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The Collaborative Study on Emerging and Re-emerging Infectious Diseases in Vietnam

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History of the joint collaborative efforts between NIHE and Nagasaki University

- Provided assistance and guidance to the development of Japanese encephalitis vaccines and technical transfer of safe product management
  - 1985 – 98
  - Prof Igarashi (1985 – 95); Prof Morita (1995 – 98)
  - Project carried out under the guidance of WHO
  - Production of 4 million doses of vaccines/year

- Exchanged an Agreement on Academic Cooperation with NIHE under the sponsorship of Japan Society for the Promotion of Science (JSPS)
  - 2000 – current
  - Identify potential factors that may contribute to emerging and re-emerging infections in Vietnam and to develop a preparedness plan on communicable diseases
  - Assist NIHE employees in diagnostic and research methods of infectious diseases

- 21 Century Center of Excellence Program (funded by MEXT)
  - 2003 – 2007
  - Establish a research center in Nagasaki University on emerging and re-emerging infections that aims to strategically control communicable diseases on a global scale

- New Project by the Center of Research Network for Infectious Diseases (MEXT)
  - 2005 - current

Project Objectives

・**To promote clinical** and **epidemiological** research through the establishment of a research center **in Vietnam** equipped with capacity to carry out activities at the front level (i.e. the development of a standard surveillance system, regional cohort study, analyses of pathogens and diseases transmissions).

・**To analyze, promote, archive and disseminate information** obtained from the clinical and epidemiological studies.

Structure of the Project

Japan

Nagasaki University

Clinical Trial Research

Genome Research

International Medical Center of Japan (IMCJ)

Viet

Mai Hospital

Major research areas:

1. Zoonoses
2. Vector-bo
3. Food-bor
4. Air borne
5. Respiratory (hospital based)
6. HIV/AIDS
7. TB

National Institute of Hygiene and Epidemiology (NIHE)

Opening Ceremony of the NIHE-NU Friendship Laboratory (NNFL), 17 March 2006

Dr Saito, President of Nagasaki University

Ambassador Hattori
Minister of Health, Vietnam

Current status of NNFL

1) NIHE-NU Friendship Laboratory（NNFL）

- Research equipment set up in a 60m^2 laboratory space
- Participation from NIHE's Project Manager
- Participation of 7 researchers from NIHE's 3 research departments1

2) Operational capacity of NNFL

- No. of researchers using NNFL facilities since the opening of the Laboratory（March 2006－May 2007）: 385
- No. of Visitors to NNFL（April 2006－ May 2007): 45

High-Tech Center Building in NIHE (Four P3 laboratories –JICA)

Allocation of new staffs (Nagasaki Univ

Areas	Researcher's Name	Post Title
Microbiology	Tetsu Yamashiro	Professor, MD. Ph.D
Public Health	Shun Yanai	Professor, MD, Ph.D
Virology	Futoshi Hasebe	Professor, VD, Ph.D.
Virology	Parquet Maria del Carmen	Associate Professor, Ph.D.
Molecular Immunogenetics	Mihoko Kikuchi	Lecturer, Ph.D.
Internal Medicine	Lay-Myint Yoshida	Jr Lecturer, MD. Ph.D.
Medical Entomology	Yukiko Higa	Jr Lecturer, Ph.D.
Virology	Toru Kubo	Jr Lecturer,MD. Ph.D.
Internal Medicine	Motoi Suzuki	Jr Lecturer, MD. Ph.D.
Virology	Gen-ichiro Uechi	Jr Lecturer, Ph.D.
Virology	Fuxun Yu	Jr Lecturer, M.D. Ph.D.
Medical Entomology	Kohei Takano	Post-doctoral Fellow, Ph.D.
Molecular Microbio and Immunology	Naoki Takizawa	Post-doctoral Fellow, Pd.D.
Molecular Immunogenetics	Huang Ming Guo	Post-doctoral Fellow, Ph. D.

Strengthening Research Capacity in Vietnam

- Seminars
- Workshops
- Journal Review Seminars

Research area 1: Zoonosis

Team Leaders: Prof Kouichi Morita and Dr Mai Q Le.

