at other sites in tumor suppressor protein p 53 exons, suggesting this particular sites were fragile in tumor-prone cells. Relative frequency of esophageal cancer due to transitions at p 53 non-GpG sites in Brazilian mate-drinkers was relatively higher than that in world-wide patients. Cloning and purification of this nGTBP are now urgent issues in our laboratory.

Assistant Professor Yoshito Fujii



Department of Pathology

Main purpose of our research is fundamentally pathological investigation of tropical diseases, mainly infectious diseases, focused on oncogenic microbes, and establishes the basis of their treatment and prevention. Although many investigators have proposed oncogenesis due to inflammation associated cancer development, the mechanisms underlying the relationship between chronic inflammation and cancer still remain unresolved. Therefore, our research focuses on the potential role of oncogenic microbes in the development of cancers, highlighting the recent advances in the understanding of the molecular mechanisms.

Inflammation and cancer

The proportion of total cancer deaths attributable to infectious agents is estimated to be 20% to 25% in developing countries and 7% to 10% in industrialized countries. A causal relationship between chronic inflammation and cancer is widely accepted. Specifically, there is a strong association between tumor viruses and the development of human cancers. Both DNA and RNA viruses have been reported to be capable of causing cancer. Epstein-Barr virus (EBV), human papillomavirus (HPV), hepatitis B virus (HBV), and Kaposi's sarcoma associated herpesvirus (KSHV) are DNA viruses known to lead to the development of cancers. Cancer inducing RNA viruses include Hepatitis C virus (HCV) and human T lymphotropic virus type-1 (HTLV-1). EBV is associated with Burkitt's lymphoma, nasopharyngeal carcinoma, Hodgkin's lymphoma and non-Hodgkin's lymphoma; HBV and HCV viruses with hepatocellular carcinoma; HTLV-1 with adult T-cell leukemia/ lymphoma; and HPV with cervical cancer, penile cancer, anal cancer, oropharyngeal cancer, and skin cancer. In developing countries, 15% to 20% of the global cancer burden can be linked to these infections. An additional 5% can be attributed to bacterial infection (*Helicobacter pylori*) and parasitic infections (*Schistosoma*, *Opisthorchis*, *Clonorchis*).

Histopathological characteristics of chronic in-

flammation include the predominance of lymphocytes and macrophages. In 1863, Virchow hypothesized that malignant tumors occurred in the chronic inflammation lesions associated with lymphocyte infiltration. Activated lymphocytes and macrophages are interactive in releasing inflammatory mediators such as cytokines, chemokines, growth factors, and survival factors interact with specific cell surface receptors resulting in amplified immune reactivity.

The mechanisms of oncogenesis associated with infection and inflammation have not been elucidated. However, many oncogenic mechanisms have been proposed for infection and inflammation; for example, 1) Signal transduction: Toll-like receptors (TLR) for pro-inflammatory cytokins, such as tumor necrosis factor- α (TNF- α) and interleukin-1 (IL-1), IL-6, IL-8, and IL-18 leads to activation of many important signaling pathways. The other pro-inflammatory gene products are matrix metalloproteinase-9 (MMP-9), vascular endothelial growth factor (VEGF), cyclooxygenase-2 (COX-2), and 5-lipoxygenase (5-LOX). It is well accepted that the NF- κ B group of transcription factors play a still more important role in inflammation. 2) Direct action of viral proteins and host cells: Products of binding viral proteins and human genes lead to alteration of host cells. Tumor-suppressor gene products of retinoblastoma protein (pRb) and p53 are inactivated by interaction with products of viral proteins. For example, human papillomavirus (HPV) E6 and E7 proteins are oncogenic factors in HPV related cancers. 3) Immunosuppression: Human immunodeficiency virus (HIV) causes immunosuppression, which leads to Kaposi's sarcoma and/or malignant lymphomas. 4) Production of reactive oxygen species (ROS) and reactive nitrogen species (RNS). Prolonged activation of inflammatory cells generates ROS and RNS that can damage host DNA, which can contribute to carcinogenesis. Activation of NF- κ B is also involved cancer development and progression. Therefore, our research focuses on the molecular players during the development from chronic inflammation to cancer.

Assistant Professor Masachika Senba



Department of Preventive Medicine and AIDS Research

This department was newly added to the institute in 1978 as a research division open to visiting professors from other universities and institutes. It is run by concurrent research staff for the present. We have planned and started from August of 2002 a series of fundamental research to answer the question how and what mechanisms human immunodeficiency virus and murine leukemia virus enter into host cells. In addition, we are studying the application of these retrovirus to human gene therapy.

Study on the mechanism of viral entry into host cells by retroviruses

Human immunodeficiency virus (HIV) is known to be a causative agent for acquired immunodeficiency syndrome. After the HIV recognizes CD4 and chemokine receptor, for example CXCR4, it enters into target cells mediated fusion between virus envelope and cell membrane. Murine leukemia virus (MLV) recognizes CAT1 as the infection receptor, and enters into host cells by same manner. It is most likely that the environment around the receptors influences the infection efficiency. In this context, we are studying the effect of receptor glycosylation and lipid factors proximal to the receptor on the HIV and MLV infection.

On the other hand, there are some evidences showing that actin-dependent clustering of the receptors is involved in the retrovirus infection. The receptors, however, do not directly associate with ac-

tin. We try to identify the cellular molecule that functions as a linker between the receptor and actin.

Application of HIV envelope gene to gene therapy

HIV enters into target cells by fusion between virus envelope and cell membrane. This reaction is catalyzed by envelope glycoprotein encoded by the viral genome. When the envelope gene is introduced to susceptible cells expressing CD4 and CXCR4, syncytium formation is induced by its membrane fusion activity, and die. Recently, CD4-independent HIV has been isolated. When the envelope gene of the CD4-independent HIV is introduced to cells expressing CXCR4 but not CD4, syncytium and cell death was induced. It has been reported that CXCR4 is up-regulated in mammary tumor. This suggests that the CD4-independent HIV envelope protein specifically induces cell death of mammary tumor cells. We are studying the application of the CD4-independent HIV envelope as a novel therapeutic gene for mammary tumor.

