

Growing TMDU Network in Latin American Countries: Academic, Educational and Clinical Collaborations

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IN 1968, PROFESSOR Tadashige Murakami, former professor of surgery of TMDU, visited Chile to give a lecture on gastric cancer. This was the start of a long relationship between TMDU and Chile. In the 1970s, the Japan International Cooperation Agency (JICA) launched a project for the early detection of gastric cancers in order to reduce their high mortality rate. The Gastric Cancer Center in Santiago was founded in 1977 at the Hospital Paula Jaraquemada (now the Hospital Clinico San Borja Arriaran), and this center has long played a major role in the project. TMDU has dispatched numerous experts there to support the prevention of gastric cancer. The Gastric Cancer Center was later renamed the Chilean-Japanese Institute for Digestive Diseases, and it still contributes to maintaining the health of the Chilean people.

Colorectal Cancer Screening in Chile, Supported by TMDU

In Chile, mortality from colorectal cancer has been increasing in the last two decades, and thus the need for colorectal cancer screening has grown rapidly. Approval was given in 2009 to start a screening project based on a proposal from Dr. Lopez of Clinica Las Condes (CLC), one of the biggest and most advanced hospitals in Chile. Due to the long history between TMDU and Chile, TMDU was invited to supervise the project. In 2009, the Ministry of Health of Chile, CLC and TMDU signed a collaborative agreement concerning colorectal cancer screening, and the Latin American Collaborative Research Center (LACRC) was established at CLC in 2010. Over the years, TMDU has continuously sent experts in pathology, endoscopy and research to LACRC. Since 2012, PRENEC (the Pre-

vention Project for Neoplasia of Colon and Rectum) has been implemented, using the Japanese method, which includes an immunological fecal occult blood test and colonoscopy.

The Chilean-Japanese Institute for Digestive Diseases at the Hospital San Borja Arriaran is the main facility for PRENEC in Santiago. The institute also serves as a training center for endoscopy. Many Chilean doctors have taken a training course in endoscopy, acquiring the skills required for cancer screening. The institute's endoscopy unit has been redesigned for PRENEC, with extensive support from the Japanese Embassy in Chile.

In December 2017, TMDU's ex-president Takashi Ohshima received the Order of Bernardo O'Higgins from the Government of Chile in appreciation of TMDU's contributions in Chile.

LACRC Members and University Activities

LACRC has been staffed by experts from the pathology, endoscopy and molecular biology divisions of TMDU. As of 2010, LACRC has been operated by nine TMDU doctors: Dr. Takashi Ito (April 2010 to March 2012) and Dr. Hiroshi Kawachi (March 2012 to March 2015) as pathologists, Dr. Hiroyuki Uetake (July and August 2010), Dr. Tetsuro Nishikage (January 2011 to January 2012), Dr. Koji Tanaka (January 2012 to April 2013), Dr. Takuya Okada (April 2013 to March 2015), Dr. Masahiro Tsubaki (October 2014 to September 2015) and Dr. Tomoyuki Odagaki (November 2014 to present) as endoscopists and Dr. Maki Kobayashi as a molecular biologist (July 2012 to March 2015). In November 2017 and August 2018, Dr. Masamichi Yasuno visited Chile to supervise colorectal surgery conducted by local surgeons (Fig. 1).

LACRC is currently operated at TMDU headquarters by Prof. Tetsuya Taga (Executive Senior Vice President), Prof. Masanobu Kitagawa (Prin-



cipal Deputy Director of Faculty of Medicine, Department of Comprehensive Pathology), Prof. Uetake (Department of Specialized Surgeries) and other staff members. In order to inspect LACRC's activities, Prof. Taga visited Chile in July 2018 (Fig. 2).

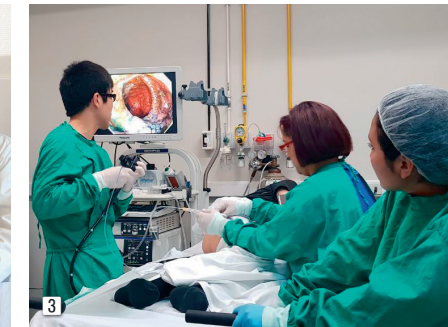
In Chile, Dr. Odagaki is the present chief of LACRC, and he is engaged in PRENEC as an instructor of colonoscopy to Chilean doctors. His prominent techniques, including endoscopic resection for superficial cancer, have been in great demand. Many patients are referred to him not only from Santiago, but also from other parts of Chile (Fig. 3). Dr. Odagaki is also a supervisor in the stomach cancer screening project conducted by the Chilean Endoscopic Society.