Areas of work

Development of treatment methods, analyses of disease trends between humans and animals, investigating viral mutations, pathogenecity, and archiving antibodies for possible human use on the following viruses: avian influenza, hanta virus, rabies virus, herpes B virus, SARS and Nipah virus

Research outcomes

- †Isolated new viruses from humans which causes encephalitis (e.g. Nam Dinh)
- †Developed diagnostics on Nipah virus
- †First identification of the hanta virus in northern Vietnam
- †Identified drug-resistant avian flu virus
- †Developing anti-rabies virus, anti-dengue fever virus, anti-JE virus, human monoclonal antibodies, and human monoclonal antibodies to neutralize the H5N1 virus

Surveillance of avian influenza (H5N1) viruses in poultry farms and their surrounding areas

- Objective: isolation of low virulent AI strains which cause asymptomatic infection among poultries and wild birds
- 3 provinces in northern Vietnam: Vinh Phuc, Nam Dinh, Hanoi areas
- 2,400 poultries and 300 wild birds were collected
  - Poultries: 20 birds x 40 farms x 3 provinces
  - Wild birds: 100 birds x 3 provinces
- Throat and cloacae swabs

Samples will be analyzed soon

(PI: Prof Ono, Tottori University)

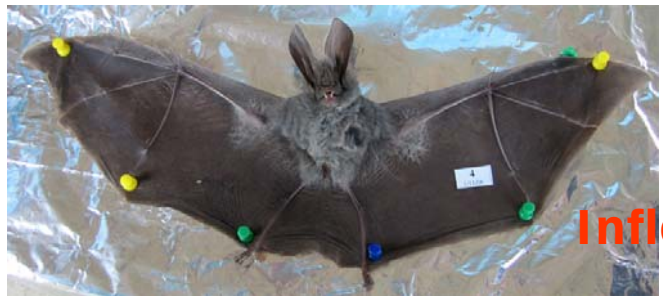
Virus survey in wild Bats

Cave complex Hue, Hoi An Ancient Town, Ha Long Bay, My Son Holy Land and Phong Nha

Microbats in Vietnam

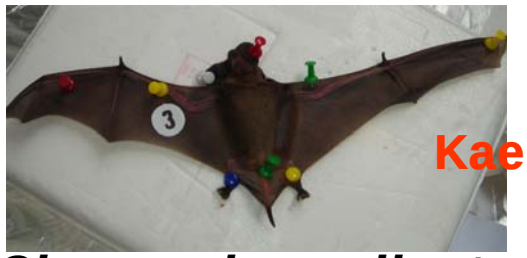
Nipah

Scotophilus Kuhli



Inflenza A

Megaderma spasma



Kaeng Khoi

Chaerephon plicata

Flaviviruses

Hipposideros cineraceus

Hysugo cadonae

Flaviviruses

Rhinophus spp

Bat specimens (Microbats)

Bat species	Serum	Body	Place	Date
Assliscus stoliczkanus	3	7	Hoa Binh	04/01/'07
Charephon plicata	49	17	Bac Giang	11/10/'06
Hipposideros armiger	3	3	Quang Binh	28/05/'07
Hipposideros cineraceus	4	3	Hoa Binh	04/01/'07
Hipposideros larvatus	4	3	Quang Binh	28/05/'07
Hysugo cadonae	26	1	Hoa Binh	--/11/'06
Megaderma spasma	2	0	„	--/11/'06
„	1	0	Quang Binh	28/05/'07
Miniopterus magnater	1	2	Hoa Binh	04/01/'07
Myotis siligorensis	2	2	„	„
Rinolophus thomasi	0	1	Quang Binh	28/05/'07
Scotophilus kuhi	3	1	Hoa Binh	--/11/'06
„	34	34	Quang Binh	28/05/'07
Taphozous melanopogon	1	1	„	„
Unkown species	44	3	Hoa Binh	--/11/'06
Total	176	78		

Research area 2: Vector borne

Team Leaders: Prof Takagi and Dr Hoa

Basic Entomology

-Updating mosquito checklist using molecular methods
-Ecological and spatial distribution mapping of dengue vectors throughout Vietnam
-Surveillance of dengue vector incidence and detection of key containers in urban areas in Nha Trang

-Evaluating the effects of global warming and urbanization on dengue vectors
-Diversity of breeding sites of Ae. aegypti in urban areas

Applied Entomology

-Methofluthrin application trial for a new comprehensive dengue vector control method
-Investigation on insecticide resistance in dengue vectors in Vietnam
-Entomological and epidemiological surveys with use of methofluthrin impregnated device

-Measurement of efficiency of methofluthrin impregnated device up to eight weeks
-Methofluthrin effectiveness in housing structures

Viral Entomology

-Creating a distribution map for mosquitoes infected with Flavivirus in Vietnam

-Isolating Nam Dinh Virus from mosquitoes

Research area 3: Food borne

Team Leaders: Prof Osamu Nakagomi and Dr Binh Minh

Objectives: Identify pathogens and the frequency of diarrheal diseases in U5 children in Vietnam; also, analyse molecular characteristics of the pathogens