Visiting Professor	Naoki Yamamoto
Visiting Associate Professor	Hironori Sato
Assistant Professor	Yoshinao Kubo
Assistant	Naomi Yamatani



Laboratory for biochemical research



Laboratory for biochemical research

Department of Eco-epidemiology

April 2008, the Research Center for Tropical Infectious Diseases was reorganized and transformed into four groups i.e. two departments in the Research Field of Environmental Medicine, Tropical Medicine Museum and the Kenya station of Overseas Research Stations.

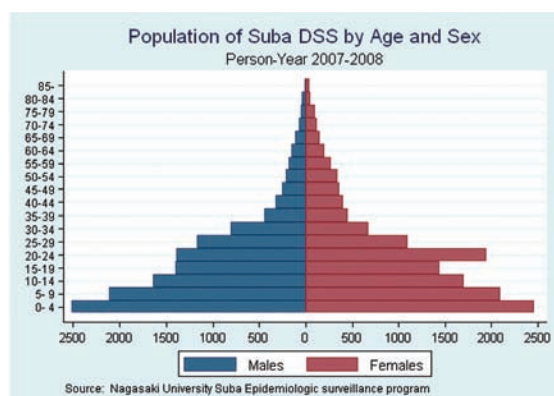
“Eco-epidemiology” department is one of the new two departments in the Research Field of Environmental Medicine.

However, the staffs do not work in the department at present and mainly work for the Kenya Research station of Overseas Research Stations and for the Tropical Medicine Museum.

Professor	Masaaki Shimada (Kenya Station)
Professor	Masahiro Horio (Museum)
Professor	Satoshi Kaneko (Kenya Station)
Professor	Yoshio Ichinose (Kenya Station)
Postdoctoral Fellow	Michiko Ogino
COE Research Fellow	Rie Isozumi
COE Research Fellow	Hu Jinping

The concept of eco-epidemiology is based on the view of recognizing tropical diseases as a system of infection. The aim of our research is to understand the process of interaction between microorganisms, vectors and human beings in the system.

Human beings and vectors, so-called hosts as a niche of pathogens, exist not statically but dynam-



The population pyramid of Suba area.

cally in time and space. In addition, there is an infinite diversity in the characteristics of hosts. We study how microorganism survive, maintain, proliferate, diminish, disappear and emerge through the niches.

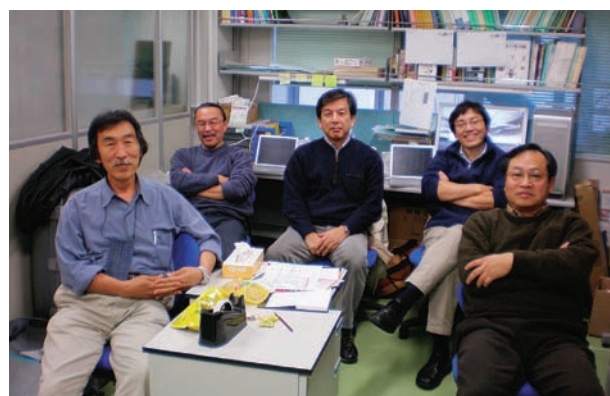
The ultimate purpose of the department is to form a theory for a better understanding of the inter-relationship between hosts and pathogen and its consequences, diseases.



Prof. Ichinose, collecting stool samples from cholera patients in an isolation ward.



Prof. Horio, Commentating on tropical diseases at the museum.



Staff (Left to right : Shimada, Minakawa, Horio, Kaneko and Ichinose)

Department of International Health

Department of International Health has started its activities since 2008, following the internal reform of Institute of Tropical Medicine. Department of International Health has its basis on Research Center for Tropical Infectious Diseases (RECTID) of Institute of Tropical Medicine established in 2001, Information and Reference Center in 1997, and Reference Center in 1994.

It says that RECTID, a precursor of our department, had following three activities; 1) developing the museum of tropical medicine, 2) collecting and disseminating information on tropical infectious diseases and 3) promoting joint research projects and doing epidemiological studies. Out of which, Department of International Health takes over research activities and adds to its mandate an international collaboration as a social responsibility anew.

Thus, Department of International Health, as a newly established department, has two pillars, e.g. research and social responsibility.

Research was composed of three units; 1) research on infectious diseases in ecosystem, 2) research on the environment including climate change and Asian dust related to health, 3) research on biological evolution of microorganisms from the adaptation or fitness view point. The umbrella concept or key word linking above three research units is to reconstruct infectious diseases “temporally” and “spatially” alike. Infection is the biological interaction between hosts and microorganisms. In other words, host behavior, social structure as well as culture per se affect microorganisms in fitness and adaptation whereas microorganism has impact on its hosts. Based on that perception, our department aims to get more detailed understanding and insight on infectious diseases.

Another pillar is a social responsibility. Now that



even profit oriented organizations are required to have its corporate social responsibility, no need to say for academia or university. Out of the name of our department, it must be nothing but contribution to international health or people's health in resource limited settings.

Our department raises following three activities as international contribution; advocacy on international health at national and international level, health promotion activities and empowerment at the community/ grassroots' level and emergency relief.

What our department thinks of important in those activities is to make solidarity in order to improve people's health and contribute to people's sustainable development. It is our department's goal.

Professor	Taro Yamamoto
Associate Professor	Junko Okumura
Assistant Professor	Toshihiko Sunahara
Assistant Professor	Masahiro Hashizume
Visiting Researcher	Guoxi Cai
Visiting Researcher	Liang Qin
Visiting Researcher	Zhuo Zhang
Visiting Researcher	Eiko Kobori
Assistant	Kyoko Sakitani
COE Research Fellow	Katsuyuki Eguchi
Assistant	Hidefumi Fujii
Assistant	Satsuki Shiraishi
Graduate Student	Osuke Komazawa
Graduate Student	Keiko Akahane
Graduate Student	Kounnavong Sengchanh
Graduate Student	Ohki Mika
Graduate Student	Md.Manirul Islam
Graduate Student	Ubydul Haque



Department of Global Health Development Policy Sciences

Specific Features of the Department

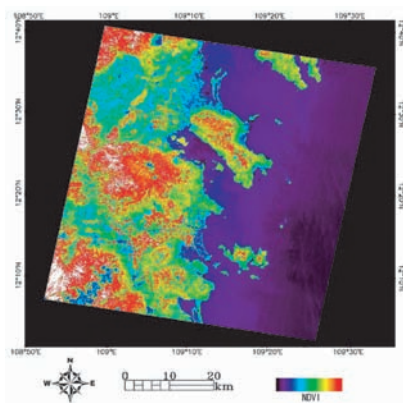
This Department covers under the 14th tenure interdisciplinary field of Environmental and Social Medicine related to health services and social welfare problems in developing countries.

