

Obihiro Research Center for International Collaboration

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INTRODUCTION

Welcome to Obihiro, one of the smallest universities in Japan. This symposium is a rather new type in Japan organized by Prof. Hirumi and other Professors in the Research Center. Therefore, I would like to take this opportunity to express our appreciation to you all for coming all the way to attend this symposium.

Dr. Kubo, President of the University mentioned in his Congratulatory Address the historical background of the Research Center, however, I would like to explain more in details about the international collaboration of our Research Center.

HISTORICAL BACKGROUND OF THE RESEARCH CENTER

As shown in the 1st Chart, in 1990 The Research Center for Protozoan Molecular Immunology was funded by the Government, as the only independent institute at 16 universities of veterinary science in Japan.

The purpose of the Center was basic research of zoonotic protozoan diseases, and to contribute to increasing livestock productivity not only for Japan, but also for other countries of the world. For this purpose, the Center will comprehensively conduct basic to applied researches for the elimination of protozoan diseases, and will try to contribute to offering international scientific cooperation, and developing young researchers as a core scientific research center in Japan.

Chart 1 *The Research Center for Protozoan Molecular Immunology Obihiro University, Obihiro*

1. There are 16 veterinary schools (10 National, 1 Prefectural, and 5 Private Universities) in Japan.
2. In 1990 the Research Center was founded by the Government as the one independent institute among 16 veterinary schools.
3. The purpose of the Center is to do on the basic and applied researches of mainly zoonotic protozoan diseases, and to contribute to increasing livestock productivity not only for Japan, but also for other countries in Asia.
4. The Center will try to contribute to offering international scientific cooperation, and developing young researchers as a core research center in Japan.

As the Director of the Research Center established by the Japanese Government in 1990 as shown in Chart 2, I would like to explain briefly the historical background of the Center. Since 1965 to the present at the Department of Veterinary Physiology, Obihiro

University, we started to study the immuno-pathophysiology, mainly based on the cell mediated immune response of the host infected with *Toxoplasma gondii*, in collaboration with Prof. Peikarski's group at the Institute of Medical Parasitology, University of Bonn, Germany. The main results obtained by us were the detection and isolation of biologically active immune modulators, namely Obioactin or *Toxoplasma* growth inhibitory factor

Chart 2 Summary of the Research Center (as an international collaboration)

Main activities	Collaborate with
1965 Lymphocyte-macrophage mediators Toxoplasmosis and Piroplasmosis Dept. of Vet. Physiology, Obihiro Univ.	Inst. f. Med. Parasitology Bonn Univ., Germany Mahidol Univ., Thailand
1970 Toxo-GIF (LKs) TLA	Dept. Parasitology, Univ. of Duesseldorf, Germany
1975 Japan-Germany Coop-Symposium every 2 years	Hannover Vet. Sch., Germany
1980 Obioactin (Immune Modulator)	Med. Parasitology, Chile Univ.
1983 Long term cultivation for <i>T. gondii</i>	De La Salle Univ., Philippines
1984 Newly Lab. of Protozoan Diseases, Dept. of Vet. Physiology, Obihiro Univ.	Free Univ., Berlin Vet. Sch., Germany La Plata Univ., Vet. Sch., Argentina (JICA Project, 1989-1996)
1986 Synthesized Obiopeptides (Immune Modulators) Purification and Isolation of TLA-144	Tokai Univ., Med. Parasitol., Japan
1990 Newly Research Center for Protozoan Molecular Immunology, Obihiro	Kitasato Univ., Vet. Parasitol., Japan
1995 Advanced study course on Protozoan Diseases for 10 foreign scientists Long term in vitro culture for <i>Babesia</i> , <i>Trypanosoma</i> , <i>Neospora</i>	Munich Univ., Vet. Sch., Germany US Dept. of Agriculture, USA Mongolia Agricul. Univ., Vet. Sch., Mongolia (JICA Project, 1996- 2001)
1997 Protozoan Ag transgenic and/or knock out animal experiments	Univ. Technol. Sydney, Australia
1998 Obihiro International Symposium 1998 Trypanosomosis 1999 Toxoplasmosis and other coccidiosis 2000 Babesiosis	Ondersteport Vet. Inst., South Africa

