There are a wide variety of exchange programs for young people at different levels.
TMDU students and young researchers improve their skills by participating in training programs abroad.

Reports of TMDU Students in the World

Report 01

Joining research projects, learning Spanish and Chilean culture

F. Ihara, A. Sawayanagi, Y. Shigemasa
4th year students, Faculty of Medicine
Project Semester in Chile

We visited the Hospital Eduardo Pereira, one of the satellite hospitals for the pilot study of colorectal cancer screening program, with CLC doctors and Prof. Eishi and Prof. Yoshida of TMDU.

Written by Fumitaka Ihara

I belonged to the lab of immunology of the University of Chile. In this hospital, immunotherapy against melanoma is used to improve the prognosis of Stage Ⅲ/Ⅳ patients. My theme was "The Gap Junction contributes to the NK cells' cytotoxicity against melanoma cells". I did experiments with a Chilean teammate. If a better protocol or material could be found in a published paper, we had to discuss it with our professor or advisor, and sometimes we could chose it as a new way. Making experiments was so exciting that I had no trouble exchanging my opinions in English, and could enjoy searching for new methods from the published research.

Every member in this laboratory was very kind to me, and I miss them now. I could feel the Chilean atmosphere around the university. They introduced many typical Chilean places and foods like "completos" because there were many food stands around the facility where we worked. Additionally, on December 22, a Christmas party was held in the faculty yard. We exchanged presents, danced to Latin music, and ate barbecue. I will never forget this precious time or the friends I made in Chile, and greatly appreciate the opportunity I was given.

One of my friends took us to the San Cristobal Hill. After an hour-long climb to the top, we could see the beautiful face of Santiago.

Written by Ayana Sawayanagi

In Chile, people speak almost only in Spanish, so as for daily life, we should communicate in Spanish. But some people can speak English well, and Chilean people are very kind, so when we had any trouble, they were very willing to help us. Regarding safety, I think Chile is a very safe country. Of course we should take care when we ride on the crowded train or when we walk on a street alone at night, but it is the same in Japan. If you act with the same care that you exercise in Japan, you should avoid any serious trouble.

Chilean food is very delicious, and Chile is justly famous for seafood like salmon. To be sure, the meat in Chile is very good too. As for sweets, Chilean people like "manjar". It is kind of caramel, but it's very soft. Also, many countries in South America have common dishes, even though the names are different. Chile is also famous for wine and "pisco". Chilean wine has a very good taste, and also the prices are cheap. Pisco is liquor made from grapes, but it's actually distilled liquor. A popular cocktail in Chile is "pisco sour", and it is very good.

The food in the left is "empanadas", and on the right is "pastel de choclo". Both of these are very typical Chilean dishes.

Written by Yukiko Shigemasa

At Clinica Las Condes (CLC), I participated in a study that was undertaken at the Laboratory of Oncology and Molecular Genetics, which is a unit of the Coloproctology Lab. The study was entitled, "Study of the gene in Chilean families with polyposis syndromes", and the SMAD4 gene was one of the candidates being tested. During my project semester, my research topic was to find out if there were any relationships between developments of polyposis syndromes and mutations of the SMAD4 gene.

There were about 10 other people working at the laboratory. Two female researchers were my instructors. As I had never practiced the experimental methods which were needed for my study, they taught me about them with great patience. I had no troubles with communication because many researchers were fluent speakers of English.

There were some exciting events at my laboratory. When a member had a birthday, we always celebrated it with a birthday cake, and we also had a Christmas party and a Chilean-style barbecue in a yard. Other laboratory members were friendly and I could relax and enjoy the time we spent there.

My research life at CLC left nothing to be desired as we could work on our study with plentiful materials, with the latest machines, and of course with the wonderful people of Chile.

Members of the Laboratory of Oncology and Molecular Genetics; I'm in the middle of the front row. The lab members are all kind and cheerful, so the lab has a really homey atmosphere.