Interdisciplinary approach includes studies in Social Sciences and Humanities. Further, methods and actual means of international cooperation toward developing countries has been sought to utilize in order to promote inter-departmental linkage for information accumulated with specific analysis and professional response to the public, particularly in the field of infectious diseases diagnosis and control.

Under this context, basic and applied research have been carried out in the following prospective themes from the view point of environmental and social aspects for the purpose of promoting assistance to minimize health problems in tropical areas:

Area of Research Activities:

1. Study and analysis on social (incl. life style, political and economical) background which regulates frequency / areas / accumulation of diseases of the presence of epidemics.
2. Study on the effect of individual and social environment toward endemic and epidemics.
3. Standardization of human security measures in the field of health services from the view points of nutrition and 3 Es ie.economy, environment and education.
4. Study on control of communicable diseases among the regional and international health care programs.
5. Study on quantitative and qualitative values of medical and health services under the ODA ie. Official Development Assistance programs by Japanese government.
6. Feasibility study on comprehensive information filing and network system for the sake of promoting health and social welfare services in developing countries, by epidemics, by regions, by administrative measures.



An example of the distribution map of the environmental index

7. Reformation and coordination of health manpower training program / system to meet the need of tropical area in connection with Risk Management.
8. Comparative studies on the control of emerging infectious diseases in tropical Asia such as West Nile and SARS or Avian Flu.
9. Study and analysis of the AIDS orphans care system in Thailand.
10. Comparative Studies on asymptomatic intestinal protozoa infections between Japan and Mexico.

Specific themes of joint cooperative research designated to the Department under the scheme of Research Institute for Nationally Joint-Use are listed below. The Technical and Management Committee recommended that interdisciplinary research collaboration should be realized from the viewpoint of middle and long-term range and managed not only by single department but also by the whole Institute as one of the important mandates.

Joint Research projects themes:

- a) Nutritional approach to improve health conditions in developing countries
- b) Analysis on socio-environmental factors of the control and prevention of infections using the remote sensing and GIS.

Noted results of research projects have often been integrated and fully utilized in the forms of seminar or symposium for covering valuable themes.

We participated in various kinds of national or international meetings regardless of specific field barrier.

Professor	Tsutomu Mizota
Assistant Professor	Kensuke Goto
Assistant Professor	Takeshi Yoda
Assistant	Rie Ushitani
Assistant	Emi Nakayama
Visiting Researcher	Chizuko Suzuki
Visiting Researcher	Susumu Tanimura
Graduate Student	Kazuo Minematsu
Graduate Student	Mgaywa G.M.D. Magafu
Graduate Student	Etsuko Hatagishi
Graduate Student	Mugen Ujiie
Graduate Student	Nmor Jephtha Christopher
JSPS Ronpaku Fellow	Vu Dinh Thiem



Lecture on 'Development and Aid' in the Master course of Medicine.

Department of Vector Ecology & Environment

Our research interests include anything from ecology to molecular biology of medically important arthropods, particularly mosquitoes that transmit diseases such as malaria and dengue. We are also interested in their relationships with environmental factors and development of environmentally friendly vector control strategies.

1. Dengue vectors

As dengue vectors are extending their geographic distribution, the spread of the disease is being concerned. It has been suspected that the expansion of vector distribution is due to environmental factors such as climate change. We are currently mapping their distributions in Vietnam and Kenya, and examining the relationship with environmental factors. In NyaTrang city, southeast Vietnam, we are examining the key environmental factors that contribute to the spread of the disease.

2. Malaria vectors

Main malaria vectors belong to a group of sibling species, and members within a group are morphologically indistinguishable. We are examining ecological and physiological differences among the members within the *Anopheles gambiae* complex group, the *An. minimus* group and *An. dirus* group as well as their evolution using molecular techniques. In East Africa, we are investigating the geographic distributions of the members of the *An. gambiae* complex. This extensive field survey was designed to understand the effects of climate and the Great Rift Valley on their distributions and evolution.



Stereomicroscopic observation of mosquitoes

3. Vector control measures

The coverage of insecticide treated bed nets has considerably increased in Africa. We are investigating whether local residents properly use and maintain bed nets, and how long bed nets last in western Kenya. We are also investigating the effects of bed nets on the species composition of vectors and their behavior, and monitoring their insecticide resistance. As an environmentally friendly malaria control measure, we are examining the effectiveness of *Bacillus sphaericus* and *Bacillus thuringiensis* var. *israelensis* in villages along Lake Victoria.

4. Detection of virus in mosquitoes

We collaborate with National Institute of Infectious Diseases in Japan and National Institute of Hygiene and Epidemiology in Vietnam to detect new viruses from a variety of mosquito species.

Professor	Masahiro Takagi
Professor	Noboru Minakawa
Associate Professor	Hitoshi Kawada
Assistant Professor	Yukiko Higa
Assistant Professor	Takashi Tsunoda
Assistant Professor	Kyoko Futami
Research Fellow	Kohei Takano
Research Fellow	Shinya Oba
Research Fellow	Yoshihide Maekawa
Assistant	Toshiko Ueno
Assistant	Junko Sakemoto
Assistant	Yuri Sonoda
Assistant	Emiko Kawashima
Graduate Student	Ataru Tsuzuki
Graduate Student	Endan Pujiyati



Ramp traps for collecting mosquitoes

Center for Infectious Disease Research in Asia and Africa

○Kenya Research Station

Outline of the program

The Institute of Tropical Medicine (ITM) has received a government grant for the promotion of research on tropical diseases and emerging and re-emerging infectious diseases. With this special, ample grant of money, ITM established a research station in Nairobi, Kenya. The unique feature of the Nairobi Station's research program is long-term, extensive, and multidisciplinary studies based on the Japan-Kenya collaboration. The program provides training for young researchers both Japanese and Kenyan, and in collaboration with JICA, contributes to the disease control and health promotion in the tropics with the fruits of its research.

Progress of the program

1. Research station in Kenya

The Research Station is now equipped to facilitate bio-medical and epidemiological studies in tropical diseases. A P3 laboratory and Demographic Surveillance System have been prepared.

