International Joint Degree Master's Program in Agro-Biomedical Science in Food and Health

2018

The second semester report

國立臺灣大學
National Taiwan University

The Second Semester Report

National Taiwan University

February – August, 2018

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Global Innovation Joint-Degree Program

Mission

To create a suitable borderless university environment system for entrepreneurship through education and innovation to resolve local and global “unmet” social needs, especially in food production and safety, public health and maintenance, disease prevention and treatment.

Introduction

Both food and health are closely related to human survival and cannot be separated from each other; in recent years, due to food safety problems and living habits change, there are more and more related diseases, which cause a heavy medical burden.
The GIP program is dedicated to cultivating international talents with medicine, biotechnology, agriculture, and health science knowledge. Hoping this course can link agriculture and medicine together to solve the problems that arise from food.

Meet NTU GIP-TRIAD Director

Tsai-Kun Li, *Ph. D.*

Also serving as :

Associate Dean for International Affairs, NTU College of Medicine
Executive Officer, NTU Centers of Genomic and Precision Medicine
Director, NTU College of Medicine International Affairs Office
Project NTU SPARK Program
Professor, Department of Microbiology, NTU College of Medicine

Expertise :

Cancer biology, Topoisomerase-related drugs, DNA damage and repair

Email : tsaikunli@ntu.edu.tw

Faculty Members

Courses Introduction

Title	Agriculture of Taiwan		
Objectives	To help students to broaden their view and understanding of agriculture of Taiwan from many aspects.		
Outline	The course comprises agriculture-related topics, each of which being lectured by expert or teacher from the departments of College of Bioresources and Agriculture, providing students who are interested in agriculture an overview of the current situation of Taiwan's agriculture.		
Coordinators	Shu-Jen Wang	Credit	2.0

Title	Cellular Network of Biological Molecules		
Objectives	To enhance the international learning and interactions by Video connection with Kyoto University to proceed the English-taught lessons and topic discussion. There are opportunities to go to Kyoto University for academic exchange.		
Outline	This course contains the introduction of intracellular message molecules, mechanism, pathway, and their participation in cellular function regulation and biological responses. These cellular signals may be transmitted with specificity and/or commonality in the organism. Therefore, important examples from animal and plants to microbes will be introduced in the course.		
Coordinators	Tang-Long Shen	Credit	2.0

Title	Bio-entrepreneurship Training		
Objectives	1. Students will be able to explain/describe current situation of Taiwanese corporation; 2. Students will be able to explain/describe corporation management including marketing, finance, collaboration, brand, positioning, and value proposition		
Outline	In this course, we will nurture potential entrepreneurs in Bio-related fields. Through the examples of businesses in Taiwan, students will study fundamental knowledges required for starting/managing businesses (ex; corporate organization, corporate management, Industry-Government-Academia Collaboration, Brand, marketing, positioning, value proposition, etc.). Additionally, we will visit biocorporationin Taiwan to promote better understanding of actual corporate situation. Students will be graded by class attendance and report about business model.		
Coordinators	Ning-Sing Shaw	Credit	2.0

Title	Research and Development for Agro-Biomedical Science II		
Objectives	1. To be able to survey the research topics of instructors in Master's program in Agro-Biomedicine. 2. To be able to explain subjects and methods of each experiment/analysis. 3. To be able to explain and discuss about results and interpretation of each experiment/analysis. 4. To be able to explain the purpose of each experiment and analysis in the current research topic. 5. To be able to explain the significance of the current research topic from the standpoint of Agro-Biomedical Science.		
Outline	In this course, students learn the principles and methodologies of research related to Agro-Biomedical Science through spending 72+ hours with a specific research theme in a lab managed by instructors. The instructors from National Taiwan University will nurture the expertise of Health and Food sciences. Student must submit the report of research progress which will be evaluated by the instructor who hosts the student.		
Coordinators	Hsinyu Lee, Tsai-Kun Li, Chang-Chuan Chan, Ming-Ju Chen, Tang-Long Shen, Han-Yi E. Chou, Chau-Ti Ting	Credit	2.0

Title	Principle and Application in Health Research Methods		
Objectives	The aim of this course is to introduce concepts of study design, data collection and statistical analysis commonly used in public health research with a strong focus in global health.		
Outline	The module will be delivered over one semester, as a blend of small group work and lectures, practical exercises, group project, presentation and in-class discussion of reading tasks.		
Coordinators	Wei J. Chen	Credit	3.0

Title	DNA Processing in Drugs, Diseases and Health		
Outline	Through interactive teaching, topical group discussions, give students DNA processes (eg, DNA replication, transcription, repair) related basic knowledge and research methods. Develop correct research cognition and spirit, explore the mystery and experience inheritance of biomedical science, and make a series of analysis, explanation and explanation for the six emerging research topics in depth.		
Coordinators	Tsai-Kun Li	Credit	1.0

Title	Biomedical Translation Boot Camp		
Objectives	1. Students with a pre-identified unmet biomedical needs are expected to be equipped with crucial biomedical approaches and translational technologies to resolve these unmet needs. 2. Students are anticipated to achieve a basic understanding in their identified areas in which they may have received formal education and research activities. 3. Students will be able to plan and implement their field practicum work related to Food and Health; 4. Students will be able to identify social and natural environment-related issues/challenges in R & D from their practicum experience; 5. Students will be able to hold discussions with faculty and related persons about their ideas for their implementation plan.		
Outline	In this course, students plan and implement biomedical and translation research lab related to unmet needs of food security and global health and identify social and natural environment-related issues/challenges in R & D. aiming to provide basics and trainings for building and boosting skill sets of students for a community of solutions for the unmet needs. This boot camp aims to initiate and engage graduate students in a process to translate evidence-based medical care and food security into locally relevant and globally appropriate approaches and technologies, especially on the aspects of biochemistry and molecular biology. Students shall implement their own identified unmet needs and work optionally in the relevant labs while regularly holding discussions with course faculty members. After completion of combined course time, lectures and training with optional laboratory work, students must submit the report of research progress which will be evaluated by the course coordinators and respective instructors who host the students. The Bootcamp will conclude with a “Student Biomedical and Translational Research Symposium” open to all faculty, researchers and students. During preparation, MCB students will be provided with optional personal tutors/instructors.		
Coordinators	Tsai-Kun Li, Han-Yi E. Chou, Shu-Chun Teng, Chang-Chuan Chan, Hsin-yu Lee, Ming-Ju Chen, Tang-Long Shen	Credit	2.0

Title	Contemporary Issues in Global Health		
Outline	This Contemporary Issues in Global Health is designed for doctoral students, majoring in global health. This course will provide students with knowledge of cross-cutting global health theme and global burden of diseases, and ways of working together to improve global health. In addition to lecture, it will cover global health cases in Asia an Africa.		
Coordinators	Chang-Chuan Chan	Credit	3.0

Title	Fusion of Field and Laboratory Studies		
Objectives	1. Students will be able to plan and implement their field practicum work related to Food and Health; 2. Students will be able to identify social and natural environment-related issues/challenges in R & D from their field practicum experience; 3. Students will be able to plan and implement R & D with the potential to accommodate the identified issues/challenges; 4. Students will be able to hold discussions with faculty and related persons about their ideas for their implementation plan; 5. Students will be able to demonstrate the abilities for project management needed to connect the multifaceted issues that arise.		
Outline	In this course, students plan and implement field practicum related to Food and Health and identify social and natural environment-related issues/challenges in R & D. Students implement their own R&D based on the issues/challenges they have identified in the field and worked on in the lab while regularly holding discussions with course faculty. Combined practicum time in the field and laboratory is 90 + hours. Student must submit the report of research progress which will be evaluated by the instructor who hosts the student.		
Coordinators	Hsin-yu Lee, Tsai-Kun Li, Chang-Chuan Chan, Ming-Ju Chen, Tang-Long Shen, Han-Yi E. Chou	Credit	3.0

Title	Measuring burden of disease: methods and applications		
Objectives	At the end of the course the students are expected to: 1. Understand the key concepts and elements in burden of disease studies 2. Comment on the strengths and limitations of burden of disease studies 3. Understand the estimating procedures of the GBD study 4. Be familiar with and be able to use the major databases of GBD while acknowledging their limitations		
Outline	The measurement and quantification of population health could assist health policy making and priority setting. In the past few years there have been major advancements in burden of disease research, mainly led and stimulated by the Global Burden of Disease Study (GBD). This course will give an overview on the concepts and methods used to quantify the burden of disease at the national and global level. The GBD will be a main focus of this course, but other alternative approaches will also be reviewed. The course consists of lectures, computer labs, a hands-on group-based project, and a field visit to the Department of Statistics of Ministry of Health and Welfare.		
Coordinators	Hsien-Ho Lin	Credit	2.0

Title	Food Safety & Health		
Objectives	Students who join this class will have a clearer eye into food safety issues after they learn about the aforementioned knowledge.		
Outline	It has been said that the evolution of human is parallel with that of food in most culture. An old saying from ancient China also indicates that meal is of paramount importance to everyone from the emperor to lay persons. Food-seeking has been the centerpiece of daily life within the history of ancient human, but in nowadays, the civilized one seldom worry about how to feed themselves; their concerns extend to how to ensure the quality of food they obtain. The art of cuisine thereby sprouts, with the emergence of royal feast (given the floridness of dishes) and different ways of cooking (given the diversity of tastes). Modern cooking incorporates techniques such as fry, broil, sauté, stew, grill, etc. and we even harness additives to color and season our food. A whole new business now surfaces, the food industry. However, whether these "processed" food are healthy or not is still an open question. More and more consumers would like to know the ingredient and component of their food, what kind of additives have been blended in, how to be sure and who can be sure that these additives are safe, and what will happen if these additives are ingested in excess amount. Owing to the scarcity of accurate information and the prevalence of boasting advertisement, many people now have great concerns about the content of their dishes. Although these questions do remain, there are existing approaches to address these questions scientifically, the most important of which are the standardized toxicological studies. In this curriculum, we will introduce the basics of toxicological approaches to food safety issues, give examples about how this approach can be utilized to gauge additive toxicities, with the aim to provide those who are interested with knowledge about the history and evolution of the toxicology. Food safety is now an important topic drawing attention from scientists, mass media, and the public sector; it encompasses two dimensions, one including the traditional definition of safety, which is reassured using the status quo techniques, while the other one includes safety in the future promised by the ever-changing faces of sciences that can be beyond our imagination. This can be illustrated by controversies surrounding the pros and cons of supplemental vitamin intake, the health effect of deep-fry food, and others. Risk assessment and interpretation is then introduced in the modern era of toxicology, with the aim to assist administrative entities in formulating appropriate regulations for all stakeholders of the food industry to follow, and in preventing the harmful influences of potential toxic substances. A science-based policy making and a high degree of transparency regarding policy formulation and communication is what we need in the current era, in order to regain the public's confidence and trust in food safety in this country.		
Coordinators	Chih-Kang Chiang	Credit	2.0

Title	Applied Translational Microbiology		
Objectives	This program aims to enable students in learning the biodiversity and in translation usage of the bioresources in Taiwan.		
Outline	Example is given as the following with a focus on Cordyceps spp. Participating students will have to attend a field trip involving in collecting indigenous fungi, in particular the fungi infected insects and known to be used in Traditional Chinese medicine (TCM), such as Cordyceps spp. In addition, students will also practice to identify, cultivate and analyze the collected fungi. In this program, bioassays and toxicological test will be conducted to investigate any of their potential usages in medicine and healthy supplement to improve the global health. At last, the protocols for cultivation and fermentation growth in vitro of the Cordyceps spp. will be learned and it is important for future industrialization.		
Coordinators	Tang-Long Shen	Credit	3.0

Title	Agro-Biomedical Science Laboratory Seminar II		
Outline	In this course, students attend laboratory seminars provided by 10 invited speakers, and read research articles related to Food and Health, thoroughly understanding their research objectives, methodologies and results, then discuss the significance of the studies, problem areas, and remaining areas for further study. In some cases, it may be possible for students to similarly approach Innovation-related issues in another form than academic article. The instructors from National Taiwan University will nurture the expertise of Health and Food sciences, and the ability to find and solve the problems in Asian society and nature.		
Coordinators	Hsin-yu Lee, Tsai-Kun Li, Chang-Chuan Chan, Tang-Long Shen, Chau-Ti Ting, Han-Yi E. Chou	Credit	1.0

Title	Internship in Taiwan I		
Outline	Students enrolled in this course participate in at least 90 hour corporate internships at corporate sites and/or private research establishments to study corporate culture in Taiwan. Internship sites are chosen from either selected companies holding written agreements with the university, or other sites selected by the student and approved by the relevant program committee. Following their internships, students compile a report about the experience and make a presentation on it to faculty and their peers.		
Coordinators	Hsin-yu Lee, Tsai-Kun Li, Chang-Chuan Chan, Tang-Long Shen, Chau-Ti Ting,. Han-Yi E. Chou, Wei J. Chen, Shu-Jen Wang.Chi-Te Liu	Credit	3.0

Title	Environmental and Occupational Health		
Objectives	Be familiar with environmental factors affecting human health. Can summarize and interpret variables and indicators commonly used in the field of environmental and occupational health.		
Outline	Introduce the core knowledge in environmental and occupational health. Understand the real-world application and practical issues through site visits. (The site visits may be arranged outside regular class time.)		
Coordinators	Ching-Yu Lin	Credit	3.0

Title	Biotechnology in Milk Products*		
Objectives	The course invites students in different departments to reflect and explore the cultural presumptions of knowledge that are either taken for granted, or at least play an important part in our modern life.		
Outline	This course examines the culture and institutions of knowledge production and dissemination. The subjects under study include both scientific and non-scientific knowledge. It reviews four themes: 1. culture of academic institutions and disciplines; 2. culture of scientific knowledge; 3. oral and print culture; 4. cultures of non-intellectual knowledge, such as health, diet, sex, and nationality.		
Coordinators	Ming-Ju Chen	Credit	3.0

*The course was called off in 2018, and will begin again in 2019.