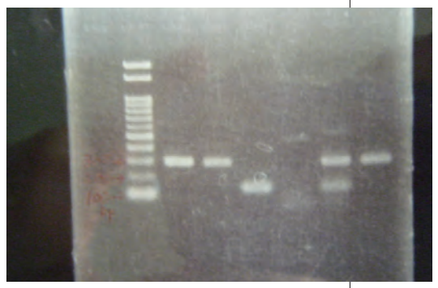
Report 02

No matter how hard the situation is in Ghana, our goal is the same

K. Wako, H. Matsuo, S. Shinchu
4th year students, Faculty of Medicine
Project Semester in Ghana

Written by Kentaro Wako

I am studying two subjects about malaria, in which pathogens are transmitted by mosquitoes. I'm approaching the disease from both the pathogen side and the mosquito side. In one subject, I've been investigating whether mosquitoes in Ghana have a resistance against major insecticides. What I want to see is a mutation of a gene, which gives mosquitoes such resistance. So, recently I've been doing PCR, in which I amplify specific genes and detect them. In these PCR experiments, I can judge the presence of resistance from the location of gene bands. First, I analyzed mosquitoes that were raised at the Noguchi Institute. I found that they have no resistance. Next, I'll analyze field-captured samples. I wonder if pesticide resistance is spreading in mosquitoes in Ghana. I'm interested in the results.



Pictures of mosquito genes amplified by PCR. One band locates between 100bp and 200bp, and the other locates in about 300bp. This reading means that this mosquito has no resistance.

We are enjoying passion fruits with our driver at the vegetable shop on the street.

What we do in Ghana is not only research. Of course we enjoy the local food, sightseeing, and exchanges with locals and visitors. We went to a park with members of the Parasitology Lab-

oratory, had barbecue, played football, and danced. Ghanaian people are very cheerful, and they speak to us with enthusiasm and good cheer. Thanks to them, my listening comprehension seems to be improving.

Written by Haruka Matsuo

We came to Ghana two months ago and are studying trypanosome. Trypanosome is a protozoan that is carried by tsetse flies. I am taking a part of the project that clarifies which genes are involved in the movement of the protozoan. This is the first time for me to do research, although the staff members at TMDU taught me basic knowledge of biology and the way to use some experimental materials. That practice time in TMDU was necessary and much appreciated not only because there are few doctors who can teach me in Ghana, but also because I could realize that studying in Japan is very comfortable.

Studying here seems hard. For example, power failures are all too common. When the power goes out, all the machines, including lights, PCR machines, electrophoresis machines, and refrigerators stop. The water supply also sometimes stops. We have to stop our experiments until the power comes back on. Also, icemakers don't work well, so research assistants use small refrigerators instead of ice sheets.

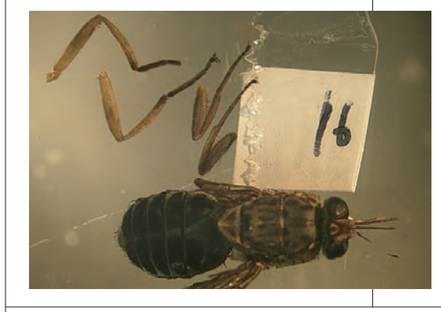
Pupae of "Anopheles gambiae". The left one is male and the right one is female. We can easily see the difference by looking at the tail.

This is our container insectary. We work here every morning and evening. It is very hot and humid in the container.

Though there are difficulties, staff members and research assistants come up with solutions and we can get wild samples that are not available at all in Japan. The staff members have promised us the chance to collect wild tsetse flies. I'm looking forward to it.

Written by Sayaka Shinchu

My research topic is malaria, especially in the mosquito stage. I am trying to make a transgenic mosquito and inhibit the transmission of malaria. I practiced injecting plasmid into the mosquito eggs and learned how to establish the transgenic strain in Japan. I enjoyed it and was really looking forward to studying in Ghana.



This is a tsetse fly. I confirm their species and sex before doing DNA extraction.

But when I went the insectary at NMIMR, there were no mosquitoes except only one tray of larvae, which had a bad smell. I was very surprised at this situation, but it is no use complaining about that. Joe, who is a responsible for our insectary, and I work together every day. It is now the dry season, which is called "harmattan", so we have many difficulties in maintaining the room temperature and humidity. It seems that every time we go to the insectary, some serious problem happens. Many larvae died because of the cool water temperature, and many adults died because of the high temperature. What is more, communication is not easy for us. Joe repeats the same things many times when I don't understand well.

Indeed it is a difficult situation, but I'm really enjoying my work with Joe. The reason is that, no matter how hard the situation is, I feel our goal is the same.

Report 03

Study, Research, Sightseeing ! Our daily activities in Thailand

Yoko Taketani, Yuko Adachi
4th year students, Faculty of Medicine
Project Semester in Thailand

At an operating room with my teacher.