2. Dispatch of Japanese researchers

Four professors, one is a program leader, and two administrative staff members work in the Kenya Station. They are to be provided with special logistic support by one professor of ITM.

3. Study areas for the long-term and extensive research work

A Demographic Surveillance System (DSS) and a Mosquito Surveillance System (MSS) are in operation in the Suba area in Western Kenya. DSS will be put in the Kwale area on the Coast. A joint

project with JICA (JICA Partnership Program) started in 2009.

4. Studies in infectious tropical diseases

Based on the DSS in Suba, research on malaria and bacterial diarrhea were launched in 2006 and 2007. Study on arbovirus and parasitic diseases started in 2008. In Kwale, research on schistosomiasis was launched.

5. Training program

Under the patronage of JICA and MEXT, Kenyan researchers and doctors were given opportunities to visit ITM and were trained in research on tropical medicine. Professors of ITM served as advisers in the JICA-sponsored International Parasite Control which took place in Kenya.

Program Staff

Leader and Professor	Masaaki Shimada (Kenya Station)
Professor	Noboru Minakawa
Professor	Yoshio Ichinose (Kenya Station)
Professor	Satoshi Kaneko (Kenya Station)
Professor	Masahiro Horio (Tropical Medicine Museum)
Associate Professor	Hitoshi Kawada
Assistant Professor	Kyoko Futami (Kenya Station)
Assistant Professor	Toru Kubo
Research Fellow	Yoshihide Maekawa
Postdoctoral Fellow	Michiko Ogino
COE Research Fellow	Rie Isozumi
COE Research Fellow	Hu Jinping
Administrative Staff	Yukie Saito (Kenya Station)
Administrative Staff	Haruki Kazama (Kenya Station)



Main office of Kenya Research Station
(made in cargo containers)



Staff members (February 2009)

Center for Infectious Disease Research in Asia and Africa

○Vietnam Research Station

Outline of the program

In 2005, the Government of Japan (Ministry of Education, Culture, Sports, Science and Technology) provided special funds to certain grant-winning Japanese universities for the purpose of establishing research centers for emerging and reemerging infectious diseases in order to make joint studies with overseas research institutions. Nagasaki University, one of the recipients, set up Research Centers in Nagasaki and Hanoi, Viet Nam to study clinical epidemiology of emerging and reemerging infectious diseases, including disease ecology, intervention, and protection and prevention, thereby contributing to the control and/or elimination of infectious diseases, which is today's global concern.

The Research Centers have been managed in collaboration with four institutions, the Institute of Tropical Medicine (ITM) of Nagasaki University, the International Medical Center of Japan, Tokyo, the National Institute of Hygiene and Epidemiology (NIHE), Hanoi, and Bach Mai Hospital, Hanoi, with ITM and NIHE playing a major role in the operation. NIHE has the NIHE Nagasaki University Friendship Laboratory in which Japanese researchers are now carrying out infectious diseases research. In Nagasaki, the research projects focus on basic strategic research and product development, and also provide guidance for ethical consideration and determining of perfect strategies to counter any potential infectious disease outbreak.



National Institute of Hygiene and Epidemiology (NIHE)

Meanwhile, the research work in Viet Nam will concentrate on the following areas:

- 1) zoonotic infectious diseases including avian influenza, hanta, nipah virus infection, and rabies;
- 2) vectorborne infectious diseases, including malaria and dengue virus infection;
- 3) fecal-oral infection including rotavirus, norovirus infection, and cholera;
- 4) human to human infection, including acute respiratory infections.

NIHE-Nagasaki University Friendship Laboratory Staff

Leader and Professor	Yoshiki Aoki
Professor	Tetsu Yamashiro
Professor	Futoshi Hasebe
Assistant Professor	Takashi Tsunoda
Assistant Professor	Hiroshi Yoshino
Assistant Professor	Gen-ichiro Uechi
Assistant Professor	Kozue Hotta
Administrative Staff	Yoshio Furuya
Research Assistant	Ngo Khanh Phuong
Research Assistant	Quach Thi Thu Huong
Secretary	Bui Thu Tra



Opening ceremony of the Research Center in NIHE

Center for Infectious Disease Research in Asia and Africa

○Fiji Research Station

The Japanese support to the Pacific Immunization Program Strengthening (J-PIPS) is a 5-year JICA project in 13 South Pacific island countries which aims: to strengthen capacity development in the Pacific island region in the area of immunization services through resource development of EPI management staff, and to improve the quality of EPI services provided. The Institute of Tropical Medicine (ITM), Nagasaki University (NU), is responsible for the administrative management of J-PIPS. J-PIPS commenced operation in February 2005 under the leadership of Dr. Kouichi Morita, Professor and Head, Department of Virology, ITM, NU, as its Chief Advisor. In March 2005, four other professionals were assigned by ITM, NU, to the project office in Suva, Fiji.

The project's two main objectives are: to establish a functioning regional training system for vaccine logistics, cold chain maintenance, safety injection and EPI waste disposal management; and to strengthen the Pacific island countries' EPI program planning and monitoring system of vaccine-preventable diseases, such as poliomyelitis, measles, Hepatitis B and influenzae bacillus.

In line with its capacity building program, since 2005, J-PIPS has conducted annual "regional training" activities in Suva for EPI managers/coordinators and cold chain technicians in collaboration with the Fiji Ministry of Health, WHO and UNICEF. The training provides EPI managers/coordinators and cold chain technicians with updated information and skills training in order for them, subsequently, to conduct country training/s in their respective countries. The regional training offers two courses: EPI management course and Cold Chain maintenance course. After the second regional training, the project welcomed the additional participation of American Samoa, Tokelau and Papua New Guinea. As of November 2008, J-PIPS has trained 154 core trainers from 16 Pacific island countries: 95 nurses and 59 technicians. Successfully, the regional training has developed into the annual focal training activity in the island countries which helps improve skills and knowledge on immunization services in the region. J-PIPS addressed the issue of sustainability of the training activity by developing a regional training mechanism where the Ministry of Health, Fiji will take lead in close collaboration with the other PIPS partner agencies.

Another important component under capacity building is "country trainings" which were organized and focused on EPI service providers and cold chain technicians in relevant countries. At present, a total of 424 nurses and 18 technicians in 14 countries have undergone country training. Furthermore,

the countries and partner international agencies have expressed great appreciation for the relevance and advantages of the in-service training being conducted by J-PIPS for cold chain technicians.