Survey areas:

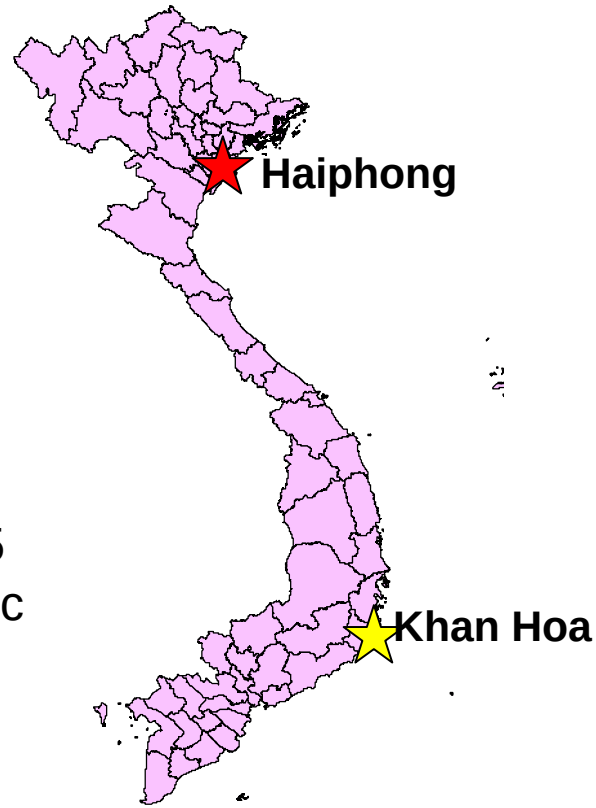
- ★ Haiphong: Previous survey area
- ★ Khan Hoa: Current survey area

Microorganisms under focus:

- Enteropathogenic virus
- Enteropathogenic bacteria
- Cryptosporidium

Research results:

- Diarrheal samples collected: 672
- Analyses conducted of the samples collected: 625
- Samples which tested positive for enteropathogenic microorganisms: 505（80.8%: 505/625）
- Samples which tested positive for rotavirus: 398



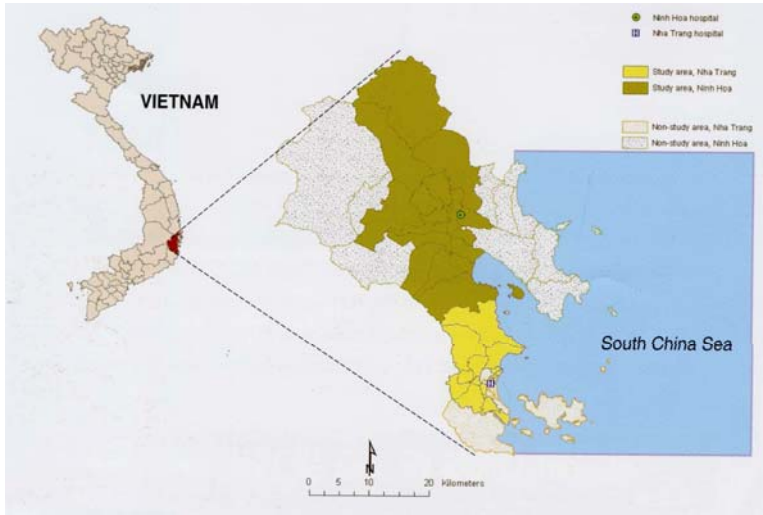
The G3P8 strain of the rotavirus is on the rise.

Research area 4: Airborne

Team Leaders: Prof Koya Ariyashi and Dr Duc Anh

- Khanh Hoa Health Project -

- Census covering 420,000 population with >80,000 households
- Health Care Utilization Study (n>2,000)
- Birth Cohort
- Acute Respiratory Infectious Diseases Surveillance is now being set up
- GPS/GIS analysis seeking etiologies for infectious diseases



Participating Institutions
Nagasaki University
NIHE
International Vaccine Institute (IVI)
Khanh Hoa Health Service Office
Niigata University

SARS related collaboration as an example

Hong Thi Cam Thai, et al. Development and Evaluation of a Novel Loop-Mediated Isothermal Amplification Method for Rapid Detection of Severe Acute Respiratory

Overall Outcomes form the Project

- Surveillance on Tropical and Emerging infectious diseases
- Risk assessment on emerging infections
- Translational research for the development tools against emerging infections

Coronavirus into Target Cells Expressing ACE2 with the Cytoplasmic Tail Deleted. J Virol. Vol.81: 8722-8729. 2007

Thank you