Title	Molecular Nutrition: Genomic, Metabolic and Health Aspects*		
Objectives	1. Understand the field of molecular nutrition. 2. Learn the constitutional mechanism of nutrition and diet 3. Be familiar with the ways to maintain ideal health situation by nutrition control. 4. Learn about how the nutrient content influence genetic diseases.		
Outline	The course is conducted in English and proceed synchronously in University of Mississippi, National Taiwan University, National Taiwan Normal University and Fu Jen Catholic University via video conferencing. The course is about nutritional biochemistry, nutritional genomics, nutritional metabolism and epigenetics. Investigating the effect of diet and nutrition on metabolism, and the manner of influencing health at molecular level. This course is mainly for senior and master students.		
Coordinators	Yi-Chen Lo	Credit	2.0

*The course was called off in 2018, and will begin again in 2019.

Welcome to Taiwan!
Getting started for Life in NTU!

Date: Feb. 22, 2018.

Venue: NTU Shui Yuan BOT dormitory

Purpose: Welcome students to come to NTU as well as establish and help them with their needs in life.

The GIP-TRIAD office, the UT Taiwan office and the National Taiwan University students worked together to welcome GIP students and relieved their fatigue. They also helped students to check in the Shui Yuan BOT dorms, purchased necessities, and set up mobile phone, mobile networks and dormitory networks. Moreover, they introduced the surrounding environment, Gong-Guan area to students, hoping them prepared well for the next semester in the future.

Welcome Forum for International Students

Date: Feb. 23, 2018.

Venue: Room 101, Boya Teaching Hall, NTU

Purpose: Introducing the courses, research topics, industrial internships in the semester at the National Taiwan University and let students introduce themselves to each other.

Every international students and GIP students must attend the illustration meeting organized by National Taiwan University International Affairs Office and the GIP-TRIAD Office. The international student illustration meeting was held in Room 101 of the Boya Teaching Center of National Taiwan University, and was assisted by NTU students to give international students a deeper understanding of the course.

GIP-TRIAD Freshman Guidance

Date: Feb. 23, 2018.

Venue: the first meeting room of the Administration Building, NTU

In the afternoon, they moved to the first meeting room of the administrative building and hold a GIP-TRIAD illustration meeting. The illustration meeting was hosted by Professor Tsai-Kun Li, the director of GIP-TRIAD, and Professor Ryosuke Ohniwa, UT Taiwan office. Two professors introduced the course and the requirements of the semester at National Taiwan University to students and leaded them to choose the laboratory according their interests. They also took a brief talk about the colorful life in Taiwan, and some important reminders. In addition, there were opportunities for industrial internships during the semester, so the cooperated company was introduced as well, including the company's products and expertise, so that students can prepare for the internship earlier.

GIP Delegates Visiting National Taiwan University

Date : Mar. 5, 2018

University of Tsukuba

Prof. Yoshito Kumagai
Environmental Biology Laboratory, Faculty of Medicine, University of Tsukuba & Coordinator, GIP-TRIAD program

Other members

University of Tsukuba
Prof. Masao Ichikawa
Division of Educational Renovation Support Educational Planning Section Official, University of Tsukuba
Ms. Youmei Wang

Université de Bordeaux

Prof. Dominique Rolin
PhD in Biology and Plant Physiology & Professor, Université de Bordeaux

Other members

Université de Bordeaux
Prof. Michel Hernould
Prof. Catherine Benneteau

National Taiwan University

Prof. Tsai-Kun Li
Associate Dean for International Affairs, College of Medicine & Director of GIP-TRIAD Office, NTU

Other members

Vice President for International Affairs, NTU
Prof. Luisa Shu-Ying Chang
Dean for College of Public Health, NTU
Prof. Chang-Chuan Chan
College of Life Science & Director of Center for Biotechnology, NTU
Prof. Hsinyu Lee
College of Public Health, NTU
Prof. C. F. Wu
College of Bioresources and Agriculture, NTU
Prof. Shu-Jen Wang
Prof. Ming-Ju Chen
Prof. Tang-Long Shen
Prof. Kai-Yi Chen
Prof. Hsiao-Feng Lo
College of Medicine, NTU
Prof. Chih-Kang Chiang
Prof. Han-Yi E. Chou
College of Life Science, NTU
Prof. Chau-Ti Ting

GIP-TRIAD Delegates at NTU Headquarters

Date : Mar. 5, 2018. 09:00-12:00

Venue : Room 418, 4th Floor, Second Administration Building, National Taiwan University

Purpose : The representatives of three universities conducted discussions with NTU head-quarter administration

Welcome representatives came to National Taiwan University to conduct a deep discussion about the program development in the future. They consolidated the opinions from different universities to ensure the safety and welfare of students in each school and their future development. After the conference, they went to the Living One dining room for lunch.

NTU GIP Promoting Event

Date : Mar. 5, 2018. 14:00-15:20

Venue: Conference Room 1, Administration Building, NTU Main Campus

Purpose: Introducing GIP-TRIAD master degree program to students of NTU

To introduce this program to students studying in NTU, the NTU GIP-TRAID office held this session and invited representative of professors from each university (NTU, UT and University of Bordeaux). First of all, Prof. Tsai-Kun Li briefly introduced the purpose and specificity of this program. He introduced the things student have to learn in Taiwan as well. Secondly, Prof. Yoshito Kumagai introduced the curriculum of GIP program in Tsukuba University. Third, prof. Dominique Rolin introduced the semester of GIP program in France. In the end of session, the students studying in GIP program shared their true experience to the NTU students with hesitation.

NTU GIP-TRIAD Biotech Medicine Industry Seminar

Date： Mar. 6, 2018. 9:00-12:00

Venue： Conference room 1, the second floor of NTU medical college building

Purpose： Discussing the current issues of biotechnology, medicine and food with the professors from the top universities in Taiwan, Japan and French. By sharing the experiences in research field, it would connect industry, government and academic together.

The industry of biomedicine and biotechnology is the developing industry on which Taiwan government wants to focus on in the future. Hence, with cooperating with Biotechnology & Pharmaceutical Industries Promotion Office, MOEA, NTU medical college and NTU SPARK office, NTU GIP-TRIAD office held this seminar. We invited representative of professors from each university (NTU, UT and University of Bordeaux), having a transnational communication of the academic research in each country. First, Prof. Tsai-Kun Li, the associated dean of NTU medical college and the director of GIP-TRIAD, talked about NTU Entrepreneur Ecosystem. Next, Prof. Yoshito Kumagai, from Tsukuba University, gave a speech, about the advantage and disadvantage to human of electrophilic stress. Finally, Prof. Dominique Rolin, from University of Bordeaux shared their experience of promoting the development of science in France. By exchanging the experience of academic and culture, it would be expected to come up with some novel ideas. Moreover, we would adopt other's experience, to promote more cooperation between industry and academic.

Meet with Experts -
Prof. Jean-Marc Egly : Study and Research in France

Date : Apr. 20, 2018

Venue: NTU College of Medicine

Purpose: Encouraging students and sharing experience

Prof. Jean-Marc Egly is a famous scientist in France. Also, he is a world-known INSERM researcher. This time, when he came to NTU, he talked about how to study in France to the GIP students by chatting with them. Besides, he encouraged students to have an enriched life of master program.

Professor: Jean-Marc Egly

Title: Member of the Parliamentary Office for Strategic & Technologic Projects Evaluation
European Research Council Advanced Grant Award : Top 5%
Chercheur Top 1% according to the web of knowledge (H index 69), 15,000 citations

E- mail: egly@igbmc.u-strasbg.fr.

Field Trip –
Xitou NTU Experimental Forest

Date： Apr. 15-17, 2018

Venue: Xitou NTU experimental forest

Purpose: Experience collecting esculent/medicinal fungi in field and outdoor education Prof. Tang-Long Shen, the professor in college of bio-resources and agriculture of NTU, taught the class 'application of translation microbiology' of GIP-TRIAD. With experimental forest of college of bio-resources and agriculture's assistance, leading by Prof. Tang-Long Shen, Prof. Tsai-Kun Li (the director of GIP-TRIAD), Prof. Han-Yi Chou and Prof. Hiran A (from Sri Lanka, the professor of college of bio-resources and agriculture), 13 students (from NTU, UT and University of Bordeaux) went to Xitou, Fenghuang broadleaf ecological conservation area, Xitou nature education area and wood utilization and product exhibition center in Shuili from April 15-17. Besides, they went to national museum of natural science in Taichung, collecting esculent/medicinal fungi in field and outdoor education.

On the first day (April 15), all of the members gathered at the gate of NTU, then went to Fenghuang broadleaf ecological conservation area. The director of experimental forest, and researchers introduced the process of making tea and experienced tea culture. To the students of GIP-TRIAD, even Taiwanese students, it was the first time to experience the taste of Taiwanese high-mountain tea. Moreover, the director of experimental forest introduced Assam black tea, which only can be harvested 10 kg each year, to all the professors and students. Everyone thought the taste of Assam black tea, this tea plantation produced, was fantastic and extraordinary. Then, the collecting activity started. Everyone carefully observed the biodiversity (after 3 years of organic culture) in NTU Fenghuang tea plantation. The researchers and professors taught students how to find the answer of the various questions, such as pests and disease, ecology and evolution and crops culture. In the end, there was a wonderful ending with learning abundant knowledge about organic agriculture and ecosystem.

Left from NTU Fenghuang tea plantation, all the professors and students went to xitou nature education area, and visited xitou monster village, the most successful development of the leisure forest industry. On the second day, All professors and students took a class of Taiwanese biodiversity. Everyone was shocked by the forest, animals, insects, fungi, and various kinds of indigenous and exotic species.

After taking a rest, Prof. Hiran taught everyone about fungi diversity and application in the lecture room of Xitou nature education area. With the basic knowledge of fungi, all the professors and students observed the fungi they collected under microscope. To bring them back to laboratory and culture these fungi, they recorded their characteristics and type and separated them. Everyone concentrated on observing fungi by microscopy, and discussed what they found with others. Finally, they finished the whole-day work of collection and identification with hunger.

In the morning of third day, all professors and students went to wood utilization and product exhibition center in Shuili (belongs to NTU experimental forest), visited the wood utilization industry and learned the features of the products made by different kinds of wood. Simultaneously, everyone got a present, the chopsticks made by cypress which is planted in NTU experimental forest, as a souvenir. After ate the local delicious dishes, which were prepared by experimental forest, they finished the journey in NTU experimental forest. Next, they arrived the last place of this field trip-National Museum of Natural Science in Taichung. First, doctor who works at the fungi group of biology department of National Museum of Natural Science introduced the common and endemic medical fungus in Taiwan, including Ganoderma, Taiwanofungus camphoratus and Inonotus sanghuang. Then, doctor guided the specimen room of National Museum of Natural Science to everyone, introducing the collection and production of fungi specimens, preservation and search. After visited the tropical and fern garden, the GIP-TRIAD students finished the trip in NTU experimental forest.

Publish at May 30th written by shentllab

Industry Visit

Venue: Mucho Biotechnology CO., LTD

Purpose: Understanding the Taiwan biotechnology industry and seeking the opportunity of internship

Introduction: Mucho Biotechnology CO., LTD established in 2012. *Cordyceps Sinensis* is the main developmental things in their company. They develop some creative food by *Cordyceps Sinensis*. They want to promote biotechnology agriculture, agriculture products without toxicity, healthy industry and green life as well

NTU GIP-TRAID office provided students a chance for visiting Mucho Biotechnology CO., LTD. The participators were the 13 students of first GIP-TRIAD and 5 students of second GIP-TRIAD from Taiwan. *Cordyceps Sinensis* is a precious herb in the traditional Chinese medinice. Besides, it was reported with high nutritional value. By visiting Mucho Biotechnology company, including laboratories, show room and restaurant, students could understand how to culture *Cordyceps Sinensis* and how to make a dish of Cordyceps sinensis. By this unique biotechnology in Taiwan, students could realize the real case of combining biotechnology and agriculture together and seek the chance for internship.

Industry Visit –
I-MEI Foods Co., Ltd.

Date: May 18, 2018

Venue: The factory of I-MEI foods CO., LTD in Taoyuan Nankan

Purpose: Understanding the food industry in Taiwan and seeking the opportunity of internship

Introduction: I-MEI foods CO., LTD was found in 1943. Their concept of management is "Quality food making is not only a commitment to the people, but we also have a responsibility to the environmental conservation and promotion of local art and culture. " They not only promote environmental protection and charity business, but also provide the quality guarantee of food safety and sanitation.

As the biggest food factory in Taiwan, I-MEI foods CO., LTD has their own laboratory, strictly examining their products' quality. This time, by visiting I-MEI foods CO., LTD, the students would like to understand the food industry in Taiwan, realize the food examination process, and seek the chance of internship.