TMDU operates the Project Semester Program, appointing medical students to institutions overseas. In 2018, two medical students from TMDU were sent to laboratories at the University of Chile, and they conducted advanced research in collaboration with local doctors.

Public Release of PRENEC Results in Medical Journals and Congresses

The colorectal cancer screening system of PRENEC has achieved excellent results, detecting many cancer cases. Owing to the experts from TMDU, the completion rate of the screening procedure and the detection rate of colorectal cancer have improved remarkably. Furthermore, most of the cancers detected by PRENEC were early intramucosal cancers without risk of metastasis, and these lesions were treated successfully by endoscopy. These results have been reported in various medical journals by past doctors. More reports related to PRENEC results are in progress for future publication.

In June 2018, Dr. Odagaki made a presentation on the PRENEC colonoscopy training system at an international congress (Digestive Disease



Week in Washington DC).

In August 2018, Endosur, an international symposium on digestive disease, was held in Santiago. Prof. Yoshinobu Eishi (Department of Human Pathology) and Dr. Yasuno from TMDU and Dr. Odagaki from LACRC participated in this symposium and gave presentations (Fig. 4).

Expanding TMDU-PRENEC Network in Latin America

PRENEC and supporting activities by TMDU are now recognized as essential aspects of Chilean healthcare. Increasing numbers of participants have enrolled in PRENEC in six major cities: Santiago, Valparaiso, Punta Arenas, Coquimbo, Osorno and Valdivia. While the TMDU-PRENEC network is still spreading throughout the country, additional cities and facilities have concluded agreements to join PRENEC in the near future.

TMDU has also promoted the same screening system in other Latin American countries, in association with JICA and the International Cooperation Agency of Chile (AGCI). In August 2015, the First International Training Course for Colorectal Cancer Screening took place in Santiago. TMDU experts participated in the course as instructors and gave lectures to doctors from Ecuador and Colombia. In 2016 and 2017, the same training course was held in Santiago for medical professionals from Bolivia, Paraguay and Peru. In Paraguay, the PRENEC pilot study has finished and preparation for PRENEC's full-scale launch is underway (Fig. 5).



[2] Dr. Chomali (the director of CLC), Prof. Taga, Dr. Mañalich (the CEO of CLC) and Dr. Lopez (the chief of PRENEC)
[3] Dr. Odagaki performing an endoscopic procedure
[4] Prof. Eishi giving a presentation at Endosur

[5] A symposium related to PRENEC in Paraguay

[1] Dr. Yasuno performing a surgical procedure



Activities for Strengthening Relationships between TMDU and Thai Universities

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Student Exchange Programs between TMDU and Thai Universities

In 2018, fruitful active student exchange programs were conducted between TMDU and Thai universities. Table 1 shows the number of inbound and outbound students in each affiliation. A total of 42 Thai students came to TMDU and 40 TMDU students visited Thailand for short-term exchange programs or research projects. Table 2 shows the number of Thai students, most of them post-graduates, who have studied under the official TMDU curriculum during the 20 years between 1998 and 2018. After graduation from TMDU, they have been contributing to the expansion of healthcare field networks.

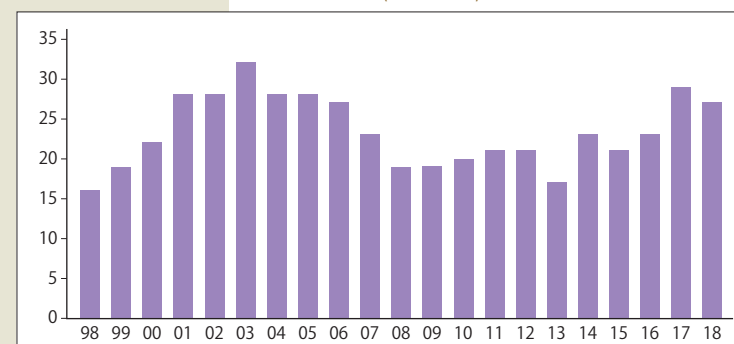
International Faculty Development Course

International Faculty Development Course (IFDC) was established in 2016 with the purpose of introducing TMDU's expertise in dentistry to other countries. Since conception, it has been expanding and improving its offerings and scope.