IN THE SECOND half of our 4th year, we have the opportunity to focus on research. There are many kinds of options. Fortunately, we had the chance to go to Chulalongkorn University (CU), Thailand. It was the first time for both of us to go abroad. We could watch, hear, feel, taste, and think many things that we had never imagined before at all.

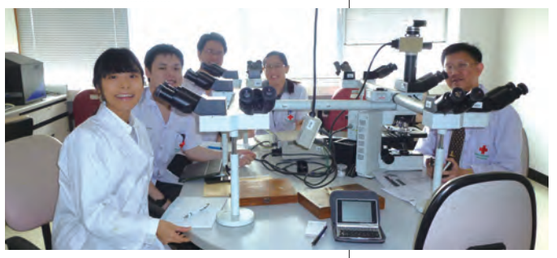
There are many unique characteristics of Thailand, and we think one of those is that many food wagons are along the street everyday. We can get quite a variety of foods at these wagons at small cost. Our friends took us there, and the various dishes on offer and how to order it in Thai. Thai people are very friendly and ask us to lunch and dinner for many times. Thanks to them, we can also enjoy our private activity very much. During the short term, we went to many shopping malls, weekend markets, the aquarium, small trips, and so on.

At CU, we belong to Department of Pathology, and Department of Surgery. Sometimes, we visit each other's department and share our research. Here, medical students start clinical practice from 4th year. With 4th year students and residents, we visited the operating room, went on doctor's rounds, and saw outpatients. In Thailand, upperclassmen guide lowerclassmen very well and they also guided us very kindly. Thai hospital room can accommodate very many patients, and the biggest room can accommodate more than ten. Some rooms don't have windows and are left out in the open, and I felt that Thai hygienic environment is inferior to Japanese. Thai doctors as well as Japanese seem to be very busy but they seem to have high motivation, so we want to follow their example, we think.

At the pathology laboratory, we learned basic skills for DNA extraction, PCR, and electrophoresis. We also joined meetings and lectures with other residents. We can check slide glasses together, and doctors gave us lecture in English, very kindly and politely.

We go to dinner very often with our teachers.

A pathology discussion with a teacher and residents.



Last October, we went back to Japan temporarily because of the severe flooding in Thailand. CU is in the center of Bangkok, and this area didn't have any direct flooding. However, because severely flooded areas like Ayutthaya and northern Bangkok were shown on the news every day in Japan, many acquaintances made contact with us. We were very thankful to them and at the same time we were at a loss what to do. At the beginning of October, we were caught in a heavy thunderstorm from night to next morning, but the weather turned very fine by the end of October.

However, as the news about flood became extreme in Bangkok, we saw many sandbags piled up at all parts of the city, and water for drinking or cooking was put into special corners in at supermarkets and convenience stores. We were afraid that the situation would be similar to the aftermath of the Great Eastern Japan Earthquake. Because we can't understand Thai news, the only information we could get at first was the Japanese news on the Internet, and we were distressed by the lack of information. After Japanese professors came to Thailand, we were able to get to know Japanese who work in Thailand and Thai people who can speak Japanese. All of these people supported us very kindly.

In January, the floodwaters receded, and we could go back to Thailand and start our research again. Still, as the term was shortened, we want to redouble our efforts to do research, make more friends, and enjoy life in Thailand.

An official meeting between Chulalongkorn University and TMDU.

Report 04

Study at the international laboratory of Imperial College London

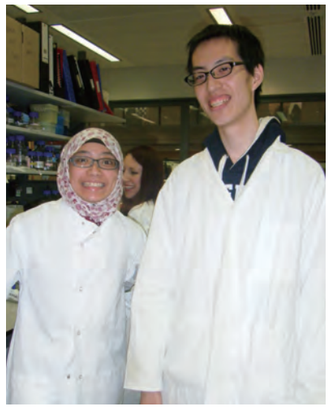
Nobuyuki Kondo
4th year student, Faculty of Medicine
Exchange program in UK

WE HAVE BEEN studying at Imperial College London as exchange students from last October. Staying and studying in the UK has been a very valuable and wonderful experience for me.

I chose invasion of skin cancer as my project. In metastasis of cancer, cancer cells destroy cell junctions so that they can move into other tissue or organs. My project focuses on the pathway of cell junction destruction. I am especially doing research on a new protein that was found by our laboratory so it interests me a lot. As I've never been in laboratory before, the members of my laboratory kindly taught me how to do experiments. To do lab work in English is not as hard as I thought it would be because the English used in laboratory is simple. Mainly I used molecular biological methods and I did lots of Western blots, which is used for probing the amount of proteins in cells, and learned that experiment itself is interesting but it takes a long time and demands much patience.