義美
Since 1934

Professor De Yongbao of University of Tsukuba and former Director-general of Ministry of Education, Science and Culture, Japan Education Bureau, visits the National Taiwan University

Date ： May 25, 2018

Venue： National Taiwan University

Purpose： Exchanging different opinions with De Yongbao, the professor of Tsukuba University and former Director-general of Ministry of Education, Science and Culture, Japan Education Bureau and seeking the chance for cooperation

The program director Professor Tsai-Kun Li met with De Yongbao, the professor of Tsukuba University and former Director-general of Ministry of Education, Science and Culture, Japan Education Bureau. During the meeting, Professor Li introduced the establishment of International Joint Degree Master Program and exchanged the experiences with Professor Yongbao. He hoped to enhance the diversity of international cooperation, highly cultivate in academic education, and create a new opportunity for higher education in the future.

The 1st National Taiwan University GIP-TRIAD Scholarship Awards Ceremony

Date: Jun. 6, 2018

Venue: National Taiwan University

Purpose: Encouraging excellent students

Shan-Chwen Chang, Dean of college of Medicine, Yu-Siou Lan, the vice president of Deyu Co., Ltd(Taiwan McDonald's), and other donors awarded the first "Excellent Scholarship for Master's Degree in Agricultural Biotechnology and Health Care in National Taiwan University" to Chen-Pang Wang and Szu-Chun Yang。

Government Institutions Visit-
Biotechnology and Pharmaceutical Industries Promotion Office, MOEA and NanKang Biotech Incubation Center

Date: Jun. 15, 2018

Venue: NanKang software park

Purpose: To understand the current situation of biotechnology development in Taiwan and resource introduction

Introduction: Biotechnology and Pharmaceutical Industries Promotion Office, MOEA is a group consisted with many departments founded by government. They work for being the crucial character of industry and information communication between domestic and oversea environments, promoting the domestic industry investment and integration, assisting industries to break their developmental bottleneck, promoting the upgrade of biotechnology medicine industry.

Biotech Incubation Center was founded in 2004, located in NanKang software park. They focus on the overall incubation concept from creative and innovation to start-up. They provide not only the technical assistant, but also the incubated service of business. They work for the integration of industry, research and the resource from government. With the concept of helping cooperative partners, they would like to make the newly established companies stronger.

After visiting biotechnology and pharmaceutical industries promotion office, MOEA and NanKang biotech incubation center, students realized how the Taiwan government help the company transform and upgrade, knew the current situation and bottleneck of the Taiwan biotechnology development, and where they could find the resource provided by government, such as Taiwan Biotechnology Industry Alliance which provide free consulting service, market analysis, examination etc.

Research Institutions Visit - Industrial Technology Research Institute

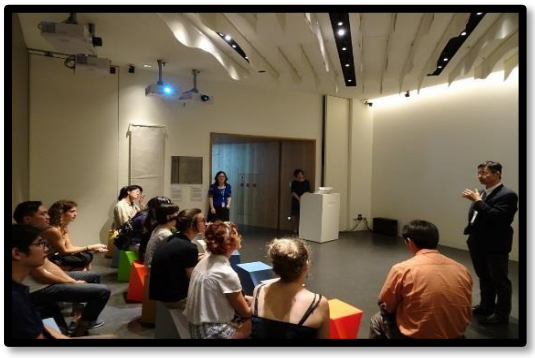
Date: Jun. 22, 2018

Venue: Industrial Technology Research Institute- Biomedical Technology and Device Research Laboratories

Purpose: Seeking the opportunity of internship

Introduction: Industrial Technology Research Institute(ITRI), founded in 1973, is one of the leading technology R&D institutions in the world. It aims to innovate a better future for society. ITRI has played a important role in transforming Taiwan's industries from labor-intensive into innovation-driven. It focuses on the fields of Smart Living, Quality Health, and Sustainable Environment.

With the increase of patients suffer from chronic illness and civilized illness, the field of preventive medicine is getting important. Prospective biological medicine and innovative medical devices are the important field of development in the future to each country. Recently, the value of output of biological medicine and innovative medical devices increases exponentially. It means these two industries are the industries we have to focus on. Fortunately, the students had the chance to visit Biomedical Technology and Device Research Laboratories of ITRI, realized the key point of medical devices development in Taiwan , as well as seeking the opportunity of internship.



Industry Visit – SGS Societe General de Surveillance

Date: Aug. 1, 2018

Venue: SGS

Purpose: Understanding the examine process of Taiwan food industry

Introduction: SGS is the world's leading inspection, verification, testing and certification company. They are recognized as the global benchmark for quality and integrity. With more than 95,000 employees, they operate a network of more than 2,400 offices and laboratories around the world.

Their core services can be divided into four categories:

Inspection: Their comprehensive range of world-leading inspection and verification services, such as checking the condition and weight of traded goods at transshipment, help companies to control quantity and quality, and meet all relevant regulatory requirements across different regions and markets

Testing: Their global network of testing facilities, staffed by knowledgeable and experienced personnel, enable company to reduce risks, shorten time to market and test the quality, safety and performance of your products against relevant health, safety and regulatory standards

Certification: They enable company to demonstrate that their products, processes, systems or services are compliant with either national or international standards and regulations or customer defined standards, through certification

Verification: They ensure that products and services comply with global standards and local regulations. Combining global coverage with local knowledge, unrivalled experience and expertise in virtually every industry, SGS covers the entire supply chain from raw materials to final consumption.

The director of GIP-TRIAD, Prof. Tsai-Kun Li, and the representative student, Andy Wang, visited SGS company. With the detailed introduction by the manager Mr. Li, they learned more about the standard of food examination, the management of productive process and transportation.

NTU Pass-the-Baton Event

Date: Jun. 29, 2018

Venue: NTU College of Medicine

Purpose: Giving farewell to GIP students for leaving Taiwan to France

It is the first time for our university to establish a international master program, Global Innovation Joint-degree Program (NTU GIP-TRIAD) which is abbreviated to GIP, across three universities in different countries. This novel program is the cooperation between National Taiwan University, University of Tsukuba from Japan and University of Bordeaux from France. This university-level master program is cooperated with college of medicine, college of public health, college of bio-resources & agriculture, college of life science, school of dentistry and center for biotechnology. With education, innovation, characteristics of three universities from three countries and relayed cultivation, our aim is creating a University Entrepreneur Ecosystem which is suitable for entrepreneurship. Besides, we cultivate leaders to solve the problems of social unmet needs in our country and worldwide energetically, especially for urgent problems, such as food production and safety, public health protection and disease prevention and treatment.

The application of GIP started from February in 2017. Students needed to pass the entrance examination and evaluation of ability by GLidD system. After enrollment on September, these 13 students from Taiwan, Japan and France, took classes and planned internship in Tsukuba University in Japan in the first semester. After making study plan and course model suggestions given by GLidD system assistant, the students went to National Taiwan University. The students selected module classes, took courses, did research in related laboratories, had internships in cooperated companies and finished the preliminary plan and data of related issue according to their aspirations, interests and willingness. In the third semester, the students moved to France, selecting module classes, taking courses, doing research in related laboratories, and being interns in cooperated companies. In the final semester, by following self-planning and evaluation of ability and aspiration by GLidD system assistant, student can go to the country, school and company which is suitable for them, getting graduated credits and finishing the research and internship. Finally, they will go back to their original school, complete degree examination and graduate.

In the time of middle summer, GIP students finish their curriculum, internship and research in National Taiwan University completely, and they would go on their curriculum of third semester in France. Thus, we held a GIP-TRIAD farewell party for them on 29th June, 2018, greeting assistance of the school. Besides giving talk by Tei-Wei Kuo, the president of NTU, Shu-Ying Chang, Vice President for International Affairs, and Shan-Chwen Chang, the dean of NTUCM, professor Ryosuke Ohniwa. Simultaneously, the GIP director, Prof. Tsai-Kun Lee, GIP delegator in University of Tsukuba, Prof. Masao Ichikawa and the GIP director in University of Bordeaux, Dominique Rolin, joined this activity by Skype as well.

With the instruction and advice by GIP office, the second GIP students held this activity. It revealed that the creative spirit and the first GIP students' success of GIP-TRIAD program. At the highest point of the process, the NTU president gave first GIP students a baton, symbolizing the inherited spirit of GIP-TRIAD program, and wished they would be successful in studying in France. The director and professors of GIP program also gave students wish and expectation through Skype. After the activity, the professors and students had lunch together, exchanging their opinion and thoughts, giving some instructions, advices and help to GIP program.

Nowadays, with rapid change and expectation, and facing the challenges, it is necessary to create some new idea, and cultivate the talent with specific view and experience. Thus we can search suitable methods to solve the problems in the world. We expect this trans-boarder GIP-TRIAD program, cooperating with National Taiwan University, University of Tsukuba and University of Bordeaux, can introduce the concept of Campus-in-Campus, creating a worldwide learning environment, and helping our students make sufficient preparation for the international challenges. In that case, we can create the innovated ideas, exchange the different cultures and advantages, to deal with the unmet needs and problems in our country and the world.

Student Activities

Current Research Activity Reports

Student Name	Home University	Professor at NTU
Chen-Pang Wang (Andy)	National Taiwan University	Prof. Han-Yi Chou

Comprehensive Report Title (Tentative) : Meta-analysis of functional molecules toward designing the tool for social acceptance of functional food.

Study Topic in NTU : Mass production feasibility and social acceptance of in vitro meat in Taiwan, Japan and France

Current activity at NTU :

1. General meeting with professor for studying the cultivation of in vitro meat via living livestock muscle cells stem cells harvest and subject contents modification
2. Scientific Journal survey of current development of culture meat technology with stems cells
3. Comprehensive report framework construction

My intended research in NTU is on the mass production feasibility and social acceptance of in vitro meat in Japan, Taiwan and France. Through the in vitro cultivation of animal muscle and soft tissue stem cells, there will be less land destroyed by the dairy industries and less greenhouse gas emission. Third semester in France, I will conduct the mass production feasibility and social acceptance of in vitro meat in the French society. I aim to study the current measurements on coping with the climate change with the new way of meat supply method. In order to cope with the obstacles on cultured meat, the efficiency of in vitro meat production system (IMPS) on cultivated the muscle cells in liquid medium on large scale.

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Supervisors in UT : Prof. Ryosuke Ohniwa

Expected Supervisors in UB : Prof. Michel Hernould, Prof. Catherine Bennetau*

* Interested but undecided

Student Name	Home University	Professor at NTU
Hsin-Yun Wang (Cindy)	National Taiwan University	Prof. Wei J. Chen

Comprehensive Report Title (Tentative) : Influence of dietary supplement and exercise on muscle mass and physical performance among elderly people with sarcopenia.

Study Topic in NTU : A literature review on the relations of exercise and nutrition to sarcopenia

Current activity at NTU :

I have conducted a literature review on the relations of exercise and nutrition to sarcopenia during this semester with my advisor. The results of the review are summarized in the following two paragraphs :

"The number of the elderly in Taiwan has been rapidly increasing. Currently, the proportion of people aged 65 and older in Taiwan is about 14% and this proportion will become 20% in 2026 in the prediction [1]. The population aging forces us to pay attention to sarcopenia. Sarcopenia has been defined as the loss of skeletal muscle and physical function including muscle strength or physical performance that occurs with aging by European Working Group on Sarcopenia in Older People (EWGSOP) [2]. According to the diagnostic criteria developed by EWGSOP, a group of researchers combined five cohort studies and determined the prevalence of sarcopenia in Taiwan was around 3.9 to 7.3% among the elderly population using different cut-off points [3]. Sarcopenia is a clinical condition associated with greater risk of physical disabilities, falls and mortality [4-8]. Either physical disabilities or falls will increase the healthcare expenditures and one study calculated the direct cost of sarcopenia in the United States in 2000 was around 1.5% of total healthcare expenditures [9]."

"In healthy older adults, physical exercise has been indicated a positive effect on muscle mass and physical performance (gait speed, chair rising test, balance, etc.) [10]. Many studies have also shown that resistance exercise could improve muscle strength in the elderly population [11]. In addition, the previous studies have shown that the combination of creatine supplementation with resistance training on the healthy elderly improved muscle mass, muscle strength and some of physical performance, suggesting it as a possible treatment to sarcopenia [12, 13]. However most of the previous studies focused on healthy older adults, there are few randomized controlled trials (RCTs) on the effect of exercise and creatine among sarcopenia population."

On the basis of this literature review, I have prepared a tentative topic for my comprehensive report with the title "Influence of dietary supplement and exercise on muscle mass and physical performance among elderly people with sarcopenia." With the help of Prof. Chen, I will meet with the superintendent and his team at the Bei-hu Branch, National Taiwan University Hospital, which is located in an aging community in Taipei city. During the meeting to be held on July 5, I will present my research idea and seek any opportunity to work with the team over there on research on the effect of nutrition supplementation and exercise on sarcopenia among elderly people.

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Supervisors in UT: Prof. Masao Ichikawa .