The provision of technology transfer in the area of outbreak response by improving health workers' knowledge and diagnostic skills for EPI targeted diseases is a major component of the project. In 2007 and 2008, through a technology transfer activity, the Department of Virology, ITM, NU, cooperated and provided the Mataika House (Fiji Centre for Communicable Disease Control) skills training on viral diagnostics. Field surveys on the occurrence of target communicable diseases and other project issues are regularly conducted by JPIPS in the 13 South Pacific island countries.

J-PIPS maintains in close communication and collaboration with its international partners, WHO, UNICEF, AusAID, NZAID and SPC, etc. to ensure a sustained maximum degree of effectiveness in terms of technical cooperation. J-PIPS is also a partner member of the Pacific Immunization Programme Strengthening (PIPS) composed of governments of the island countries and international agencies actively collaborating to improve immunization services in the islands. Annually, a PIPS workshop is held and in 2009, representatives and delegates from 12 Pacific island countries, international partner agencies and organizations participated in the 5th PIPS Workshop held in Nagasaki City from 11 to 15 May.

Significantly, under the expert management by the Department of Virology, ITM, NU, the J-PIPS project administratively and technically serves as an avenue for communicable disease control and response activities in the Pacific island region, particularly with regard to vaccine-preventable diseases, thus, is in conformity and consistent with the ITM mission to "spearhead research in international health" and make a "global contribution through health promotion by applying the results of research"

Project Staff

Leader and Professor	Kouichi Morita
Professor	Yasuhiko Kamiya
Associate Professor	Tatsuhiko Tsukakoshi
Technologist	Kenzo Sasagawa
Administrative Staff	Yumiko Nakamura



FIFTH PACIFIC IMMUNIZATION PROGRAMME STRENGTHENING WORKSHOP 11-15 May 2009 Nagasaki, Japan

Tropical Medicine Museum

Museum of Tropical Medicine was preceded by the Tropical Medicine Reference Centre, which was established in 1974 and was reorganized in 1997 as Tropical Medicine Reference and Information Center. In 2001, it was renamed as Research Center Tropical Infectious Diseases (RECTID) and in 2008 it was established as an auxiliary institution. The institution performs the following 3 functions.

The institute primarily functions as a museum and resource center for tropical disease. Currently, on the 1st floor of the Institute of Tropical Medicine Nagasaki University, there is a general section providing information on tropical diseases, parasites/bacteria/viruses/poisonous insects and specimen of dangerous animals, valuable books, and displays images of the data. Moreover, it has an audio-visual room accommodating a few numbers of people. Furthermore, a system is being developed for using this collection of resources to strengthen public science and risk communication with thousand points relating to the history and philosophy of tropical medicines and infection symptoms. In the near future we would like to expand the exhibition room to the museum of tropical medicine and can be used as an educational resource for society and educators and provide tropical disease related research and successful results for the public. In addition, we displayed “Africa's Nature, Development, and People,” in March 2009, as part of the Ueno Yama Decade of Information series of National Museum of Nature and Science, Tokyo.



It also functions as an information center for the dispatch, collection, organization, and analysis of information on tropical medicine. This has become an essential component of the daily research activities related to tropical medicine. Due to infrastructure rearrangement in 2007, network tools were updated with technological innovation and long lasting safety; thus responding to every need of the users. We also serviced various databases, using a research evaluation system and a database of the tropical medicine museum. Moreover, within this year we are trying to provide a similar environment to research universities overseas with VPN by including video conferencing system to promote international conferences and e-learning plans.

The third function is to perform a logistics support role for the Kenya base. The network is also used for communication with the base, equipment supply for experiments, and for the database of research results.

Head and Professor	Osamu Kaneko
Professor	Masahiro Horio
Assistant	Kazuo Araki
Assistant	Kiyomi Suda



Animal Research Center for Tropical Infections

The center makes it the principal aim to ensure the safety of animal experiments which are dealt with the pathogenic microorganisms and to build up the continuous production of experimental animals, microorganisms and parasites. The building consists of seven breeding rooms for experimental animals, three laboratories, one breeding room for snails and insects, and a P3-level biohazard laboratory.

The temperature of all the rooms is kept 25C all the year round. The air pressure is kept always negative to avoid outflow from inside. Since the building has the most thorough ventilation through HEPA filters, any microbes cannot leak out to outside of the building. The used cages are reused after autoclave-sterilization, and used water is drained off after chlorination. The laboratory animals bred in the center are mice, rats, hamsters, gerbils, rabbits, snails and mosquitoes. The number of users in 2008 was around 4,000.

The breeding and experiments are done according to Nagasaki University Animal Experiment Regulations.

Head and Professor	Osamu Kaneko
Research Associate	Tetsuo Yanagi
Assistant	Junko Kawashima



a laboratory in ARCTI

Central Laboratory

There are equipments shared in the institute. Those equipments are maintained and operated by the staffs listed below. There are three major laboratories to be set up, namely electron microscope lab, P3 and cell culture lab and molecular biology lab. Electron microscopies (TEM and SEM of jeol), a Ultramicrotome (Reichert), con-focal laser microscope system (LEICA DMIREZ), a flow cytometer (Becton), Bioimage analyzers (Hamamatsu Photonics, Bio rad GS-250 and Pharmacia Image master), DNA sequancers(Perkin-Elmer), a DNA/RNA extraction system (Qiagen), two P3 rooms, and 2 dimensional protein purification system (Beckman). Following are the major equipments.

Head and Professor	Kouichi Morita
Research Associate	Akitoyo Ichinose
Assistant	Kanae Tanaka



Lab for Genetic Analysis

Clinic at the University Hospital

The Department of Clinical Medicine is the only one clinical department at the Institute of Tropical Medicine. It has a clinic and a medical ward with about 17 beds on the 11th floor of the Nagasaki University Hospital. We specialized in the Infectious Diseases and Chest Medicine; diseases that we handle are systemic infectious diseases, including “tropical” diseases and HIV infection, and pneumonia including tuberculosis, and various neoplastic and inflammatory respiratory diseases. We actively receive consultations regarding diagnosis and management of infectious diseases from other departments. The outpatient clinic is open two days a week, which includes a travel clinic. We are also involved in various clinical trials such as cancer treatment, antibiotics, GM-CSF therapy for pulmonary alveolar proteinosis. We have also responsibilities for training medical students (lectures and bed-side teaching) and for postgraduate training programs for general internal physicians and infectious disease and chest medicine specialists. Since April 2006, we have been organizing a clinical case conference (in English) for tropical diseases as a part of Master of Tropical Medicine course. Furthermore, to enrich our knowledge with clinical tropical medicine, a staff doctor started to visit an infectious disease ward in Bac Mai Hospital, Vietnam, regularly and collect cases of tropical infectious diseases.