Now I'm struggling to write my report. British people like to draw a big picture and they are good at constructing articles. I've learned how to show figures persuasively and clearly. My supervisor gives me lots of productive advice, including correcting plenty of my mistakes. I greatly appreciate this precious chance to write an academic paper in English. My laboratory is quite international; we have researchers from England, Brazil, Brunei, Germany, India, Peru, Greece and Japan. The idea that people from different countries have a different accent and pronunciation when speaking English never really occurred to me before I came to the UK. I think one difficulty for Japanese in listening to English lays not only in native speed and connection between words but these accent differences. I want to accurately distinguish different accents someday. It was also a great experience to communicate with many people from many different backgrounds as well as to make friends.

As soon as I arrived in London, I noticed that such simple things as buying food at the supermarket, taking the underground and answering the phone were daunting. But as I got used to the living in London, everything in my life seems inspiring. I got interested especially in European history and culture. On December 26, Japanese people put away their Christmas decorations and start preparing for New Year such as "kadomatsu". But I found that even on January 3, there are Christmas decorations in London. So I did a search on Wikipedia and found that they celebrate Christmas until January 6, Epiphany. It's not because they are lazy.

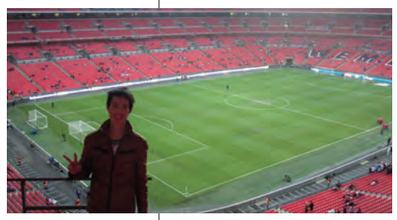


My friend from Brunei, she is a PhD student and taught me many experimental techniques.

The South Kensington Campus of Imperial College London, where we studied.

My experience has widened my view extraordinarily. It is an easy thing to say, but I have found that it's very important to stay in different country. British people work efficiently effectively. Thus, although we finished our work each day, I still had much spare time and enjoyed watching musicals or football matches. I was able to see the beautiful Edinburgh Castle, the mysterious Stonehenge monument, and the magnificent Big Ben clock tower. I also had time to consider how I could spend my time effectively. In addition, I was astonished that they told me "It's up to you" so many times. I now feel how self-management is important.

My farewell party at the lab. The members of my lab sometimes go to lunch together.



We went to Wembley Stadium to watch the England vs. Spain football match.

Right now I completely have no idea how this experience will impinge on my career in the future, including whether I will do clinical medicine or research. However, this experience will definitely increase my future possibilities and make me much more proactive. I would like to thank everyone who organizes and supports this program.

Report 05

Seeing the difference in how health insurance systems are structured and operated

Akane Wada, Mayuko Fujii
4th year students, Faculty of Dentistry
Dental Elective Program at King's College

WE HAD THE wonderful opportunity to spend two weeks at King's College London in 2011. During our stay, we learned a lot about dentistry and cultural differences, and are very grateful to our hosts at King's College. Thanks to their hospitality and kindness in every area, we were able to make the most of our chance. We will always treasure our experience thanks to the support of all people at King's College and the Faculty of Dentistry at TMDU.

While at King's College, we visited some clinical offices as part of a Dental Elective program. We thought that there were only a few differences in clinical practice between King's College and TMDU until we visited there, for both UK and Japan have mature social systems and dental studies. However, we found that there were actually a lot of differences.

At the restorative dentistry clinic, we observed general dentistry. Patients who had been introduced by their home dentists with letters of introduction came to King's College to get a second opinion. In general the dentists interviewed and examined patients, gave some advice and perhaps a second opinion, and sent letters back to the home dentists. In some cases, for reasons of research or to provide a simple case for students, the patients were asked to let King's College treat them. A dentist we observed for two hours that day examined 6 patients, and decided that only one patient would be accepted for continuous treatment. Some patients were eager to enter treatment at the hospital, but the dentist firmly explained only selected cases were treated there. In contrast, at the TMDU dental hospital all patients can receive treatment, without letters of introduction, regardless of their condition.

At the Paediatric Dentistry clinic, we observed dental surgeries for children. We were surprised at how many teeth were extracted. One dentist extracted about 6 to 15 baby teeth per patient, and she treated 9 patients from 13:30 to 15:00. The operating room had three doors. One was for staff, another was an entrance for patients, and the other was an exit for patients. Patients, under intravenous sedation, were brought into the theatre through the second door, given local anesthesia, had their teeth extracted, and left through the third door. The operations were performed speedily and efficiently. At first we thought that the reason for the number of extractions was a traffic accident or some other trauma, but it was in fact because of caries.