(Toxo-GIF) which is a new lymphokine, and *Toxoplasma* lysate antigens (TLA) as a lymphokine-activated killer cell inducer. The results of the lymphocyte and macrophage function, and their mediators in the host infected with *Toxoplasma* were reported at the

International Journals and Congresses of Parasitology, Protozoology, Tropical Medicine, and Immunology since 1974 in Munich, Germany. Since 1978, collaborators from developed and developing countries expressed their interests in the establishment of an international cooperative research center at Obihiro University. In 1984, the Laboratory of Protozoan Diseases was recognized by the government as a research unit in the Department of Veterinary Physiology, Obihiro University. With many collaborators not only from other Japanese universities but also from developed and developing countries, we expanded to study the experimental host immuno-pathophysiology of toxoplasmosis, piroplasmiasis and trypanosomiasis. In the study on mediators or newly lymphokines, we succeeded to synthesize Obiopeptides from biological active substance, Obioactin, and TLA144 as an immunomodulator or an active inducer of lymphokine-activated killer cells. In the series of Toxoplasma studies, the role of heat shock protein was found and studied by Prof. Nagasawa's group.

In 1990, the Research Center was founded by the Government as the only one of its kind at 16 veterinary schools in Japan. The purpose of the Research Center was basic research on zoonotic protozoan diseases, using molecular immunological methods, as well as offering scientific cooperation to other countries. The Center has its own quarterly journal publication, the Journal of Protozoology Research. Its publication covers a wide range of research activities and international scientific cooperation in the fields of protozoology, not only in Japan but also developed and developing countries.

For the period 1995 to 2005, the Research Center initiated an Advanced Study Course of Protozoan Diseases, which is offered to 10 university scientists from each of 10 developing countries for one year. In this historical background of the Research Center, we set up a new international symposium on trypanosomiasis in 1998, toxoplasmosis in 1999, and babesiosis in 2000. The main purpose of the Obihiro International Symposium is to have high-level scientific discussion, as well as to promote understanding and friendship among the attendants. These international cooperation is needed to establish a department of highly reeducational administration for protozoan diseases in the Center.

RESEARCH ORGANIZATION AND ACTIVITIES OF THE CENTER

As shown in Chart 3, there are 4 research units or laboratories, and now more than 30 researchers, including post-graduates and foreign senior scientists in the Center. That is, 1) Molecular Immunology, 2) Cell Pathophysiology, 3) Disease Control and Genetics, and 4) Molecular Arthropodology. At present, the main focus of the research as mentioned above is comparative zoonotic animal protozoan diseases at the cellular, molecular and genetic levels in scientific cooperation with each of the 4 research units in the Center, and with developed countries. As our emergent future plan in the Applied Research Department, we are asking the Government to have another research units, such as 5) High Technological Diagnosis, 6) Physiotherapy for Preventive Medicine, which are the most important theme in the world.

Prof. Mikami, Director of the Research Center since last April, 1998, is a very active specialist for virus vaccination by genetic engineering, and Prof. Fujisaki is also modern insect-technologist which is a most important subject in Japan. Prof. Toyoda and his staff are conducting development embryo-engineering research on transgenic and/or targeting knockout animals, and consequently, they succeeded recently to produce Toxoplasma specific major surface antigen P30 transgenic mice which is the first report in the world. Prof. Hirumi, of course you certainly know his name well, and the chairman of this