Table1 Number of exchange students between TMDU and Thai universities in 2018

	Inbound	Outbound
Faculty of Medicine	13	23
Faculty of Dentistry	15	15
Graduate School of Medical and Dental Sciences	0	2
Institute of Biomaterials and Bioengineering	14	0
Total	42	40

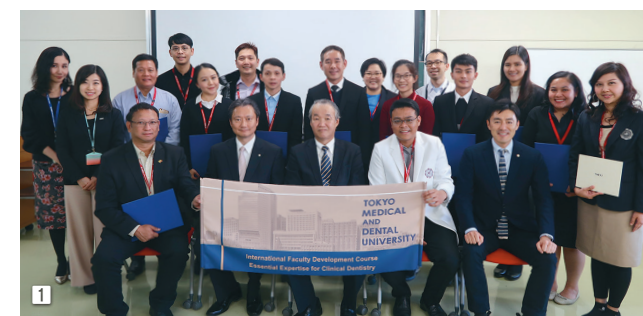
Table2 Number of Thai students in TMDU (1998-2018)



The dental faculty of TMDU have always set a goal of responding proactively to overseas needs in terms of research, education and service. IFDC, developed and taught by our experienced faculty, welcomes dental healthcare professionals from all over the world.

IFDC 2018 was held from November 27 to December 6, and in a joint discussion with Thai alumni and university faculty, this year's theme was set as "Gerodontology." Many lectures and hands-on sessions were provided to update and improve the skills of participants from Thailand, Indonesia and Myanmar. Ten Thai dental professionals (university faculty) with various specialties joined this program. TMDU has a long history of actively supporting student exchanges, and this course also promotes positive exchange between faculty and dental professionals.

In accordance with the theme, this course covered various topics pertinent to aging or aged societies. For example, the lecture "The current stream of implant overdenture" gave a perspective on the use of new implant overdenture (IOD) (1-IOD and mini implant overdenture) as another option to the standard IOD for edentulous jaws. Also, the lecture and hands-on session "Composite resin restoration for tooth wear" covered the power of direct composite restorations, followed by discussion about its potential for severe tooth wear from clinical and scientific perspectives. The lecture and hands-on session on periodontology detailed updated regenerative therapy using



1 Participants of IFDC 2018 with TMDU faculty



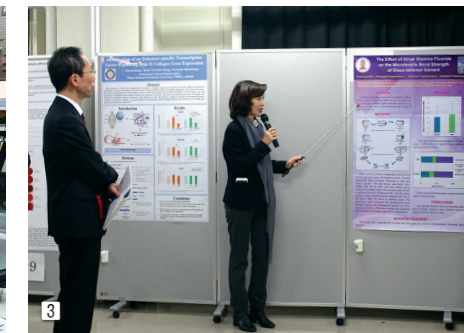
various biomaterials and minimally invasive modalities through the use of advanced periodontitis cases.

In addition to the above line-up, the topics of "management of patients with systemic diseases for dental treatment," "implantology," "dysphagia," and more were also covered, along with a dental materials company tour and a TMDU dental hospital observation experience. Needless to say, as an educational institution, we felt the need to introduce the educational possibilities of ICT through "simultaneous broadcasting," a new type of live lecture that broadcasted the clinical scene of border molding to the classroom. Through this technology, an entire classroom can easily observe the clinical situation and ask questions during a procedure, which reduces crowding in a clinical setting. We received wonderful feedback from participants and were honored to have a new group of doctors complete the IFDC course.

Tri-University Consortium

The 6th Tri-University Consortium was held on November 30, 2018 at TMDU. This consortium was contracted in 2010 between Chulalongkorn University (CU), Peking University (PU) and TMDU. The first meeting was held in 2011 at CU, with following meetings held every year in rotation. This was the second time TMDU hosted the meeting. Prof. Guo, Dean of the School of Stomatology, PU, and Prof. Poolthong, Dean of Faculty of Dentistry, CU, attended this meeting alongside 19 participants from their respective universities.