At the Gordon Museum at the King's College Guy's Campus; many precious specimens are stored here. This museum is historic as well as housing many important items.

With the dental nurses at the Orthodontics Clinic. They are very cheerful.

At the orthodontics clinic, we met dental nurses. Dental nurses are different from both dental hygienists and dental assistants in Japan. They assist dentists by leading patients to the dental chairs, chat with them until the dentist arrives, assist with the dentistry operation, and clean the dental units after use. These nurses were very cheerful and created a lively atmosphere. Some Japanese believe that clinics should be serious and solemn, but others feel nervous or fearful in such an atmosphere. Dental nurses help to relieve the tension, and are especially good for the latter people, we believe.

By observing dentistry as practiced overseas we were able to have an experience completely different to that which we would get by simply traveling abroad as tourists. In addition to our experiences at the clinic, we were able to open our eyes to many things, for instance, feeling the consciousness British people have for mouth care from the daily commodities sold all over a town, and seeing the difference in how health insurance systems are structured and operated.

London is a world-class city such as Tokyo and people of many backgrounds

live there. We felt vividly how the diverse members of the population live together and how multiculturalism is present everywhere in London. Moreover, we saw people with various roles assume dental care in coordination from everyday dentistry to surgical treatment at KCL, and that made us consider how to provide a highly satisfying service to our patients more efficiently. Also, we felt that we needed to not only raise the level of medical treatment in Japan, but also to improve access to information and provide informed consent in both directions, by no means treating it as a one-sided proposition. We noticed the importance of cooperation in helping teamwork and a person develop. To take best advantage of our experience, we would like to improve our skill as much as possible and to do our best to improve the service we provide via dentistry, by keeping what we learned uppermost in our minds.

With a group of dental nurses. I was nervous because of my role in the hospital abroad, but felt at home with them.

KCL has five campuses, and we mainly visited Guy's Campus. This campus is situated next to London Bridge station and beside the Thames River. The riverside view was incredibly beautiful.

Report 06

The workers at Harvard are well-trained at giving a concise and logical presentation

Kazuaki Matsumoto
6th year student, Faculty of Medicine
Clinical Clerkship at Harvard Medical School

THANKS TO THE exchange program, I was able to complete a three-month clinical clerkship at Harvard Medical School hospitals. I rotated through three services, one month each, Hematology/Oncology at Massachusetts General Hospital (MGH), Neurology at MGH, and Newborn Medicine at Children's Hospital Boston (CHB). The consultation service of Hematology was the most demanding and enjoyable. It was also unique to the medical circles in America. This service is responsible for any benign hematologic issues consultations, such as hemolytic anemia, pancytopenia, Factor V Leiden. We received consultations from any services in MGH. My team consisted of an attending physician, a fellow and me.

Here is a report on a typical day's schedule: I arrive at the office at 6:30 and check the latest laboratory data of my patients, and then attend a morning conference at 7:00, in which we present case reports or discuss brand-new topics about the basic science of hematology and oncology. Next, I see my patients who were hospitalized in various wards, Neurology, General Surgery, General Medicine and Transplant Surgery. I listen to their complaints and note any changes, perform a quick physical examination and write a note in their chart. While writing a note, I would often receive a message on my pager from a fellow, saying something like "Hey, Kazu. New Patient: 27yM presented with pancytopenia in Neurology. Go and see him." I was never introduced to new patients before the fellow saw them. Then I go and see the patient, taking a complete history with physical findings. After examining the patient, I construct differentials, an examination schedule and treatment options while referencing UpToDate. I had to write up a consultation notes that were like the admission notes I wrote during my clerkship at TMDU. It was very demanding because, at TMDU, we students rarely see a new patient who has not yet been diagnosed or who needs to have their treatment options planned. At noon, I attend a luncheon seminar, as usual. The subject matter varied from case reports to lectures. The most impressive one was presented by the authors who wrote a case record for NEJM. So exciting!

After lunch, I show my case note to the fellow and present the patient. He gives me detailed feedback and presentation, then accompanies me as we visit the patients, new ones and previous ones. He repeats his history taking and physical exams, and gives more detailed feedback to me. Then an attending physician arrives and I present the patient to her. As you might expect, she provides even more detailed feedback. The two doctors make a treatment/examination plan, and then modify and sign off on my note, which was put on the medical chart for the primary team doctors to read.