Chart 3 *Main Staff and Research Organization(Director: Prof. MIKAMI, T)*

1. Department of Basic Research Fields
 - A) Research Unit (Lab.) Molecular Immunology (since 1990)
Prof. Mikami, T., Assoc. Prof. Igarashi, I.
 - B) Research Unit (Lab.) Cell Pathophysiology (since 1992)
Prof. Takahashi, M., Prof. Hirumi, H.
 - C) Research Unit (Lab.) Disease Control and Genetics (since 1995)
Prof. Nagasawa, H., Assoc. Prof. Horiuchi, M., Dr. Inoue, N. (Instructor)
2. Department of Applied Research Fields
 - A) Research Unit (Lab.) Molecular Arthropodology (since 1997)
Prof. Fujisaki, K., Assoc. Prof. Sato, E., Dr. Xuan, X. (Instructor)
 - B) Research Unit (Lab.) High Techno-diagnosis (future plan)
 - C) Research Unit (Lab.) Physiotherapy for Preventive Medicine (future plan)
3. Department of Specialization Reeducation for Protozoan Diseases (future plan)
4. Other Research Staff
 - A) Scientific Advisors: Profs. em. Suzuki, N., Toyoda, Y.
 - B) Post Doctral Fellows: Drs. Choi, Y., Tanaka, T., Hirumi, K.
 - C) Academic Researchers: Drs. Fujii, Y., Maki, Y., Mishima, M.
 - D) Co-researchers: Profs. Saito, A., Shinagawa, M., Nishimura, M., Omata, Y., Shimazaki, K., Ono, K., Otsuka, H.
 - E) Foreign Collaborators: Profs. Hyedorn, O., Heidrich, H., Seitz, H., Leidl, W., Venturini, L., Claveria, O., Brockelman, C.
5. Annex
 - A) Science International Cooperation for 10 Foreign Senior Scientists (Special training course in advanced study on protozoan diseases, JICA-Monbusho project, 1995-2004)
 - B) Advanced Study Course for 10 Veterinary Specialists (future plan)
6. Special Institutions
 - A) Cell Bank for protozoan strains and cell lines (since 1992)
 - B) Safety Rooms (Levels P1-P3) for Zoonotic Protozoan Infection (since 1992)
 - C) Experimental Institution for Embryo Manipulation (since 1997)
 - D) Experimental Institution for Gene Technology (since 1997)
7. External Evaluating Committee for Research Activity
 - Aikawa, M., MD., Ph.D. (Prof., Case Western Reserve Univ., USA)
 - Osaki, H., MD., Ph.D. (Ex-Vice President, Kochi Med. College, Japan)
 - Kida, H., Ph.D. (Ex-Vice Minister, Ministry of Monbusho, Japan)
 - Kinjo, T., DVM, Ph.D. (President, Gifu University, Japan)
 - Kurami, E., Ph.D. (Director-General, Inst. Bioscience, Japan Energy Co., Japan)
 - Takahashi, E., DVM, Ph.D. (Prof., Tokyo University, Japan)
 - Johnson, A., Ph.D. (Prof., University of Technology Sydney, Australia)
 - Mehlhorn, H., Ph.D. (Prof. and Dean, Fac. Biology, Univ. Duesseldorf, Germany)