Expected Supervisors in UB : Prof.Catherine Bennetau*

* Interested but undecided

Student Name	Home University	Professor at NTU
Li-Yun Lin (Jamie)	National Taiwan University	Prof. Suming Chen

Comprehensive Report Title (Tentative) : Comparison and Evaluation of Anthocyanin Contents in Grapes of Different Varieties (in Taiwan, Japan and France) Using NIR Spectroscopy

Study Topic in NTU : Comparison and Evaluation of Anthocyanin Contents in Grapes of Different Varieties (in Taiwan, Japan and France) Using NIR Spectroscopy

Current activity at NTU :

My research area contains agriculture, engineering, medicine, life science and management, and the research topic is "Comparison and Evaluation of Anthocyanin Contents in Grapes of Different Varieties (in Taiwan, Japan and France) using NIR Spectroscopy. I worked on NIR spectrum to detect anthocyanin, an important chemical of anti-oxidant, and the quality of red wine, grape and grape juice in Japan. Researching and improving the non-invasive method to exam grapes, the raw material of wine and important agricultural product of the three countries, and detect the content of anthocyanin, and hope a new quality control standard can be built based on the improved non-invasive method. Combining the research of medical value of the anthocyanin, a new marking strategy may be developed from it. This program provides a diverse study opportunity for students, which will allow me bringing this interdisciplinary research from the laboratory to the industry. From that, I can continuously optimize my study, and rewards the industry and market back, which will lead to a good combination of research and business.

- Measure the Anthocyanin in grapes.
- Analysis data
- Personal meeting
- Lab seminar
- Paper reading

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Supervisors in UT: Prof. Osamu Ohneda, Takuma Genkawa

Expected Supervisors in UB : Dominique Rolin, Tristan Richard, Stephanie Krisa*

* Interested but undecided

Student Name	Home University	Professor at NTU
Meng-Ting Yu (Arissa)	National Taiwan University	Prof. Chang-chuan. Chan Prof. Tzu-Hsuen Yuan

Comprehensive Report Title (Tentative) : Risk assessment of neonicotinoids residue in teas from Taiwan and Japan

Study Topic in NTU : Risk assessment of neonicotinoids residue in teas from Taiwan

Current activity at NTU :

1. Regular meeting is held on 15:30 to Tuesdays.
2. Group discussion with Prof. Tzu-Hsuen Yuan, GIP-TRAID student Mamiko Mizuno and NTU master student Maggie Yen.
3. 25th of June: group discussion with Prof. Shoji Nakayama from NIES for the internship of the fourth semester.
4. Content:
   - Background leading to the idea
     Tea is the second larger beverage in the world, as the tea marketing gradually grows and the large population drink tea every day, the risk of drinking tea is needed evaluation. Neonicotinoids pesticide is one of the majorities from farm chemicals, which is also well known for harming environment and insects. Thus, some studies indicated the risk of pesticide residue in the food. This research will collect the samples from locals and compare with maximum residue levels(MRLs), to identify the threats of overuse of the neonicotinoids in the tea farming and the pesticide residue issues..
   - Specific aims concluded from the preceding contents
     This research is aim to understand the neonicotinoid residue level from tea in Japan, Taiwan. It will also provide the exact data of pesticides residue for consumers, industries, and government. Risk assessment of neonicotinoids will lead the public to understand food safety from the tea. Furthermore, the potential risk of neonicotinoid can be identified, which can help the experts to prevent further damage to the environment and human health. Also, the government can modify policy in agriculture and public health base on this research.
   - Note: The Original tentative title is “Risk assessment of neonicotinoids residue in teas from Taiwan, Japan, and France,” due to the time limitation and the difficulty finding local tea in France, after group discussion, unfortunately, I have to exclude the tea in France at the moment. However, Europe is the first action on the issue of neonicotinoids residue in food and environment; therefore, the policy regulation in France will be the target learning aim in the third semester.

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Supervisors in UT: Prof. Yoshito kumagai /(NIES) Nakayama Shoji

Expected Supervisors in UB : Prof.Catherine Bennetau

Student Name	Home University	Professor at NTU
Szu-Chun Yang (Julie)	National Taiwan University	Prof. Tsai-Kun Li

Comprehensive Report Title (Tentative) : Characterization of microbiome phenotypes to enhance precision medicine.

Study Topic in NTU : QIIME and the implementation

Current activity at NTU :

1. Learning QIIME 1 and 2, next-generation microbiome bioinformatics platforms.
2. Extracting DNA and preparing samples for IVF experiment.
3. Assisting ITRI for application of Traditional PMA.
4. Expand QIIME for Precision Medicine.

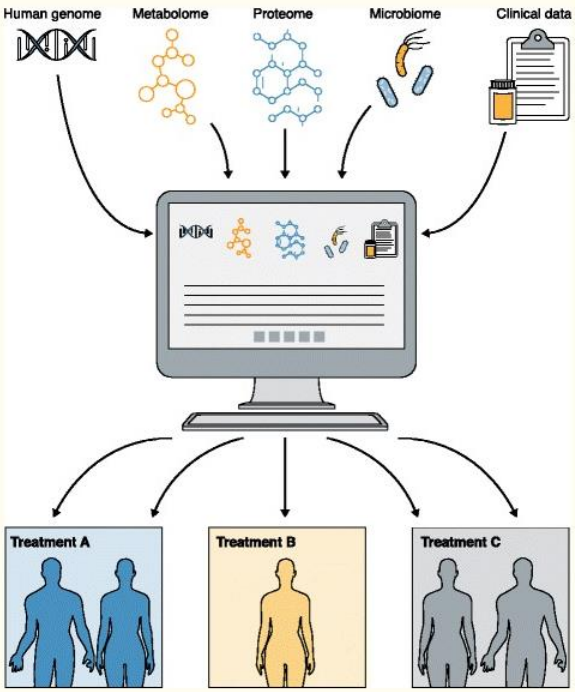

Fig. 1

Clinical data are combined with 'omics' data sets, including microbiome analyses, in precision medicine strategies to identify personalized treatment options for individuals presenting with a given disease

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Supervisors in UT : Prof. Takahashi Satoru

Expected Supervisors in UB : Prof. Thierry NOEL*

* Interested but undecided

Student Name	Home University	Professor at NTU
Emilie GERICOT	University of Bordeaux	Prof. Ning-Sing Shaw

Comprehensive Report Title (Tentative) : Nutritional benefits of micro-algae and their use for dietary supplements

Study Topic in NTU : Analysis of triglycerides in fish oil samples using the coupled system HPLC/MS (high performance liquid chromatography/ mass spectrometry)

Current activity at NTU :

I spent my 2nd semester in NTU working in the lab of Professor Shaw. My current interest was to work on microalgae and analyze their nutritional and beneficial potential. However, there weren't any labs in NTU working on microalgae and the procurement of these microorganisms was difficult as they are often protected by patents. After having read many scientific articles and having shared many discussions with Professor Shaw, we decided to launch a project on fish oil analysis. Indeed, concerning the nutritional benefits, I realized that omega-3 (polyunsatured fatty acids) are produced in high amount by microalgae and are important fatty acids for human as they are required for the foetal development, for the brain, the eyes… and other biological functions in the body. Although algae are the primary sources of omega-3, fishes also contain some as they eat algae. Then, we could get some fish oil samples from the market and performed the analysis of their fatty acids content. The aim of the project was to learn the methods and the technic of oil analysis in order to be able to apply it for microalgae oil extract in the future.

Before starting the lab work, I learnt how to design an experiment by taking in account all the different steps needed for this analysis. I also managed to do a delta sheet recording all the relevant information on the fish oil packing such as their nutritional composition, their price, etc… These backgrounds information were required to know the product better, to anticipate the results and interpret them.

Product ID	Product Name	Percentage of omega-3 in one capsule (%)	Total Amount of omega-3 (mg)	DHA (mg)	EPA (mg)	Calories (kcal)	Proteins (g)	Lipids (g)	Satured Fatty Acid (g)	Unsattured Fatty Acids (g)	Carbohydrates (g)	Sugar (g)	Sodium (mg)
NTUDHA07	Ocean energy fish oil	32,4	150	150		3,29	0,12	0,29	0,02	0	0,05		0,38
NTUDHA02	Omega-3 enriched formula	31,25	500	200	300	12	0,3	1,2	0,1	0	0,1	0	0
NTUDHA05	DHA fish oil	30,69	620	510	110	14,7	0,48	1,37			0,11	0,005	60
NTUDHA06		30	180	150	30	4,1	0,1	0,4	0	0	0,03	0	0
NTUDHA01	Omega-3 fish oil 1000	21,49	300	120	180	10,4	0,3	1	0,2	0	0,1	0	0,2
NTUDHA03	Fish oil 1000	21,43	300	120	180	10,4	0,3	1	0,3	0	0,1	0	0
NTUDHA04	Choice fish oil	17,5	420	420 +/- 60		17,1	0,6	1,5	0,4	0	0,3	0	2

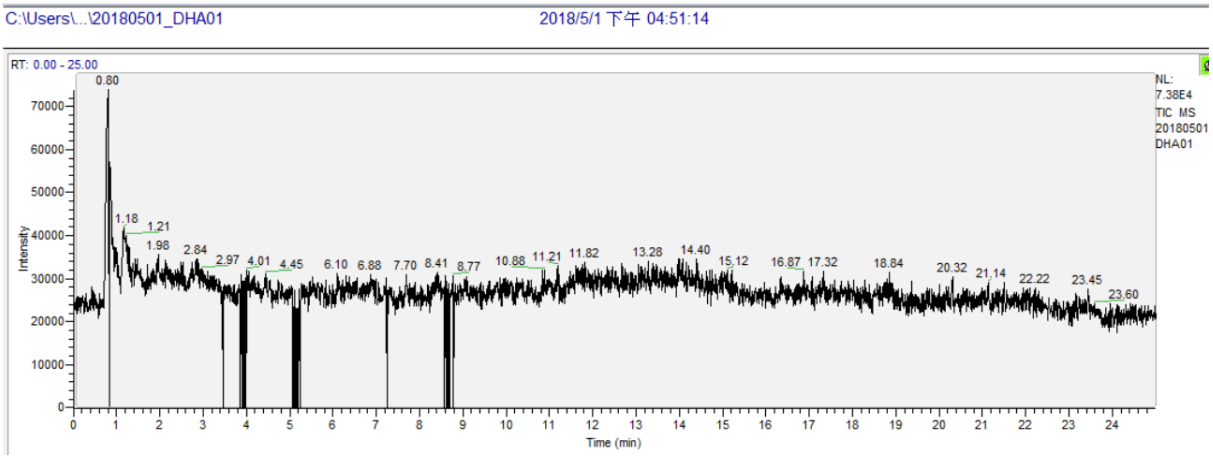
Delta Sheet of the Fish Oil Products

I used the instrument HPLC (high performance liquid chromatography) associated with the MS (mass spectrometry). This technic was the best to use to analyze the nature of the fatty acids contained in oil and their position in a lipid such as triglycerides. I spent many afternoons in the lab learning how to process the device, how to set the parameters and the conditions, how to prepare the instrument before every utilizations… When I felt ready to use it, I prepared the 7 fish oils samples for the analysis and diluted them with IPA (because IPA was also the solvent used during the chromatography analysis). The choice of the dilution factor was an important step of the experiment

and had to fit with the limit of detection and the limit of quantification of triglycerides. Then, we transferred the diluted samples in vials destined for HPLC/MS analysis.

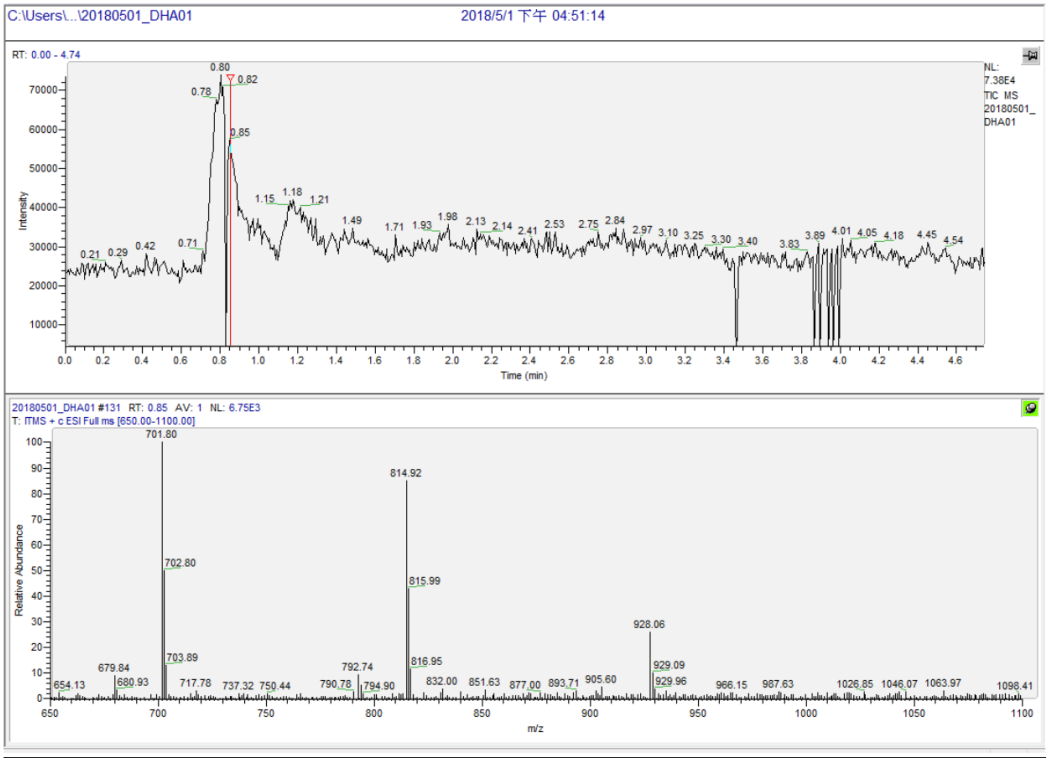
3 of the 7 fish oil samples (NTUDHA01 / NTUDHA02/ NTUDHA03)

To set the parameters for the fish oil experiment, we used the same conditions used in previous experiments performed on plant oil samples that allowed to obtain very good data (good distribution of the peaks in the chromatogram, clear, with a good intensity…). According to them, we put ammonium acetate in methanol in the left pump and ACN and IPA in the right pump. However, after having collected the first data, the results obtained with these parameters were not relevant enough. Indeed, as you can see on the graph below, the first peak appeared very fast which mean that the retention time was too short and the elution too fast. Then, some modifications have been brought to improve the separation and the lecture of the results.