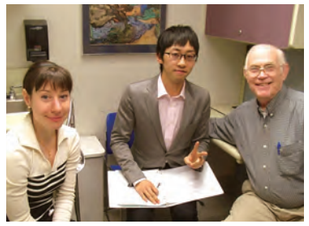
Through this program, I realized that the students and doctors working at Harvard are really well-trained at giving a concise and logical presentation because they have many opportunities to give presentations due to the education and medical practice system I mentioned above. They can absorb vast amount of knowledge by making use of these opportunities. In addition to this, there are many more co-medicals, including nurse practitioners, registered nurses, IV nurses, whose work is only to draw blood and start IVs, and clerks. This variety of roles contributes to a reduction of residents' duties and allows more time for them to study. Students at Harvard are given a great amount of responsibility for a patient care, which I felt also facilitates their study process and enthusiasm.

I cannot adequately express my appreciation for the staff at TMDU enough, even with millions of words of gratitude, and I hope that through my experiences I will be able to contribute to the education of students in the future.

With an attending physician and a fellow at NICU at CHB.

I am presenting my patient to the team during the morning round.

All the members of the exchange program, in front of Gordon Hall.



With a resident at MassGen and an Simulated Patient, at the orientation session.

Report 07

Study at Seinäjoki University of Applied Sciences in Finland

K. Sekimoto, M. Kimoto
3rd & 4th year students, Faculty of Medicine
Study program in Finland

AS A PART of a study abroad program and joint research, students of the School of Health Care Sciences have an opportunity to participate in a program held at Seinäjoki University of Applied Sciences (SeAMK), Finland. Over the past few years, many students have visited Seinäjoki and improved their skills. This year, we participated in this program from the end of August through mid-September, 2011.

Written by Kaori Sekimoto
3rd year student, Medical Technology

My goal for this program was to learn about Finland's medical system and to share cultural information by communicating with many people. During my three-week stay, I spent most of the time participating in meetings and studying at SeAMK laboratories and Seinäjoki Central Hospital. I had the opportunity to take part in discussions with many people from various fields, for example, nurses, preventive home visit researchers, economics teachers, engineers, and friends from many European countries. I was able to broaden my point of view on inter-cultural communication. It was a good chance to share ideas and to know about Japan. When I participated in Japan-Finland conference sponsored by his Excellency, Mr. Hiroshi Maruyama, Ambassador of Japan to Finland, I felt that cultural exchanges between two countries have been active recently and have good influence on each other. Since Finland has been successful in maintaining high standards in health care and education, we should absorb more strategies to build up better educational systems.

During my visit to Seinäjoki Central Hospital, I visited many laboratories and learned how specimens were ana-

Public Health Nurses of Kauhava, Manager of International Affairs SeAMK, a SeAMK professor, and TMDU students Mayumi Kimoto (left) and Kaori Sekimoto (right)

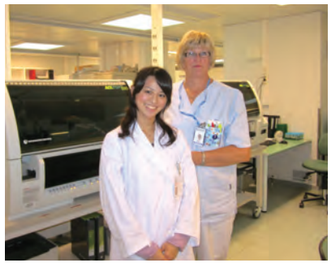
lyzed in hospitals in Finland. Since I have just started practical training in school, it was a very valuable experience for me to be able to accompany medical technologists and meet with patients. Learning new examination methods and practicing them, and helping to make specimens were challenging but rewarding tasks. Some of the tests required the utmost urgency, so I felt a sense of responsibility there.

From all that I saw, I found that Finland is a wonderful country. This program had a big influence on me, and I am very pleased that I realized the importance of being an active learner in order to improve myself.

Written by Mayumi Kimoto
4th year student, Nursing Science

I stayed in Finland from August 31 to September 5, 2011. I am interested in preventive home visits for elderly people and studied this topic for my graduation thesis. In Finland, preventive home visits for the elderly people is carried out extensively, so my purpose in visiting Finland was to research the state of preventive home visits for the elderly patients and compare it to the situation in Japan. I conducted interviews with public health nurses, who are responsible for preventive home visits in Kauhava. They gave me their frank opinions, ideas and empirical data on the preventive home visit system for the elderly people. The data was very effective in helping me understand the state of the system of preventive home visits in Japan.