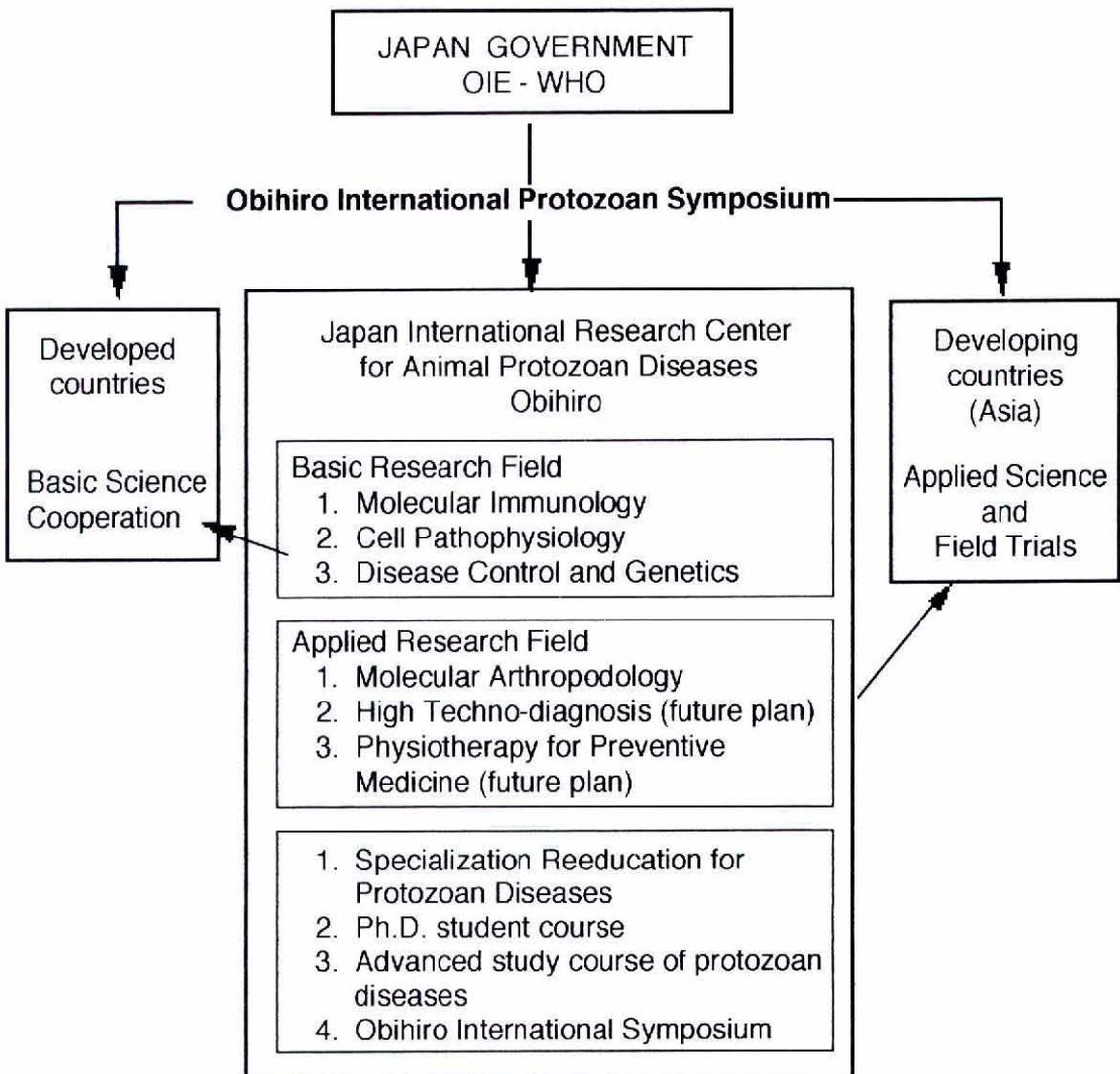
symposium, was the first in the world to succeed in reproducing a life cycle of *Trypanosoma* species by using an in vitro cultivation system. Prof. Hirumi and Mrs. Hirumi gave us all of

their excellent techniques and scientific knowledge for animal trypanosomosis as one of the important research subjects in the Center. Although we do not have any *Trypanosoma* infected animals in Japan, we believe that it is necessary to study together with you basic research field, using our techniques for a high diagnosis and chemotherapy for application in the clinical field in Asia as an international collaboration.

CONCLUSION

As I presented now about the situation of the Obihiro Research Center, finally our major goal is to contribute to increasing livestock productivity not only for Japan but also for developing countries in Asia. The basic studies in the Center are based on the cellular,

Chart 4 *Role as the Obihiro Research Center in International Collaboration*



molecular and genetic levels in scientific cooperation with developed countries as mentioned

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above. Results obtained on the basic studies are related to high technological diagnosis by in vitro culture and prophylaxis of diseases, such as toxoplasmosis, piroplasmosis and trypanosomosis in the applied research field. The Research Center itself is still developing a high international reputation in the world, therefore, it would be very valuable if this Obihiro International Symposium organized by us can be expanded and developed as an international scientific cooperation of a high standard with academic researchers participating from developed countries as well as developing countries. As we are now here in the first Obihiro International Symposium, I am personally expecting very significant results of the comprehensive research discussion conducted by all participants.