Chromatogram obtained with the parameters set according to plant oil analysis

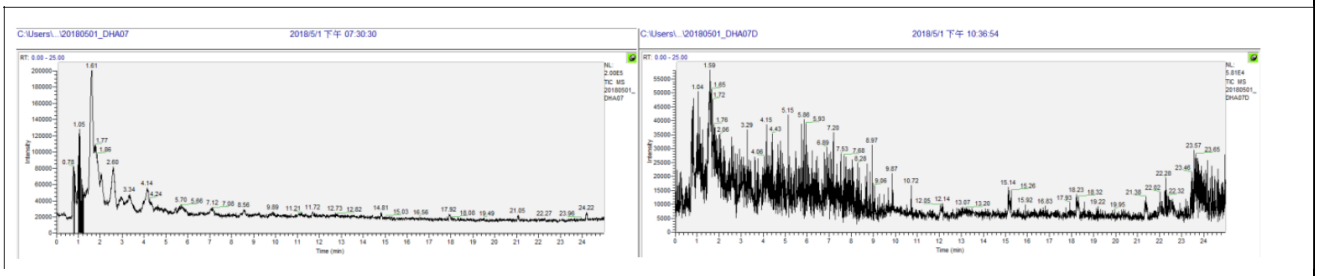
We renewed the experiments several times as for one round, we ran out of nitrogen gas, so the results were biased. It was interesting to experience a failure during my experiment. The fact that we could identify the source was also beneficial as it allowed to show how nitrogen is relevant for HPLC/MS analysis.



Chromatogram obtained without nitrogen outage VS chromatogram (duplicate) obtained with nitrogen outage

By the end of the experiment, for each sample, I obtained a chromatogram coming from the analysis of the samples in the liquid chromatography part and each peaks of this chromatogram corresponded to a particular mass spectrum obtained by the mass spectrometry part. The software "Thermo Xcalibur" was used to analyze the spectrum and the chromatogram.

Correlation between chromatogram and mass spectrum



The spectrums were really difficult to analyze as they gathered a lot of peaks. However, I could learn how to read it by understanding the fragmentation of the triglycerides after the ionization in the mass spectrometry part. To make the analysis easier, I exported all the data of the chromatogram and the mass spectrum in an excel table. Then, I identified the high intensity values in the chromatogram, corresponding to compounds present in large amount in the fish oil extract, I checked the associated retention time, and I found in the spectrum the mass corresponding to this time. The final goal is then to identify the molecules corresponding to each mass in the spectrum. To do that, we needed to have some guidelines providing information on the molecular weight of the triglycerides, the fatty acids,

the diglycerides…

However, as this method applied for TG analysis in fish oil is new, further research has to be run to have more accurate data and be able to identify them.

Conclusion :

The research topic I studied this semester was beneficial for me. I have learnt some technic to set the conditions regarding previous experiments and I realized that according to the material analyzed the conditions must be modified to improve the system and allow good interpretations.

According to the fact I am going to do an internship in July in a company that extracts oil (omega-3) from micro-algae, I am even more delighted to have followed this lab work during this semester. I could learn how to handle a fancy instrument (HPLC/MS) and understanding the difficulties undergone during a scientific project. Even if my first interest is not the lab work, I realized that it is very useful to understand how to use lab appliances as it allows to better control and target the product you want to analyze or obtain.

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Supervisors in UT : Prof. Ryosuke Ohniwa

Expected Supervisors in UB : Prof. Jean Michel Mérillon, Prof. Catherine Bennetau

Student Name	Home University	Professor at NTU
JOLIVET Marie-Dominique	University of Bordeaux	Prof. Shih S. Lin

Comprehensive Report Title (Tentative) : Geminiviruses infection of Cassava, a food security crop

Study Topic in NTU : Autophagy mechanisms upon TuMV infection in A. thaliana

Current activity at NTU :

- **Observation** that led to this subject: Plants with mutant autophagy proteins (atg) that are infected by the Turnip Mosaic Virus (TuMV) showed an early senescence
- Infection of A. thaliana with TuMV:
  - Wild-type (Col-1) + 4 autophagy mutants (*atg5, atg8a, atg10 and nbr1*)
  - Infection with WT TuMV or mutated TuMV
  - Negative control: no infection
- **Qualitative** and **Quantitative** analysis of the plants
  - Fluorescence (TuMV coupled with GFP)
  - ELISA
- **Results**: autophagy mutant plants showed early senescence symptoms and were more infected than the wild-type
- **Hypothesis**: TuMV infection is a stress for the plant cell, leading to Programmed Cell Death (PCD). However, in WT plants, autophagy counterbalances this response and maintain the health status of the cell. Bulk autophagy may be even enhanced by the virus. In autophagy mutants, autophagy cannot cope with PCD, leading to early senescence.

See report for more details

References

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Supervisors in UT : Prof. Chiaki Matsukura

Expected Supervisors in UB : Prof. Valérie Schurdi-Levraud

Student Name	Home University	Professor at NTU
Kimberley MASSEI	University of Bordeaux	Prof. Tsai-Kun Li

Comprehensive Report Title (Tentative) : Functional metabolites contained in plants and mushrooms, and their use for health improvement

Study Topic in NTU : Functional metabolites contained in mushrooms, and their use for health improvement

Current activity at NTU :

My big project this semester was focused on cryptochromes regulation and photomorphogenesis induction. I carried out this research project because I really wanted to join this lab in plant biology and they needed someone to carry out this project, and I did it because I'm also interested in research field. My subject was to observe the effect of MeJA on CRY1 localization in Col-0, under blue light conditions. I did a small paper to present my results, that will be used as supplementary data for the paper the lab published in March 2018, and other papers to continue researches in this field. I needed to design a plasmid first, in order to put a marker (GFP) to see fluorescence of my plant epidermis cells. I did plasmid extraction first, then, I did digestion and ligation before to transform a strain of E.Coli with the desired obtained plasmid. I used colony PCR technique to select bacteria with the targeted plasmid, and then, I performed protoplast isolation and transformation. Lastly, I checked RY1 localization by fluorescence observation. My advisor for this project was : Prof. Hsu-Liang Hsieh

I begin to extract polysaccharides from Cordyceps sp. in TK Li laboratory, and, because I was working also on Cordyceps sp. in T-L Shen lab, I continue to work on this project. We performed one complete project studying Cordyceps sp., a mushroom used in Traditionnal Chinese Medicine. Because I am really interested in bioactive compound that can be used for our health, I chose to focus on the benefits of this mushroom, and with Valentin, we worked on Cordyceps sp. use and diversity. I performed polysaccharides extraction and in another lab, we did single spore isolation, mycelium growth, mycelium extraction, HPLC to analyse targeted compounds (cordycepin for cancer research and adenosine for dietary supplements use). Then, after we got DNA extract of the mushroom, we ran a PCR to amplify it, a electrophoresis and we give it to sequencing. We also evaluate antioxidant activity of cordyceps sp. extract with DPPH test and cell viability with MTT assay. About my researches, I also decided to study by my own energetic activity and immune-modulating activity of Ophiocordyceps sinensis and Ganoderma lucidum. My advisor for this project was : Prof. Tsai Kun Li.

Please, find attached my reports for a better understanding of what I did in laboratories.

PS : In another lab, I did many MTT assay and luciferase assay in a cell-based platform to evaluate the antioxidant and antiinflammation capability of different plant extracts, i.e. Japanese strawberry. I had the chance to join a lab to continue my project about phenolic activity of bioactive compounds found in berries and the link with our health. It was only to develop my skills.

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Cordyceps sp.

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Cell-based platform for antioxidant and anti-inflammatory activity

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Cryptochrome1 localization with or without MeJA treatment, under Blue light conditions.

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12. + 14 OTHERS : Please consult my report

Supervisors in UT : Prof. Yoshihiro Okabe

Expected Supervisors in UB : Prof. P.Gallusci

Student Name	Home University	Professor at NTU
Romain GARRIGUES	University of Bordeaux	Prof. Chau-Ti Ting

Comprehensive Report Title (Tentative) : Impact of the gene CG8630 in the Pheromone CH503 in Drosophila melanogaster

Study Topic in NTU : Genetic et genome modification

Current activity at NTU :

- Dissection
- Observation under microscope & binocular loop
- Reading Club
- Poster design
- CRISPR Studies and elaboration of methodology
- Selection of gRNA for CRISPR
- Reading articles
- Researches
- Transfer of drosophila
- Selection/ identification of mutant
- Identification of new mutant(s)
- Courses about fly genetic and drosophila morphology

I worked on a gene which can be linked to the maturation of a pheromone in drosophila melanogaster (male). I used the tool of cloning and CRISPR Cas 9 (elaboration of protocol and method) which can be used in plant models. I designed the gRNA to my target gene (induce a mutation). I used a sequence with a Restriction site (which can be recognize by a restriction enzyme). If I have mutation I will have a specific phenotype to do the selection. I do a PCR and If I have mutation I will not have cut. These tools and experiences will be useful for my expected job and studies.

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Male Pheromone (3-Acetoxy-11,19-Octacosadien-1-Ol) of the Drosophila Melanogaster Fruit Fly', Bioscience, Biotechnology, and Biochemistry 77, no. 9 (2013): 1931‑38, https://doi.org/10.1271/bbb.130383.

Supervisors in UT : Prof. Masao Ichikawa.

Expected Supervisors in UB : Prof. HERNOULD.

Student Name	Home University	Professor at NTU
Leannec-Rialland Valentin	University of Bordeaux	Prof. Tsai-Kun Li

Comprehensive Report Title (Tentative) : Creating Food supplement using fungi based on some interesting chemical substances

Study Topic in NTU : Practical studies in lab on fungi and beneficial bacterias

Current activity at NTU :

- Isolation, identification and comparison of beneficial bacteria in Taiwanese food products
- Identification of fungi (morphologic and genetic)
- Evaluation of Cordyceps extract on Cancer cells
- Visits of IMEI Company (food product and food supplements), Grape King company (healthy food product and food supplements based on fermentation), Mucho cordyceps (food products and foods supplements based on cordyceps), Biotechnology and Pharmaceutical Industries Promotion Office and Industrial Technology Research Institute (ITRI)
- Visit of Xitou experimental forest, collect of fungi

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2. Yen-Wen Wang, Tzu-Wen Hong, Yu-Ling Tai, et al., "Evaluation of an Epitypified Ophiocordyceps formosana(Cordyceps s.l.) for Its Pharmacological Potential," Evidence-Based Complementary and Alternative Medicine, vol. 2015, Article ID 189891, 13 pages, 2015. https://doi.org/10.1155/2015/189891.

Supervisors in UT: Prof. Abe Junichi

Expected Supervisors in UB : Prof. Barroso Gérard*

* Interested but undecided (5/30) - sample

Student Name	Home University	Professor at NTU
Minagi Uchida	University of Tsukuba	Prof. Ning-Sing Shaw

Comprehensive Report Title (Tentative) : Creating Human Body Journey Map of Functional Molecules

Study Topic in NTU : Learning nutrition education

Current activity at NTU :

1. Attend seminar every Monday morning. Share and discuss the progress with professor and other students.
2. Attend two lectures related to nutrition. One is about relationship between health and vegetable, fruits. The other one is about sports and nutrition
3. Write report about lectures related to nutrition.

References

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2. Ministry of Agriculture, Forestry and Fisheries. Shokuiku Promotion Policies: FY2015
3. Ministry of Health, Labour and Welfare. The National Health and Nutrition Survey in Japan, 2016.

Supervisors in UT : Prof. Ryosuke Ohniwa

Expected Supervisors in UB : Prof.Catherine Bennetau

Student Name	Home University	Professor at NTU
Mizuno Mamiko	University of Tsukuba	Prof. Chang-Chuan Chan

Comprehensive Report Title (Tentative) : Sugar sweetened beverage intake among school children

Study Topic in NTU : Sugar sweetened beverage intake among school children

Current activity at NTU :

I focused on obesity among children and I learned how to make questionnaire and conduct the questionnaire research in Taiwan.

In these days, the consumption of SSB is increasing in the US and most westernized populations. It has been said that a greater consumption of SSB is associated with childhood obesity. Now, there is increasing interest in the situation of SSB consumption among children in their school and school policy to reduce SSB consumption. However, these are different in each countries so the questionnaire is about sugar-sweetened beverage (SSB) intake among school kids and school regulation in Taiwan and Japan.

I researched the prevalence of child obesity and school regulation in Japan, Taiwan and France because school environment and regulation may be one of prevention against child obesity. I had the meeting with professor once a week and wrote my report, proposal and questionnaire.