Meeting with Ms. Helli Kitinoja, SeAMK (left)


At Seinäjoki Central Hospital

I stayed with a local family and found how the lifestyle in Finland is differs greatly from that in Japan. For example, night comes so late in the summer that people in Finland enjoy the long daytime. I was surprised but I think it was nice custom. Moreover I visited several institutions, SeAMK, a nursery school, a home-visiting nurse station and so on. I learned a lot of things, including things outside my field of study. This experience expanded my knowledge and gave me diverse perspectives. Although my stay in Finland was too short, I could gain a lot of invaluable experiences.

Finally, we would like to express our whole-hearted gratitude to all the people who supported our visit and gave us such a precious opportunity.


The SeAMK cafeteria

Report 08

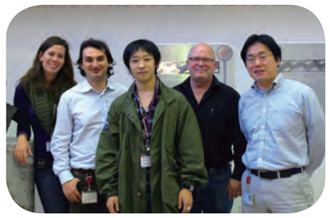
Participate in fetal cardiac bypass experiments at Stanford University

Kenta Furuhashi
4th year student, Faculty of Medicine
Project Semester in USA

AS A PART of my Project Semester activities, I had a chance to visit Stanford University, School of Medicine, Department of Cardiothoracic Surgery, Division of Pediatric Cardiac Surgery, from October 16 till December 5, 2011. In this article, I'd like to report my 1) background and motivation for visiting, 2) experiences and activities and 3) accomplishments obtained at Stanford University.

Background and motivation

As the place to do my Project Semester Research, I've chosen the Department of Artificial Organs, Institute of Biomaterials and Bioengineering, TMDU. At the time of my interview, Professor Setsuo Takatani, Chairman of the Department, told me that he'd been collaborating with Stanford University Department of Pediatric Cardiovascular Surgery by providing them with a *TinyPump*, a blood pump for pediatrics developed in his department, for fetal heart bypass study in pregnant sheep since December 2010.


My lab colleagues: Juliette Albersen (student), Dr. Giuseppe, myself, Dr. Riemer, Dr. Kagawa (from left to right)

TinyPump's most unique feature is its extremely small priming volume, namely 5mL. There are characteristic conditions of the fetus stage that favor the use of *TinyPump*. One is the difference in the type of hemoglobin between a fetus and its adult host, which makes blood transfusion difficult. The other is the extremely small circulation blood volume. If a pump with a larger priming volume is used, the prime solution will cause severe hemodilution.

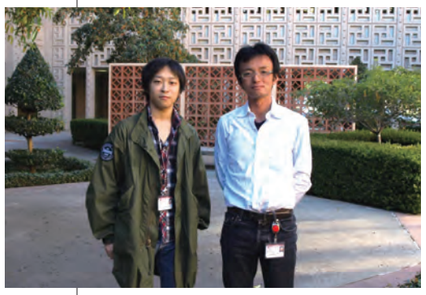
I wanted to learn more about fetal cardiac bypass study at Stanford University as well as at medical school in the US.

Experiences and activities

I was welcomed by the research team of Pediatric Cardiac Surgery, headed by Dr. R. Kirk Riemer. Fortunately there are two Japanese medical fellows, Dr. Hiroshi Kagawa from Jikei Medical College, the operating surgeon of fetal cardiac bypass experiments, and Dr. Yasuhiro Fujii, from Okayama University, the assistant surgeon who took care of me greatly.

I followed Dr. Fujii nearly everyday. On the days when we had no experiments, we usually studied in the library together. I read some books and papers about fetal cardiac bypass, such as "Hurst's The Heart" and "Langman's Medical Embryology." In addition, I did the "Kaplan Medical USMLE Step 1 Qbook" mainly to become familiar with English medical terms. On Monday and Wednesday mornings we usually had laboratory conferences. I occasionally attended the lectures given by faculty members Dr. Reddy, Dr. Hanley, and residents once a week.


I was given the chance to try suturing.


With Dr. Fujii at the garden in front of the library, where we usually studied.

Fetal cardiac bypass experiments were performed on Tuesday and Wednesday, every other week, at UC Davis, which is 160km away from Stanford. Because pregnant ewes are at risk for Q fever, a kind of zoonosis, these animals can't be handled at Stanford University. At UC Davis I helped prepare for the operation, filling syringes with blood, normosol or saline, and doing all other preparatory activities.

I was also given the chance to open the abdomen using an electric cautery and to suture incisions. Both were my first times and really rewarding. Of course, I also observed the operations. Everything I saw was new to me, including seeing the uterus filled with a fetus, the fetus connected to placenta via umbilical cord, and the fetus's small heart.