Clinic at the University Hospital

Professor	Koya Ariyoshi
Associate Professor	Konosuke Morimoto
Senior Assistant Professor	Yoshiko Tsuchihashi
Assistant Professor	Akitsugu Furumoto
Assistant Professor	Masayuki Ishida
Research Fellow	Mayumi Terada
Research Fellow	Takeshi Tanaka
Research Fellow	Kei Matsuki
Research Fellow	Takako Aoyama
Research Fellow	Kensuke Takahashi
Resident Physician	Mai Izumida
Resident Physician	Shungo Katoh
Resident Physician	Reiko Miyahara
Assistant Professor	Shoko Honda
Assistant	Ayako Kitamura



Department of Infectious Diseases

Administration

Toshihiro Furukawa, Director
Hiroaki Suetsugu, Expert Staff

General Affairs Unit

Makoto Matsuo, Head
Risa Yamashita, Sub-Head
Naomi Ota, Staff
Miyuki Yamashita, Assistant Staff
Eiko Sanefuji, Assistant Staff

Accounting and Facilities Management Unit

Takenobu Hayashida, Head
Tomohiro Ito, Sub-Head
Yoko Oya, Staff

Junko Suenaga, Assistant Staff
Yumiko Matsumoto, Assistant Staff
Asuka Matsuo, Assistant Staff
Risa Tatsuhara, Assistant Staff
Kozue Tsujita, Assistant Staff

Overseas Research Station Unit

Kenta Sasada, Head
Fumiko Hashiguchi, Sub-Head
Rie Ishikawa, Staff
Haruki Kazama, Staff
Yukie Saito, Staff
Idumi Hasegawa, Assistant Staff

Number of Staff (as of June, 2009)

Divisions	Professor	Associate Professor	Lecturer	Assistant Professor	Research Associate	Sub total	Others	Total
Enrollment	11 (5)	4 (1)	2	16 (16)	3	36 (22)	10 (9)	46 (31)

※ () number of fixed-term staff

Accounting

Revenue (in 2008)

Divisions	Amount (in thousands)
Tuition and Admission Fees	2,616
Others	15
Total	2,631

Expenditure (in 2008)

Divisions	Amount (in thousands)
Personnel expenses	504,882
the cost of equipment	415,336
Total	920,218

Grant-in-Aid for Scientific Research from the Ministry of Education, Culture, Sports, Science and Technology (in 2009)

Type of Research	Scientific Research on Priority Areas	Scientific Research (A)	Scientific Research (A)	Scientific Research (B)	Scientific Research (B)	Scientific Research (C)	Exploratory Research	Young Scientists (B)	Encouragement of Scientists	Total
Number of Grants	2	2	1	5	1	5	1	7	1	25
Amount (in thousands)	9,800	21,580	9,230	24,310	6,370	9,490	1,300	13,910	450	95,153

Grant-in-Aid for Scientific Research from the Ministry of Health, Labour and Welfare (in 2009)

Type of Research	Global Health Issue	Emerging and Reemerging Infectious Diseases	AIDS Control	Governmental Initiative for Drug Development	Special Research for Intractable Diseases	Total
Number of Grants	2	4	3	1	1	11
Amount (in thousands)	15,620	10,200	7,110	1,750	1,500	36,180

Grant-in-Aid for Forming Research Locations etc (Global COE)

Fiscal Year	2008	2009
Amount (in thousands)	342,940	318,929

External Funding (in 2008)

Divisions	Joint Research with Private Sectors	Commissioned Research	Commissioned Project	Endowments
Number of Sources	2	8	7	22
Amount (in thousands)	60,830	337,227	134,299	12,759