References

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2. Child Eating Behavior Questionnaire (CEBQ)
3. Relationship between Sugar Intake and Obesity among School-Age Children in Kaohsiung, Taiwan. Lin PY, Lin FY, Chen TC, Chen WL, Doong JY, Shikanai S, Sarukura N, Yamamoto S. J Nutr Sci Vitaminol Tokyo 2016.
4. 全国体力•運動能力•運動習慣調査（平成 25 年度小学生）文部科学省

Supervisors in UT : Prof. Masao Ichikawa

Expected Supervisors in UB : Prof. Catherine Bennetau

Student Name	Home University	Professor at NTU
Nobuyuki Akami	University of Tsukuba	Prof. Ning-Sing Shaw

Comprehensive Report Title (Tentative) : Text analysis of evaluation of Japanese food by newspapers*

Study Topic in NTU : Association between education of food and social situation

Current activity at NTU :

1. I joined the meeting with Prof. Shaw, Prof. Ohniwa and my classmates every Monday morning
2. Prof. gave us some lectures about how to think and construct of experiment research
3. We discussed the situation of education of food in Taiwan, especially for children.Moreover, we shared the situation in each country, such as France and Japan.
4. I did presentation and wrote report about association between nutritional situation and medical expenditure.

References

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2. Y-T. Lo et al., 2016, "Elderly Taiwanese who spend more on fruits and vegetables and less on animal derived foods use less medical services and incur lower medical costs", British Journal of Nutrition, 115, p.823-833
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7. T. Saitou et al., 2012, "Medical care costs and the characteristics of higher medical costs among BMI groups in the early-stage elderly analysis of data obtained from a large-scale study of 29,490 elderly", 日本公衆衛生誌 (Nihon-koshueisei-shi), Vol.59, No.7, p.466-473

Supervisors in UT : Prof. Ryosuke Ohniwa

Expected Supervisors in UB : Prof. Alain Decendit*

* Interested but undecided

Research Activities

Research Activities

< Learning in NTU and Suggestion About the Internship >

Student Name : Chen-Pang Wang

Home University : National Taiwan University

The semester in NTU was really intense. The GIP students had been taught in not only the basic scientific knowledge but also the interdisciplinary study. In Bio-entrepreneurship Training, I learned the speakers can learn.

In Fusion of Field and Laboratory Studies, I learned the real application of my subject in real life. In Food Safety & Health, I learned the risk assessment and all important risks on food safety. In Agriculture of Taiwan, I learned the current innovative researches of NTU researchers in bio-agricultural field. In Contemporary Issues in Global Health, I learned the issue of current public health issues. In Cellular Network of Biological Molecules, I had a chance to give a journal review with group of GIP students on potential new drug development about Myocardial infarction.

However, about the Internship, I would like to suggest an idea for future GIP students to find their internship more easily. I would like to propose that GIP-TRIAD to transform into the liaison platform in between professors, students and the industries. The vision of GIP-TRIAD program is to cultivate the future leader in the field of food and health. Therefore, the connection with the industry is crucial to the students in their future career. According to the special position of GIP-TRIAD program, the program should be serviced as the bridge that connect the academy and industries in three different countries. In USA, many universities have set up the special office to connect the industry and the school. The aim of those offices are to help the industries to cooperate with the universities on the application of innovative school researches into the real world. The famous one will be the Industrial Liaison Program (ILP) in Massachusetts institute of Technology (MIT). The ILP was established in 1948. The program has connected with over 200 of the world's leading companies with the MIT. The cooperation ensures the member companies to cooperate with professors from MIT to help the industry overcome the current obstacles by the research. The professors from the MIT can get the sponsorship from the companies or even form the cooperation program to discover new technology. From the successful case in MIT, the GIP-TRIAD program can learn from the case and service as the future liaison program between the professors involved in the program and the companies. The GIP students can benefit from the cooperation and can enter the companies to have internship on their research topics.

< Impressing Parts in GIP-TRIAD Courses in NTU >

Student Name : Hsin-Yun Wang

Home University : National Taiwan University

I took the following courses in NTU: agriculture of Taiwan, cellular network of biological molecules, contemporary issues in global health, measuring burden of disease: methods and applications, principle and application in health research methods and so on. I would focus on some of them in this report. Briefly, those courses are conducted in English and all of these courses have at least one student who is not from GIP program. I personally prefer this condition that we could interact and discuss with other students, not from GIP.

As a GIP student, cellular network of biological molecules is a required subject. It is a long distance learning course that professors and students from Kyoto University and University of Tsukuba attend the class together by using online video. We could ask questions to Japan students and also get the feedback or questions from them. Besides, each graduate student in this course is required to attend the group presentation of the assigned paper by the course instructors. During the group presentation, we needed to communicate with other students from various background. Although the assigned paper might be in the field which we were not familiar with, we tried our best to understand this scientific paper as a graduate student.

The second course I would mention is principle and application in health research methods. It is a class within ten students and it helped students exchange idea smoothly. The aim of this course is to introduce concepts of study design, data collection and statistical analysis commonly used in public health research with a strong focus on global health. I learned a lot of useful knowledge from this course and it may help me complete my comprehensive report in the future. For the final presentation in this course, each student is required to do a 15-minutes presentation on our research proposal for the identified topic. I could generalize my own idea during preparing for my final presentation.

The final part is about lab meeting in the professor Chen's lab. During my stay in Japan, I didn't attend the lab meeting because of the course time overlapping. I participated in the lab meeting every week this semester. I have heard a lot of presentation from other master and doctoral students and also heard the comments from the professor and other students. I sometimes learned from these comments even I'm not studying this field.

NTU is my host university and also I graduated from here one year ago. I'm familiar with NTU and help me in the steps quickly. I'm glad to help my international classmates and have chances to interact with international students at my host university.

< Dinner with Ohniwa Sensei and All GIP-TRIAD Students >

Student Name : Li-Yun Lin

Home University : National Taiwan University

In February 26, 2018, all GIP-TRIAD students started their second semester in National Taiwan University. Due to the busy schedule, it's extremely hard for all of us to find some time to having meals and chat with each other. In June 18, 2018, all GIP-TRIAD students had dinner with Professor. Ohniwa. We shared our feedback of this program and discussed our plan for the coming semester in University of Bordeaux.

GIP-TRIAD students, at least the first generation, constantly help each other to go through difficulties and comfort each other at times. I think that is the key factor why this program can keep working and promoting. Hope everyone will have good experience in the future semesters and graduate as soon as possible.

< Industry Visiting : I-MEI Factory >

Student Name : Meng-Ting Yu

Home University : National Taiwan University

Courses : Food health and safety ; Location : I-MEI factory

I-MEI is a large and historical food industry in Taiwan, they try to improve food industry from traditional food company to the health food industry, including to provide customer healthier food products and also develop a different kind of food. From wedding cookies, snacks to oil and supplement food. I appreciate this kind of company make their business sustainable in Taiwan.

Employees in I-MEI

While we were visiting the I-MEI, I observed that they were also welcoming different background people and different nationality workers to work together, create a friendly and international work environment, this would provoke different the creation and bring the secure connection between employees.

Monitoring system and quality control in I-MEI

I-MEI company monitors the food production in a transparent system and produce food according to standard processes, we also met some technicians were checking machine which shows the high standard. The next stop was visiting the Muffin produce in the production line, they use a camera to monitor and to educate employees following the standardize procedures.

The welcoming sign from I-MEI

GIP-TRAID enjoy I-MEI ice cream

The food safety incidents in Taiwan

Transparent producing process in I-MEI

< Class Experience of GIP-TRIAD in NTU >

Student Name : Szu-Chun Yang

Home University : National Taiwan University

During this semester in NTU, I've taken many interesting courses, including:

DNA Processing in Drugs, Diseases and Health

Thanks to prof. Li's arrangement, we got this great opportunity to have lectures from prof. Jean-Marc Egly. For beginner as I am, he translates those difficult terms and technologies into simple concepts for us to understand easier during four lectures. He doesn't only teach us DNA-repairing knowledge but also emphasizes the importance of being honest when conducting researches. Researchers should always remember that all studies they published will make a serious effect to other researchers. So if they manipulate data for better results and better positions, it will not only effect themselves but also for the whole academia, and probably would take decades to correct these mistakes.

Food Safety and Health

I've heard of prof Chiang for a long time because every time when food scandals happened in Taiwan, we'll see his appearance on the news with his professional opinions. I'm so surprising that even he's so occupied for the duty from NTUH, he still made a lot of effort on teaching. He recorded all lectures in English beforehand and put them online so we can get familiar with contents and had further communication during classes. I'm really interested in this course since all examples that professor gave are around our daily lives. By analyzing risks, we can protect our society and ourselves and prevent possible damage before it occurs.

Agriculture of Taiwan

This course conducted by many professors from the department of agriculture with variety of specialties which is so amazing that we get to learn all different interesting knowledge about Taiwan's agriculture. I'm grateful for the effort all professors made for Taiwan to become a better place. For me, learning all these knowledge of Taiwan is a perfect way to respect this land more and makes me want to do my best to create a better future for my hometown. Every time when I take this course, I can always feel their enthusiasm.

Contemporary Issues in Global Health

This course conducted by many professors from the department of public health. Each professor led us to tackle one major topic in public health. Writing essays monthly is a big challenge and also a good opportunity for me. I'm glad that I have chances to write my opinion as an article and to get feedbacks by professors. I found that professors from department of public health will encourage us to think and to look for reasons and solutions.

Measuring Burden of Disease: Methods and Applications

Thanks to this course, I learn how to evaluate each disease's burden and DALY. For global health purpose, to know the burden of diseases under different conditions can help governments to form suitable policy toward each problem. Prof. Lin told us

his own story of how he decided to change his career from clinical medicine into GBD. He inspired me that we should take every event account and it will lead us to another pathway that maybe more suitable for us.

Cellular Network of Biological Molecules

This is my first time participating long-term course among four institutes. It's a good opportunity to know the characteristic of each institute through the way they presented or the questions they asked. Tsukuba, Kyoto sites are always serious and on-time, their attitude impressed me from the first semester in Tsukuba University and still gives me a very good impression. Sometimes the content of this course is difficult for beginners like me, but still good to have this chance to learn all new knowledge.

< Study Experience in NTU in the Spring Semester 2018 >

Student Name : Emilie GERICOT

Home University : University of Bordeaux

I could experience the student life in Taiwan during the semester 2018 from February to July. The lecture I selected ranged from medical topic to agricultural ones. It included “Environmental and occupational health”, “Agriculture of Taiwan”, “Bio-entrepreneurship training”, “Contemporary issues in global health”, “Cellular network of biological molecules” and “Food safety and health”. The diversity of the lecture made the semester very interesting as we could receive a wide range of knowledge linked with food security and public health. The relevant aspect was that we were always taught many cases study associated with real facts and international global issues.

Some group works were organized like in Cellular Network, where we were asked to present an article during a 20min presentation in a team of 5 people and to design an experiment to answer an explained question we had in the paper studied.

During some lecture we could enjoy some visit tours and activities.

Agriculture of Taiwan

We visited the Phytotron of National Taiwan University that control genetic and environmental factors for the plant growth and development. It was very interesting as we could see various tools to improve the culture practices, and the crop productivity and quality. We also went to the “Rice Museum” in the Advanced Academy of Agronomy and Forestry where we could have an introduction on the history of the rice in Taiwan.

Applied Translational Microbiology

I also joined a field trip to Xitao experimental forest where we could visit a tea farm and where we could observe different fungi species in the environment.

Food Safety and Health

We were invited by I-Mei company, a major old Taiwanese company specialized in manufacturing, distributing, exporting, and importing food products. We could visit the lab used for the quality control and we also saw all the process of the food chain production.

Environmental and Occupational Health

We visited the Centers for Disease Control (CDC) in Taipei. It was really interesting, and we could understand the whole process of disease control from the collection of the samples to their analysis in laboratories. In this lecture, we also did an outside activity in the streets around the Public Health building in order to collect Aedes albopictus larvae in different water tank. It was an opportunity to see the tools that are implemented in a situation of an outbreak (dengue, Zika virus, chikungunya…).

Contemporary Issues in Global Health

We visited the lab of the Public Health Building where mosquito samples are

stored.

Bio-Entrepreneurship Training

We went to Epoch foundation whose mission is to facilitate Taiwan's industrial development by encouraging and helping start-up companies. As I am really interested in the business world, I liked this visit as I could see the step required to create a company.

Our teachers also organized a visit in an industry cultivating and producing Cordyceps, and we could have the opportunity to taste specialties containing Cordyceps. It was a good way to see the power and the benefits of the Chinese medicine.

This semester enables us to acquire a general knowledge based on real evidence which was very beneficial.

< Activity Report During NTU Semester >

Student Name : JOLIVET Marie-Dominique

Home University : University of Bordeaux

I took 15 credits during this semester. I attended the mandatory courses: Agriculture of Taiwan (2 hours/week), Contemporary Issues in Global Health (3 hours/week) and Cellular Network of Biological Molecules (2 hours/week). I took optional courses as well: Environmental and Occupational Health (3 hours/week), DNA Repair (15 hours in total), Research and Development and Food Safety and Health (2 hours/week).

Agriculture of Taiwan

We were attending many different courses hosted by different teachers. The subjects were very diverse, from economy to geology, but always related to Taiwanese agriculture. Most speakers were interesting and their presentations met my expectations. We also visited the phytotron and the NTU rice museum (details in "*Other Activity Report*"). We were scored on attendance and tests.