Accomplishments

Observing the fetal cardiac bypass experiments was a great experience. However I believe the best part of my visit was that I had a chance to see two Japanese young doctor's real life in the US Dr. Fujii told me about the current state of pediatric cardiac surgeons in Japan. I was shocked to learn that the training system for young surgeons in Japan is extremely poor. It is worse than I'd ever thought possible.

I realize that I'll have to choose my eventual department considering not only my interests but also the situation that we will be in 10 or 20 years from now. Going to the US might be one option. I'm not sure whether I will have any chances to go to the US in the future. But in any case, having seen how people live and work in the US will very likely help me make such a decision.

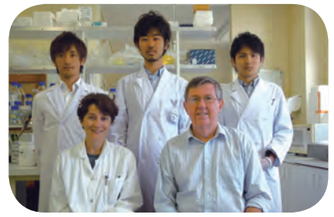
Finally, using this opportunity, I'd like to express my great appreciation to all people who helped my visit to Stanford. Thank you.

Report 09

My valuable experience at Australian National University

Yosuke Ojima
4th year student, Faculty of Medicine
Project Semester in Australia

ALL TMDU STUDENTS are required to undertake a six-month research project named Project Semester. I had the chance to go to the John Curtin School of Medical Research at Australian National University (ANU) as a part of my Project Semester. ANU is located in Canberra, the capital city of Australia.


Professor Philip Board and Ms. Jean Cappello taught us many things.

Canberra is a planned city built as the new capital between Sydney and Melbourne at the beginning of the 20th century. There is a large lake at the center of city, which was designed based on several geometric motifs such as circles, triangles and axis. The ANU campus is a very large and we can see rabbits, possums and many kinds of birds on the grounds. I did my research in the Molecular Genetics Laboratory under the supervision of Professor Philip Board. My work at the ANU was to purify proteins.

The outline of my experiment is as follows. Plasmids which contained the gene of the target protein were transfected into the competent cells (bacteria). I obtained the protein by culturing these cells that produce the target protein followed by cell lysing to break down the cell wall. However, this cell culture contained other mixed proteins, so I had to purify the protein I was interested in. Of course, not all procedures went smoothly. Sometimes my target protein precipitated out, against my wishes. When this happened, my supervisor gave me some appropriate advice. Finally, I obtained and purified the target protein. All the steps I had to take to get to that result required critical thinking and perseverance. I have adopted a researcher's mind by practicing these important values.

The people I met in Australia were very kind and welcoming. Professor Board drove me around Canberra and took me to Tidbinbilla National Park. I saw a lot of animals there, such as kangaroos and koalas. After that, he invited us to his house. I enjoyed a barbecue in his beautiful garden, enjoying some great Aussie beef! He also arranged a Canberra Hospital Tour for me, where I learned the differences between Australian hospitals and Japanese hospitals.

The striking new building that houses the John Curtin School of Medical Research, where we did our work.

Also, the PhD students were very kind. For example, they gave me many tips on life in Canberra. We did a lot of things together such as mountain climbing at Black Mountain, dinner at a Chinese restaurant and stargazing. The most memorable thing was to celebrate Chinese New Year. The party was held at Graduate House and we each brought a dish. We had dumplings, fried rice, chicken wings, curry and so on. We enjoyed all the dishes and the conversation. They also organized a farewell dinner for me.

January 26th is Australia Day. All Australians celebrate this holiday and many events were held at the lakeside. I enjoyed the free barbecue breakfast, the Flag Raising ceremony, the prime minister's speech, Flyover, Gun Salute and Dragon Boat race. Although Canberra is usually a quiet city, it becomes lively with people on holiday. The festival ended with fireworks by lakeside. I was impressed that Australians love their country deeply and patriotically on one hand and welcome multinational people warmly on the other.

Finally, I would like to express my deepest gratitude to all the relevant staff members and students at ANU and TMDU. In particular, I must thank Professor Board and Professor Yoshinobu Eishi gave me a wonderful opportunity, Ms. Jean Cappello who taught me a lot at the laboratory, and the PhD students who made my stay an exciting and memorable one.

Last but not least, many thanks to my classmates Shungo Aratake and Shohei Tsujino. We supported each other and worked together at ANU. I will never forget my days in Australia, and I would like to return to that great country someday.

Canberra is a planned city. This view of the beautiful city is from Mt. Ainslie.

The ANU campus is very large. I enjoyed the wonderful natural views available, such as this one.