Agreement of Educational, Scientific and Scholarly Exchange

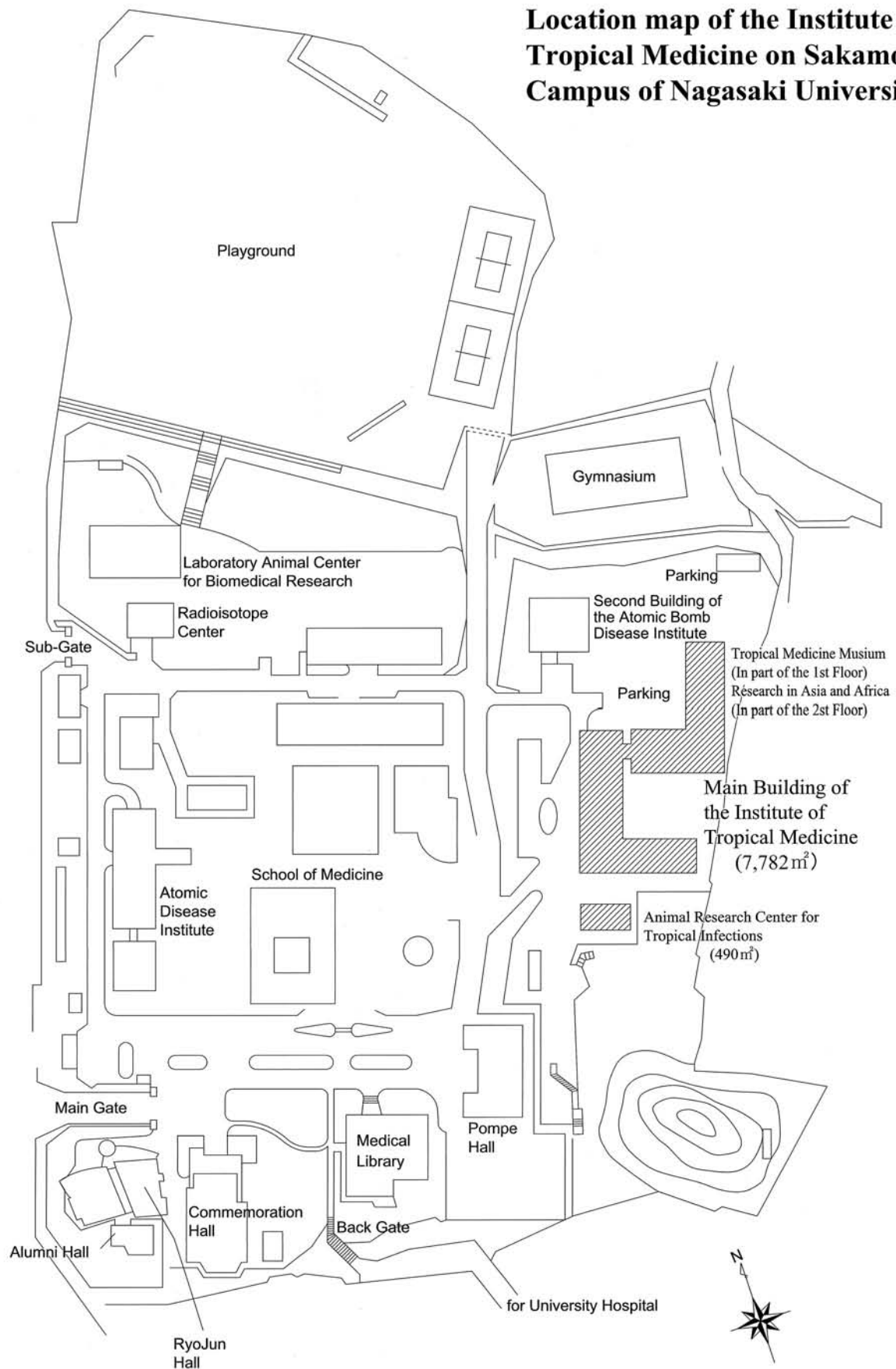
○Overseas

Name of organization of partner countries	Concluded date
Chiang Mai University (Thailand)	February, 1988
Mahidol University (Thailand)	November, 1999
Philippines University Diliman (Philippines)	April, 2001
Institute of Hygiene and Epidemiology (Vietnam)	June, 2001
Airlangga University (Indonesia)	January, 2004
St. Luke's Medical Center (Philippines)	February, 2004
SAN LAZARO HOSPITAL MEDICAL CENTER (Philippines)	August, 2004
KENYA MEDICAL RESEARCH INSTITUTE (KENYA)	November, 2004
THAMMASAT University (Thailand)	March, 2006

○Domestic

Name of organization of partner	Concluded date
The Research Institute of Tuberculosis Japan Anti-Tuberculosis Association	March, 2009

Location map of the Institute of Tropical Medicine on Sakamoto Campus of Nagasaki University



Telephone Number

Institute of Tropical Medicine, Nagasaki University

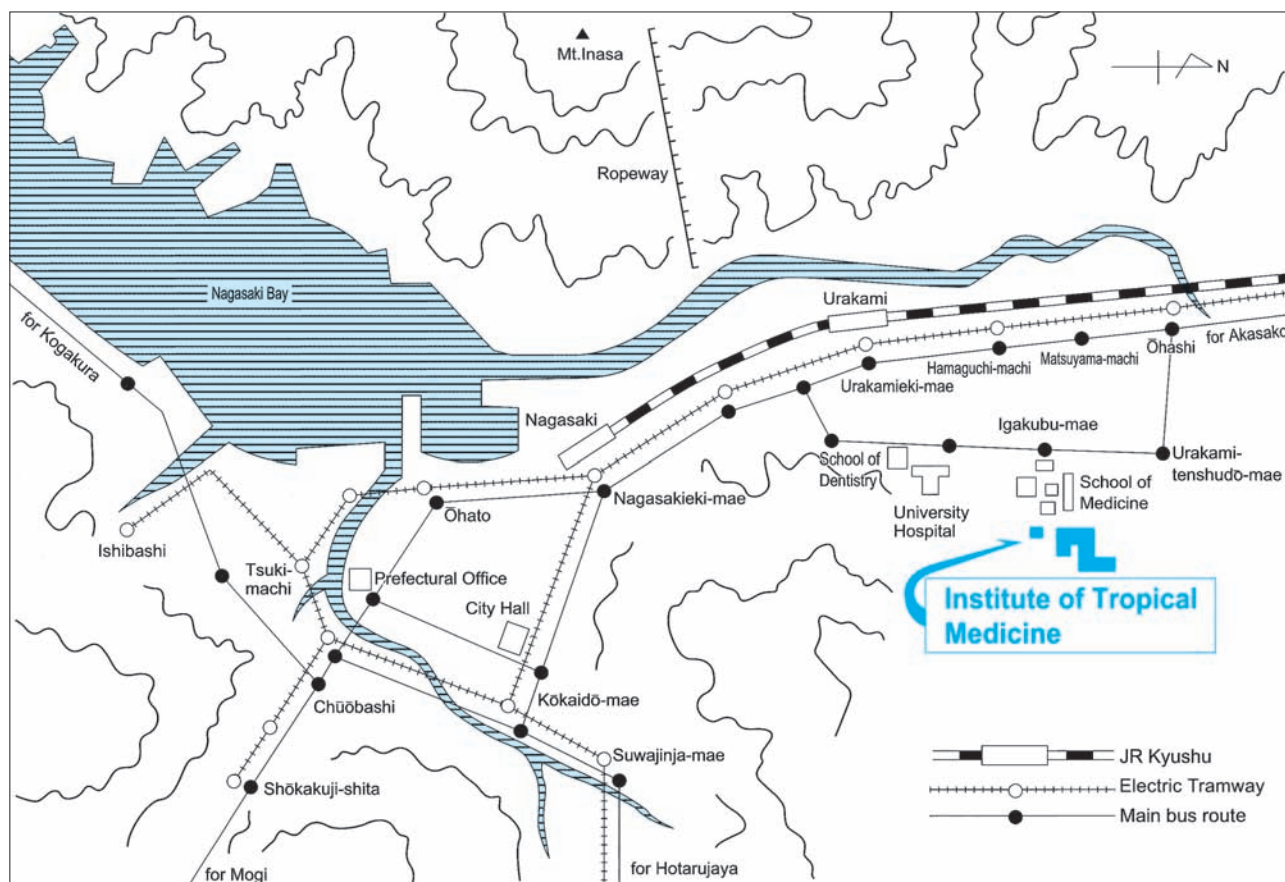
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Extensions