Contemporary Issues in Global Health

We attended courses each week on subject around global health: women's health, mental health, pollution, healthcare systems in the world… We had to do four reports linked with the courses. For example, one of my report was dealing with the lack of access to Healthcare for Roma people in Europe and another was about the Healthcare System in Burundi and its influence on the Health Status of the population. We also had to do a 20-minutes presentation. My subject was on the efficiency of screening methods for breast cancer diagnosis. We were told to do this presentation only 4 days before the dead-line. The groups were uneven as some were composed of a majority of people with Public Health as their main interest and subject for the semester and others didn't contained any people with a background in Public Health. The papers we had to present were especially difficult for people without a background in Public Health. It feels like this presentation was the result of management issues as it fell from nowhere at the end of the semester. It was frustrating for everyone as it wasn't representative of the work we done during the semester. I don't know what kind of results teachers expect from a work done that quickly.

Cellular Network of Biological Molecules

We attended long-distance courses with Tsukuba University and Kyoto University. Those courses presented cell mechanisms implied in cancer occurrence and propagation. We had to do a 30-minutes paper presentation and to write a research proposal. The research proposal had to answer one of the unanswered question raised by the paper. The proposal I wrote was about the screening of point mutation of a protein implied in gliomas. I've already taken such a long-distance course (called Cancer Biology) during the semester in Tsukuba.

Environmental and Occupational Health

We attended courses about environmental threats to health (pollution, water quality, occupational diseases…). We also had some site visits (details in "*Other*

Activity Report"). We had different kind of assignments:

- We had to do a report and a presentation about a public health issue in our country. I chose to speak about the mental status of farmers in France.
- We also had a midterm and a final term in which we had to answer questions about each course (around 12 reports of 1 to 3 pages each)
- We had to write reports after site visits (2 reports).

DNA Repair

We attended courses about the mechanism of DNA repair (assembly of the machinery implied in DNA repair and its regulation) presented by Pr. Egly. It was a balanced course in which precise mechnisms were shown but also lab methodology and little stories behind major discoveries. We had to present a technique used in molecular biology. We also had to present a paper. During the paper presentation, we had to underline the misconducts in it as the presented papers were all considered as suspicious by the scientific community.

Research and Development

I joined a lab in which I was supervised to conduct a small project and to write a research proposal (details in "*Current Research Activity Report*").

Food Safety and Health

We had to watch videos before each course than discuss them with the teacher during the course, who asked us question via the Zuvio system. We had to do two presentations and a video about food safety issue. We were marked by our classmates, a surprising system that was considered as pretty unfair y some students.

Reflection

Even though I'm genuinely interested in public health issues -as they're related to politic and socio-economic issues most of the time- and I have a background in medical science and molecular biology, most of the courses didn't match my current interests and the path I want to follow. I want to focus on plant virology and the effect of virus infections on food security. Therefore, I took a lot of course by default, only to get credits as the only course that kind of matched my subject of interest was Agriculture of Taiwan. The project I followed in the lab I joined was the most satisfying but unfortunately, I didn't have a lot of time to give to this subject. I'm surprised that the courses aren't more balanced between Agriculture and Public Health and hope that it will be better for the next batch.

< My Experience as a GIP-TRIAD Student in NTU >

Student Name : MASSEI Kimberley

Home University : University of Bordeaux

What I really enjoyed during this semester, is all the lab work I did.

In class, especially microbiology course (option), we followed a project studying *Cordyceps sp.,* a mushroom used in Traditional Chinese Medicine. Because I am really interested in bioactive compound that can be used for our health, I chose this course, and we did only practical work, in addition to our personal research work about *Cordyceps sp*. use and diversity.

According to our course schedule, we had to attend 3 compulsory courses : the 1st one, Contemporary issues in Global Health, was really interesting, it deals with all issues the world have to face and how Public health is useful to find a way to solve these issues. In this course you need to have a good general knowledge, or, if it's not the case, you need to prepare the course carefully thanks to the documents provided before the class in advance. I wasn't really familiar with this course, but thanks to the professors and the opinion of other students, we managed to build a good interactive course with debates and polemics. This course really opened my mind and led me think about many problems in the world, and not only in Europe ! that's a really good and important course, even if it's not my field. In this course we had to submit 4 reports about an issue or challenge the world has to face nowadays, in relation with the course. First, I chose to focus on Hepatitis. B around the world, and the discrepancies between low and high- income countries for vaccine supply, the help by association or government, I chose to focus on China (high prevalence in HBV and USA (low prevalence). This report helped me to have a larger view of the impact of the government and its decision regarding health regulation (free distribution of vaccines for the poorest category of residents, actions taken to improve population's lives (syringe-exchange program in USA) to eradicate the virus. The 2nd report focused on Canadian health system and the impact of physician payment methods on people's health. Also another report focused on arguments of people against immunization and its consequences, and a last one focusing on children's health inequities in Taiwan. Those reports gave me knowledge in health systems, governmental actions, disparities worldwide and people opinions around the world.

About cellular network course, we already had the same kind of course in Tsukuba, it's a long distance course. That's really interesting because it's focused on cancer issue, and that's a big problem in the world, and we all felt concerned about it. We studied molecular mechanism, transduction pathway, hypoxic environment and a bit of epigenetic to have a large view of what cancer is. It's a really good course, even if it's not a very long one because student presentation each course take a very long time, and that's difficult to keep focusing on the subject the group is dealing with, because of the limited time. Also, we had to do a final report and to propose an experiment (scientific proposal) of a study. I enjoyed this course.

The last course but the best one : Agriculture of Taiwan! It totally fits with my background, my passion for crops, plants, fruits, and it gave us too much knowledge

about Taiwan! We should have the same type of course for foreign students in France, it's really important to know the culture of the country we are living! We learned many things about crops, and its difficulties, pest control, pollution, farmer's incomes, mechanization, ancient species of animals and domestication…. A lot of so interesting things! I really loved this course. Tests were multiple choice questions about the course.

Food safety course was interactive and a mix of toxicology and risk management. It was important and I enjoyed it.

Finally, my best moment in NTU was in the lab of Plant Biology Institute. I joined this lab by passion for plants, and, finally, I decided to integrate this additional work in "fusion of field course". I carried out a research project on the Effect of MeJA on CRY1 localization in Col-0, under blue light conditions. In this place, I met the best persons I ever met in my life, they were so helpful, I learned so many techniques used in research laboratories, and I began to work in autonomy and to carry my first research project by my own, with the help of one other student sometimes! I am so grateful to professor Hsieh who gave me this opportunity. That will be the best work experience I will remember about my studies in Taiwan.

< Study Activities in NTU >

Student Name : Romain GARRIGUES

Home University : University of Bordeaux

Agro-Biomedical Laboratory Science Seminar

Seminars about:

- Using population genomics to investigate the demographic history of plants
- ParaStampand its applications to cell patterning, drug synergy screening and rewritable devices for droplet storage
- Liquid biopsy as a fundamental basis for precious medicine
- Trends in research foci in life science fields after 1970; from the analysis of over 30 million research articles
- Public Health Studies on Petrochemical Industry
- Grain quality of foxtail millet at the aspects of physicochemical properties and in vitro starch digestibility
- Reciprocal cross-regulation of VND and SND multi-gene TF families for wood formation in *Populus trichocarpa*
- Topoisomerase-targeting as the next generation medical intervention: Jekyll and Hyde

Theses seminars where interesting and permitted me to meet new professors and have a better open mind for my 4th semester, for example. Sometimes the subject was not my major but still attracting. I liked a lot of topic which let me the opportunity to ask questions directly to expert. I recommend it for the next generation.

Research, and Development for Agro-Biomedical Science

This course is my lab work. I worked on a new model for me, *Drosophila melanogaster*. Before studying it, I just had theorical knowledge but not skill and competence to practice experiments on it.

I worked on the elaboration of protocol for my project and a poster for example. I met professional people (my lab mates, professors and officer in the lab) who helped me to understand this new model, gave me advice (for my studies or to visit Taiwan), take time to show me what should I do… I was followed and leaded. I had a very good supervisor. Pr. TING was every time listening, if I have questions, problems, comments… Even if I didn't present the poster for the Life Science Building Poster Exhibition, she took time to let me understand HOW to do a poster, change and do my best. The exercise was a quite a great step forward. Try to think about what I want, how can I do it, simplify and popularize it was hard but rewarding.

I worked on genetic, the model is not plant, but it permits me to open other opportunities and the tool I used will be useful in my future studies/ jobs.

I tried to follow all Pr. TING's advice and I hope, she will be satisfied about what I did, do and done.

Internship in Taiwan

I do my internship in NTM (National Taiwan Museum). I met few time and keep

in touch with my internship's tutor. It was not an easy course at the beginning, very stressful. But I find my internship and I like it.

I have just one comment: maybe do a "clear" contract between companies and NTU. In Europe it's different we have a contract which need to be sign by the student, the company and the university. I had rules to follow, of course, but maybe a stronger partnership between the 3 supporters.

I really like what I do in this course. I can manage my time, create activities… I recommend it to student who need/want to know what an Asian company is or just improve some skills.

Agriculture of Taiwan

Very interesting course. At the beginning I was reluctant about the questionnaire at the end of this courses. We need to give back in a form our impression and comments about the course. It made me uncomfortable sometimes, for the professor (when it was monotone or totally off subject). But at the end, I think int's not only to prove that I was there but moreover to permit to next generation to have a better analyze/ knowledge about the agriculture of Taiwan.

Of course, all the courses were not in my interest, but I think it's a very interesting course and let us know more about this country, economy, fauna and flora… Jack is a good TA.

Cellular Network of Biological Molecules

Interesting course. We review all the cell interaction. We needed to do a presentation about article and we had time to prepare it. Course in relation with Tsukuba and Kyoto. It's a good opportunity to work with other universities.

KC is very pleasant and answer in the hour/minute by email if we have question(s). She is a very nice TA, and I hope students will have her next year.

International Companion for Learning (ICL)

Well… Maybe one of the most special human experience of my life. I did skype meeting with kids from Taiwan (in Chiayi). We discuss all together about my country, my life, but also, I learn more information about this beautiful country (what can I visit, what is the Taiwanese culture, place of the family…). I decided to create a game with kids "Monopoly of Roro" (I didn't choose the name). We played it during the last session. It's like a millionaire game, they answered questions about (animals, cartoon, tourism, ICL member, food and cuisine).

With ICL I could visit some places in Taiwan (Hualien, Chiayi, Miaoli). I met people from several countries like Bulgaria, Belgium, France, Korea, USA, Taiwan, Australia, Morocco, Japan, …. From all around the world. New relations are important.

It's a very nice Volunteering courses. I can't describe it more it should be live.

Contemporary Relations in Global Health

This course was interesting at the beginning. I was happy to learn more about public health like National Health Insurance in Taiwan, Non-Communicable Diseases, Global Health Agenda and Organization…. But I think because of a problem of communication we have been victim of "injustice".

At the beginning of June, they let us 2.5 days to prepare a presentation about 2

articles (~20p per articles). Of course, we are in master's degree and we read a lot of articles for our project or courses, but in was 2 imposed articles in a specific topic, not for all of us ours major. I can understand that we need to give some material to get score(s), but it does not have to be despite the students. We needed to register to a conference to have Bonus points. At the beginning it was not free (90US$ minimum for Taiwanese students). But after a "Problem of system" we could register for free. The communication of all the type of exam should be more precise since the beginning to don't "punish" the students.

Positive point: we could choose a subject for each month for a report about 2 pages max and 1 page max of reference. This exercise is good to help us to practice about writing reports.

Principle and Application in Health Research Methods

- All information of course is in the Chinese CEIBA, I'm lucky to have colleague who speak Chinese. In the English CEIBA course are totally empty but we are lucky to have other elements.
- Problem of communication
- Problem of explanation: I didn't know which subject I should choose, how many aims studies I needed to present. I waited answer from the TA (he replied me maybe a quite late and not precise).
- In this course, we are not all from this major (Public Health). I chose this course because of the Curriculum. But I was a quite disappointed and loosed when we had course. I didn't have the basis for every courses.

Good point: courses of statistics. The professor took time to exampling us and she understood that we are not ALL in public health before. She is a nice pedagogue. I took this course mostly for this part and I'm very happy about that. I hope it could be more for students from different backgrounds.

Reflectio
n

I really enjoyed my second semester in NTU. It was very different from Japan and France. I loved my life in my laboratory where I had a desk, wifi to work and people to give me advice and explain me some points I didn't understood even if I read articles or watch learning videos. This semester permits me also to discover a new country and a new Asian culture. The university, like in Japan, have a unique authenticity. I want to come back here even if it's not to study or work but to visit. I know that this document it's only my feeling, but I hope that for the next generation it will be more adapted to help them to be integrated (like I was) in this environment.

< Study Activities in NTU >

Student Name : LEANNEC Valentin

Home University : University of Bordeaux

During the semester in NTU, I took 15 credits corresponding to 3 mandatory courses (Agriculture of Taiwan, Contemporary Issues in Global Health and Cellular Network of Biological Molecules) and 3 optional courses (Fusion of Field and Laboratory studies, Applied Translational Microbiology and Food Safety and Health).

Agriculture of Taiwan

We had a visit of the rice museum and the "phytotron" of NTU. We had 13 class with different teachers talking about their research or subject related to their specialties. Those subjects were diverse and varied, about agriculture importance in Taiwan with review using numbers, its evolution, information related to domestication, geology, state of water, species used, technics or even mechanization. For this class, the content was mostly interesting, even when it was not related to our field of study, but lacked technical information, taking the form of lists to learn for the tests. The scoring was made by two sessions of MCQ and presence to class.