The morning session started with keynote presentations by the deans from PU, CU and TMDU. First, TMDU's Prof. Okiji, dean of the Faculty of Dentistry, introduced TMDU's educational system and recent research activities and developments, including an active discussion on cutting-edge research topics and dental education systems for the next generation.



Then, the latest research results of each university were introduced. From TMDU, Professors Shibata and Ono gave lectures entitled "Structural features of developing mandibular condylar cartilage" and "Do you always need the golden axe? The temporary anchorage device and an alternative." There were also oral presentation sessions in the morning.

In the afternoon, a visit to the GC Corporate Center laboratory was offered with the support of the GC Corporation. The participants observed and learned the current development of Japanese dental materials and equipment. The company's initiative for dysphagia rehabilitation was also introduced.

A poster presentation session was conducted in the evening, which was a joint program with the annual meeting of the Stomatology Society of Japan. Twenty posters were presented by members of the Tri-universities. The consortium successfully concluded through wonderful collaboration of all participants of the Tri-universities and many TMDU staff.

After the poster presentation session, all participants enjoyed a joint banquet of the Tri-University Consortium and the Stomatology Society of Japan. Here, guests from CU and PU deepened their camaraderie with the TMDU participants. Through the Tri-University Consortium, the relationships of all three participating universities were strengthened. Further inter-university collaboration on research and education is expected.

Coordinator of CU-TMDU Center

TMDU re-appointed Dr. Atiphan Pimkhaokham as the coordinator of the CU-TMDU Research and Education Collaboration Center for 2018 and 2019. He is a visiting Associate Professor at TMDU and also an Associate Professor in the Faculty of Dentistry at CU. Prof. Tetsuya Taga, Director of Institute of Global Affairs, presented the certificate to him at TMDU.



2 Hands-on session at IFDC 2018

3 Poster session at the Tri-University Consortium

4 Prof. Tetsuya Taga (left) and Dr. Atiphan Pimkhaokham (right)

Research Partnership between TMDU and the Noguchi Memorial Institute for Medical Research, University of Ghana

Ghana-Tokyo Medical and Dental University Research Collaboration Center

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Leader of TMDU-AMED/JGRID
Project in Ghana

Overview of the TMDU-AMED/J-GRID Project

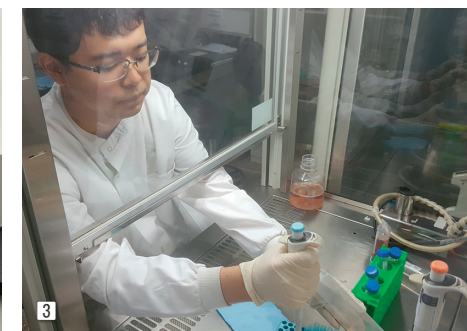
The Japanese Initiative for Global Research Network on Infectious Diseases (J-GRID) program has been carried out between TMDU and the Noguchi Memorial Institute for Medical Research (NMIMR) since 2008. The first and second terms of the J-GRID program, which were supported by the Japanese Ministry of Education, Culture, Sports and Technology (MEXT), were completed at the end of Japanese FY2014. The third term of the project started in FY2015 under the support of the Japan Agency for Medical Research and Development (AMED).

Dr. Mitsuko Ohashi, the TMDU professor associated with the project, was dispatched to Ghana as the team leader in 2015 and has since managed the Ghana-TMDU research collaboration center. Dr. Takaya Hayashi, project lecturer at TMDU, joined the project from FY2017 and started to work with her in Ghana. Currently, ten Japanese and ten Ghanaian researchers participate in the project, cooperating on multiple research projects. The main focus of the AMED/J-GRID project is to promote innovative research collaboration with researcher counterparts for developing new diagnostic methods, finding lead compounds for new drugs and identifying candidates for new

vaccines.