Dean	7 8 0 1	8 1 9 - 7 8 0 1
Head of Administrative Office	7 8 0 2	8 1 9 - 7 8 0 2
Expert Staff	7 8 1 3	8 1 9 - 7 8 1 3
Chief of General Affairs Unit	4 7 0 2	8 1 9 - 7 8 0 3
General Affairs Unit	7 8 0 3	
Chief of Accounting and Facilities Management Unit	4 7 0 6	8 1 9 - 7 8 0 7
Accounting and Facilities Management Unit	7 8 0 7	
Accounting and Facilities Management Unit	7 8 1 6	
Chief of Overseas Research Station Unit	4 7 0 9	8 1 9 - 7 8 0 6
Overseas Research Station Unit	7 8 0 6	
Facsimile	7 8 0 5	8 1 9 - 7 8 0 5
Meeting Room	4 7 1 1	
Department of Virology		
Professor	7 8 2 7	8 1 9 - 7 8 2 7
Associate Professor	7 8 2 8	8 1 9 - 7 8 2 8
Information	7 8 2 9	8 1 9 - 7 8 2 9
Facsimile	7 8 3 0	8 1 9 - 7 8 3 0
Department of Bacteriology		
Professor	7 8 3 1	8 1 9 - 7 8 3 1
Lab.2	7 8 3 2	8 1 9 - 7 8 3 2
Lab.1,Lab.3	7 8 3 3	8 1 9 - 7 8 3 3
Facsimile	7 8 7 7	8 1 9 - 7 8 7 7
Department of Protozoology		
Professor	7 8 3 5	8 1 9 - 7 8 3 5
Lab.2	7 8 3 6	8 1 9 - 7 8 3 6
Lab.1	7 8 3 7	8 1 9 - 7 8 3 7
Information	7 8 3 8	8 1 9 - 7 8 3 8
Laboratory	7 8 1 5	8 1 9 - 7 8 1 5
Department of Parasitology		
Professor	7 8 2 2	8 1 9 - 7 8 2 2
Staff room	7 8 2 3	8 1 9 - 7 8 2 3
Facsimile	7 8 2 4	8 1 9 - 7 8 2 4
Information	7 8 2 5	8 1 9 - 7 8 2 5
Department of Molecular Epidemiology		
Professor	7 8 6 0	8 1 9 - 7 8 6 0
Department of Clinical Medicine		
Professor	7 8 4 0	8 1 9 - 7 8 4 0
Associate Professor	7 8 7 3	8 1 9 - 7 8 7 3
Information	7 8 4 1	8 1 9 - 7 8 4 1
Information	7 8 4 2	8 1 9 - 7 8 4 2
Facsimile	7 8 4 3	8 1 9 - 7 8 4 3
Department of Immunogenetics		
Professor	7 8 1 8	8 1 9 - 7 8 1 8
Assistant Professor	7 8 1 9	8 1 9 - 7 8 1 9
Information	7 8 2 0	8 1 9 - 7 8 2 0
Facsimile	7 8 2 1	8 1 9 - 7 8 2 1
Department of Host-Defense Biochemistry		
Professor	7 8 4 8	8 1 9 - 7 8 4 8
Culture room	7 8 4 9	8 1 9 - 7 8 4 9
Lab.1	7 8 5 0	8 1 9 - 7 8 5 0
Information	7 8 5 1	8 1 9 - 7 8 5 1

Department of Pathology		
Assistant Professor	7 8 1 4	8 1 9 — 7 8 1 4
Department of Preventive Medicine and AIDS Research		
Laboratory	7 8 4 4	8 1 9 — 7 8 4 4
Information1	7 8 4 5	8 1 9 — 7 8 4 5
Information2	7 8 4 6	8 1 9 — 7 8 4 6
Department of Eco-epidemiology		
Professor	7 8 5 4	8 1 9 — 7 8 5 4
Information	7 8 6 8	8 1 9 — 7 8 6 8
Department of International Health		
Professor	7 8 6 9	8 1 9 — 7 8 6 9
Associate Professor	7 8 5 3	8 1 9 — 7 8 5 3
Lab.1	7 8 0 8	8 1 9 — 7 8 0 8
Information	7 8 6 9	8 1 9 — 7 8 6 9
Department of Global Health Development Policy Sciences		
Professor	7 8 6 4	8 1 9 — 7 8 6 4
Staff room	7 8 6 5	8 1 9 — 7 8 6 5
Information	7 8 6 6	8 1 9 — 7 8 6 6
Facsimile	7 8 6 7	8 1 9 — 7 8 6 7
Department of Vector Ecology and Environment		
Professor	7 8 1 0	8 1 9 — 7 8 1 0
Staff room	7 8 1 1	8 1 9 — 7 8 1 1
Information	7 8 0 9	8 1 9 — 7 8 0 9
Facsimile	7 8 1 2	8 1 9 — 7 8 1 2
Animal Research Center for Tropical Infections		
Office	7 8 5 6	8 1 9 — 7 8 5 6
Tropical Medicine Museum		
Professor	7 8 1 7	8 1 9 — 7 8 1 7
Information	7 8 6 8	8 1 9 — 7 8 6 8
Central Laboratory		
Electron Microscope Room	7 8 5 9	8 1 9 — 7 8 5 9
Information	7 8 5 7	8 1 9 — 7 8 5 7

Location map of the Institute of Tropical Medicine, Nagasaki University in Nagasaki City



How to get the Institute

○From JR Nagasaki Station

- ▶ Electric Tramway "Nagasaki Station" → (bound for Akasako) → "Hamaguchi-machi" → about 10-minute walk

Nagasaki Bus "Nagasaki Station" → (No.8 bound for Shimoohashi via School of Medicine) → "School of Medicine"

○From JR Urakami Station

- ▶ Electric Tramway "Urakami Station" → (bound for Akasako) → "Hamaguchi-machi" → about 10-minute walk

○From Nagasaki Airport

- ▶ Kenei Bus "Nagasaki Airport No.4 Bus Stop" → (bound for Nagasaki City via Showa-machi and Urakami) → "Urakami Station" → refer to "From JR Urakami Station" above

Location

1-12-4 Sakamoto Nagasaki 852-8523

URL <http://www.tm.nagasaki-u.ac.jp>

Published on August, 31 2009

Edited by Institute of Tropical Medicine, Nagasaki University

Printed by Dejima Printing Co., 1-54 Tokiwa-machi, Nagasaki 850-0843, Japan