Under this concept, the TMDU AMED/J-GRID project conducts the following three research projects: (1) the surveillance and isolation of dengue viruses prevalent in Ghana; (2) the genetic analysis of rotavirus, which is the causative agent of acute diarrhea; and (3) the identification of carbapenem-resistant bacteria. To conduct research more efficiently, TMDU invited Japanese experts from Kitasato University and Nagasaki International University to build an “all-Japan collaboration team.” In 2018, we successfully isolated the dengue type 2 virus from Ghanaian patients. Interestingly, this virus possessed the same genotype as the outbreak strain found in Burkina Faso in 2016. This result suggested that the specific virus strain might spread further in Western Africa. Our genetic analysis of the rota virus showed that the vaccine strain disappeared from the field sites after the introduction of the vaccine, but re-emerged in 2018. Similar reemergence of vaccine strains was found in other geographic areas, such as India and Indonesia, suggesting this may be a global trend in the effect of the vaccine on rotavirus. The carbapenem-resistant bacteria was first found in Ghana in 2017 and the NDM-1 gene was then identified as the drug resistance gene within FY2017. The NDM-1 gene was encoded on a large plasmid DNA, the size of which was over 200 kbp. This plasmid was encoded with several drug resistance genes in addition to NDM-1. This is because the carbapenem-resistant bacteria accumulated other drug resistance genes which survived in Ghana, where antibiotics can be misused.

In 2018, a new research building named Noguchi Advanced Research Laboratories began operations. This building has several P3 laboratories and new equipment for infectious disease research. It is expected to accelerate collaborative research between TMDU and NMIMR. To achieve their goals, the Japanese-Ghanaian teams are actively pursuing further research.



Important Collaboration between TMDU and NMIMR, University of Ghana, in the Development of Human Resources

Collaboration between TMDU and NMIMR plays an important role in the development of human resources in Japan and Ghana. TMDU implements an educational program for medical students who want to gain experience at medical institutions overseas. Under this program, undergraduate students stay to carry out their research projects for a few months at NMIMR. In 2008, NMIMR had one such student. The visiting student worked with young Ghanaian scientists in the laboratory and field. The visit was a good chance for him to observe the medical system and research in a developing country such as Ghana, and will certainly prove useful for his career development. TMDU accepts young, talented researchers as Ph.D. students under the scholarship program supported by MEXT. In 2018, four Ph.D. students from NMIMR entered the doctoral course at TMDU. They joined the parasitology, virology and biochemistry departments of medicine at TMDU and started a “new research life.” They are expected to bridge TMDU and NMIMR moving forward, contributing to collaboration between the two institutions. Taking the importance of education of young Japanese and Ghanaian students and researchers into consideration, TMDU has expanded more intensive exchange activities not only with NMIMR, but also with the University of Ghana. President Y. Yoshizawa of TMDU and Vice-Chancellor E. O. Owusu of the University of Ghana signed a MOU of University-level exchange, and a new student exchange arrangement commenced. This University agreement between TMDU and the University of Ghana (including NMIMR) will strengthen the partnership between them even further.

90th Anniversary Symposium of Dr. Hideyo Noguchi's Arrival in Ghana

Dr. Hideyo Noguchi arrived at Ghana in 1927 and tried to identify the causal pathogen of yellow fever. Unfortunately, he died in the same year due to an infection caused by the same disease. When he died, an autopsy document was recorded, but nobody knew where it was stored for a long time. TMDU staff at the Ghana-TMDU collaboration center conducted a search and found it in the archives. The Japanese embassy and the Dr. Hideyo Noguchi Memorial Museum in Fukushima prefecture were informed of this news, and the autopsy record was finally gifted to the museum through the kind support of NMIMR. Because Dr. Noguchi belonged to the Rockefeller Institute for Medical Research when he died, his body was transferred from Ghana to New York and buried there. Thus, there were no historical documents or materials related to his death in Japan, making the autopsy document a valuable record for Japan. A presentation ceremony for the autopsy record was held in June 2018. In addition to TMDU staff in Japan and Ghana, Mr. Himeno, the ambassador of Japan to Ghana and Professor Anang, the director of NMIMR, attended the ceremony. News of the event was reported on television and in newspapers, attracting considerable attention.



⑤ The autopsy record of Dr. Hideyo Noguchi
⑥ The presentation ceremony at Dr. Hideyo Noguchi Memorial Museum in Fukushima prefecture

① Vice President T. Taga and TMDU-AMED J-GRID members