Contemporary Issues in Global Health

We had lessons related to public health made by professors presenting subject and including their own research activities. The class were mostly made to create an interaction with the students, giving ideas and forming debates. The content of the lessons was related to diseases, Health care systems, legislations, Worldwide acting organizations, ethic and actions. The evaluation was realized by presence, participation, 1 group presentation and 4 reports on subjects in link with the lesson of our choice. In my case, my reports were "Malaria in French Guiana" in relation with the vector-borne infectious diseases lesson, « Stress and Burn-out related to work overloading of health care professionals » related to Health system reform lesson and « Relation between Marijuana use and Schizophrenia » related to Mental health and drug abuse.

Cellular Network of Biological Molecules

The class was a video conference with the Universities of Tsukuba and the University of Kyoto. The lessons were mostly 1-hour class presented by professors introducing the content on cell biology, their mechanisms and relation to cancer, sometimes linking it with their own research or known examples. Those lessons were followed by 30-40 minutes presentations by a group of students on a scientific paper chose by the professor in relation with the presented subject. This class was scored on the presence, on the group presentation and on a report presenting a research proposal answering a question about our presented paper. The subject and papers were of variable difficulties, leading to difference on how the students with diverse backgrounds can understand the paper. The subject of my presentation was the miRISC pathway with microRNA interaction on targeted RNA for silencing, binding and isolation.

Fusion of Field and Laboratory Studies

I joined the laboratory of Professor Li Tsai-Kun on microbiology and worked on "Fermented Chinese tofu and bean curd", a Taiwanese processed food, and investigated to Isolate, identify and compare beneficial bacteria from this food famous in Taiwan for its beneficial properties on human health. During this lab work, I made growth and selection of bacterias on 4 different mediums, extraction and purification of DNA, PCR with primers "8F" and "1392R" for 16S rRNA, send the samples to sequencing and compared those sequence with internet Data base on NCBI. Furthermore, I worked on testing a method to identify the bacteria on human urine in relation with a laboratory project on FIV.

Food Safety & Health

This course were lessons related to toxicology, food products, food process, diseases, regulations and policies. The lessons were provided by online videos on the Zuvio platform. In class, MCQ were made on the lessons provide the same week on internet and a feedback is asked after every class. Two oral presentations on group or in solo were scored by the students. The subject of these presentations were our choices. My subjects were "Phycotoxins in le Bassin d'Arcachon" and "Phytoestrogens in Soybean and Soybean products". A video made by groups is asked before the end of the semester.

Applied Translational Microbiology

It was intended only by two students. This course content was mainly technics and understanding on fungi laboratory work and how to obtain a pattern on a natural product with health food effect. To demonstrate it, the experience was made on *Ophiocordyceps formosana*, with DPPH test, MTT assay, Adenosine and Cordycepin extraction and quantification using HPLC. Furthermore, after a field trip in Xitou, and catching samples of mushrooms and fungi pathogens on plants, those samples were identified on morphology and DNA via extraction and sequencing using the primers ITS1 and ITS4 of 5,8S rRNA.

Reflection

During this semester, the content of lessons and laboratory work was strongly more linked to medical science and public health, in contrary of agriculture, plant and food science.

< Study Activities in NTU >

Student Name : Minagi Uchida

Home University : University of Tsukuba

I took following courses in NTU.

Research and Development for Agro-Biomedical Science

I attended the seminar held by Prof. Shaw. We shared our progress and discuss it. That helped to make it clear what I would like to do, what I should do, what I should consider. In addition, I attended two lectures related to nutrition in NTU.

Environmental and Occupational Health

I acquired the basic knowledge about environmental and occupational health. We had opportunity to visit Centers for Disease Control, R.O.C. I observed some laboratories and I could learn what kinds of experiments are conducted and how they control it. In addition, we had a presentation end of this course. I gave a presentation about mental health problem in Japan.

Agriculture of Taiwan

I learned the current situation of agriculture of Taiwan in many aspects. My background was not agriculture, but I could acquire basic knowledge about agriculture thanks to this course.

Bio-Entrepreneurship Training

We had many invited speakers. We also had opportunity to visit company. Sometimes it was hard for me to keep up with their lectures because I am not familiar with terms related to business and course content was totally different from what l have learned so far. However, it was interesting because everything was quite new for me. I could learn a lot from this course.

Contemporary Issues in Global Health

I acquired a wide range of knowledge about public health through lectures and 4 reports. I focused on problems existing in Japan in every report. It was good opportunity to understand my country deeply.

Cellular Network of Biological Molecules

This course was held by 3 universities. Professor in each university gave a lecture about basic molecular and cell biology fields. We had a group presentation in this course. I gave a presentation about signaling transduction.

Food Safety & Health

I learned basic concept of food safety, toxicology and risk analysis in this course. Not only did we take classes but we also did many things in this course such as group presentation, case study, making video. In addition, we visited some companies. That was very good experience. I learned a lot through these activities.

< Study Activities in NTU >

Student Name : Mizuno Mamiko

Home University : University of Tsukuba

I mainly took courses of public health.

Measuring Burden of Diseases

I learned about global burden of diseases. As a final project, we estimated the burden of E-cigarettes.

Principal and Application of Health Research Methods

I learned the methods and the flow of health research. It was tough work for me but really useful. I wrote research proposal through this class and it helped me to understand my project clearly.

Contemporary Issues in Global Health

I studied global health from many aspects. I wanted to learn this earlier.

Food Safety

I learned basic knowledge of food safety. The class was really interesting, Professor Chiang's teaching way was unique and clear to understand. Company tour was also interesting.

Chinese Class

I took Chinese course. It was very good opportunity to make new friend from various countries. I learned the basic of Chinese so even after I leave Taiwan, I will study it by myself. In this class, we had a field trip to understand Taiwanese culture. We made pineapple cake and studied Taiwanese traditional wedding.

< Study Activities in NTU >

Student Name : Nobuyuki Akami

Home University : University of Tsukuba

I share mainly three studies which I experienced in NTU, medical aspect, agricultural situation in Taiwan and Chinese studying.

Firstly, I mention medical study. Especially, it could be said that one of the biggest content what I studied in NTU was public health. I took many lectures about extensive knowledge related to public health, such as health system structure and health insurance in Taiwan, epidemic in tropical regions for example malaria, dengue fever and so on. I also studied about environmental and occupational health such as air pollution and disorders related to working situations. Moreover, we compared with situations and treatments which other countries contain.

In fact, I found that Taiwan has especially good health insurance system regarding price. However, Taiwan also contains problems because of the system which means too cheaper.On the other hand, I was surprised that Japanese health insurance was evaluated high quality by foreign students in the class. Although I have never had dissatisfaction to Japanese health insurance, I had never thought the system was evaluated like that. I could recognize the characteristic and good/bad point thanks to acquiring knowledges of insurance in other countries and comparing with them.

In another class of environmental and occupational health, it gave me new views which I could not acquire in modern society of Japan. These are air pollution situation and philosophy for working attitude. Although Japan contained environmental problem forty to fifty years ago, there is almost no severe problem compare to other countries about air pollution. In fact, we contain problem about PM2.5 which mainly derived from China. However, it can be said that it is not severe compare to Taiwan and so on.On the other hand, I faced some situations which is that I should consider about radiation problem, related to Fukushima, and working situation. These were good opportunities for me to develop my opinions related to what Japan is containing.

Secondly, I mention agricultural and food culture aspects. In other class, I learned about agriculture in Taiwan as well. Taiwan was greatly affected by Japanese technologies especially in rice production field because of the history of occupation by Japan. Although I have known about it as Japanese before coming Taiwan, it was just knowledges. As I got lecture and saw actual facilities and technologies derived from Japan, my knowledges related to Taiwanese agriculture became my experiences. In addition, although I have been in Taiwan only several months, I could feel food culture in Taiwan by my own body.

Finally, I mention Chinese studying. In fact, it was optional class in this program. However, studying Chinese consists of big part of my life in Taiwan. Learning language in the local area where people usually speak is the best way to learn the language. I could feel Taiwanese culture from language and try to use and practice Chinese everywhere. Moreover, fortunately, I am able to be taught by my classmates who use Chinese as the mother tongue. This experience will be very

useful for keep learning Chinese in France and Japan even if learning period was short.

As summary, I am satisfied with studying in Taiwan. Learning aspects which I have not studied provided me the opportunity to consider about these and combine with the other concept which I originally contain. I acquired extensive knowledges here. It can be said that this fact is much for the philosophy of GIP-Triad program. I will combine the knowledges which I studied in Japan and Taiwan with what I will study in France.

Extracurricular Activities

Extracurricular Activities

< Experience of Field Trip and Learning in NTU >

Student Name : Chen-Pang Wang

Home University : National Taiwan University

This semester I had enrolled in many interesting courses and have join many field trip learning. I had not only worked on my own project but also received many instructions and experiences from professors and people from industries. The first course gained me the great experience was the Bio-Entrepreneurship Training. This course provided a broad lecture contents including guest speakers from different industries and field visiting. The guest speakers covered every aspect about entrepreneurship. People from management, patent consultant, NGO leaders shared their thought and experience about entrepreneurship. One of the guest speaker was Dr. Hsu from Epoch foundation. Dr Hsu gave a lecture advocated the importance of intellectual property and the development of knowledge base industries. We also visited the Epoch Foundation and its startup incubator Garage+. Garage+ provides spaces and mentorship for startup team incubation. It is the zero equity incubator provided the startup team with a diverse entrepreneurship environment and investors opportunities. The Garage+ can give future GIP students a great chance to create their own business.

The field study at NTU Experimental Forest Xitou Forest, the Xitou forest field course was organized by professor Shen and his team. The lecture offered us a great chance to learn mycology through the field sample collection and examination. The lecture offered the field study of fungus and basic knowledge of mycology. The field trip also visited other two NTU experiment field and factory. The first was the phoenix mountain nature education garden. The garden was mainly development and researching on the different tea species and produced the NTU brand black and green tea.

The visitation of Yi Mei Food Factory was organized by GIP office. Yi Mei is one famous old Taiwanese food brand. The food products from Yi Mei covered almost all our life. The Yi Mei has focusing on their food safety inspection and research. In the factory, there is the well-equipped laboratory. Their test subjects cover from micrograms to radiation contamination.

The visitation of Biotechnology and Pharmaceutical Industries Promotion Office (MOEA). The MOEA main mission was to bridge the private sectors and the government. They provide the foreign biotechnology and pharmaceutical companies investment facilitation and consultation.

At the end of semester, we had a chance to visit the Industrial Technology Research Institute (ITRI), ITRI is one of the world’s leading technology R&D institutions aiming to innovate a better future. Founded in 1973, ITRI has played an important role in transforming Taiwan's industries. ITRI is a great place for students to have their internship.

Xitou forest experiment tower

Visit the NTU wood processing factory

Tried tea at phoenix mountain nature education garden

Field lesson about Taiwan plant species in Xitou

Dinner with Professor Ohniwa

Field lesson in Xitou

< Phytotron Visiting >

Student Name : Hsin-yun Wang

Home University : National Taiwan University

In this semester, I went to several field trips in the courses. First, we have visited NTU Phytotron and the historical building "Workshop of Advanced Academy of Agronomy and Forestry" in the course of agriculture of Taiwan. A phytotron is an enclosed research greenhouse used for studying interactions between plants and the environment. NTU Phytotron provides the environment for plant studying and the building is using many ecosystems to save energy. Second, we went to Department of Statistics, Ministry of Health and Welfare in the measuring burden of disease course. We heard an oral presentation and visited the Health and Welfare Data Science Center. I got the realistic idea on how I can use the data from Ministry of Health and Welfare. Third, we visited the vector-borne & zoonotic infectious diseases laboratory in our required course, contemporary issues in global health.

< Visiting the Phytotron as well as the Historical Building>

Student Name : Li-Yun Lin

Home University : National Taiwan University

In May 9th, 2018, we visited the Phytotron in National Taiwan University. Professor Wand made a fantastic introduction speech of Phytotron to all the students who attend the lecture. We learned the history, purposes, mechanism and future plan of this building. To improve the plants' quality and make further research about precision agriculture, Phytotron provide a suitable environment to incubate more achievement.

After we visited the Phytotron, we visited the historical building "Workshop of Advanced Academy of Agronomy and Forestry", in where we learned the history of rice in Taiwan. We also see a lot of antiques there that told us the process of agriculture improvement in Taiwan. It is a nice place for foreign students to visit.

< Human Health in the Dramatic Changing Environments>

Student Name : Meng-Ting Yu

Home University : National Taiwan University

Air pollution in southeast Asia : Researth gaps and priorities in the region

I participated some seminars and also as a staff, in this conference, all the researchers came from different countries and shared their experiences, several great talks inspire me as a master student how do we create the health environment and how do we gain the professional knowledge are very import. In the past, I do not know the air pollution in Mongolia is worse than Taiwan. I met a student Sakala from Malawi, and she is working on air pollution in the south of Taiwan, which causes my question is the air quality in Africa is better than Asia. She explained to me that as the experience she had in Taiwan will be a mirror to prevent Malawi happen the same. She is preparing work in SGS in Malawi when she goes back. The concepts of contributing to the home country are very commendable.

ISEE meeting

Prof. Nakayama and GIP -Student

< Field trip in NTU >

Student Name : Szu-Chun Yang

Home University : National Taiwan University

During this semester in NTU, we got many opportunities to attend variety of field trips and other activities

Field trip - Xitou

We spent three wonderful days travelling around middle part of Taiwan. First, we went to Phoenix tea factory and had a feast with highland vegetables. Then we spent one whole day at Xitou experimental forest. I learned a lot from this trip, such as there are not only many different types of tea but also many different kinds of tea processes. TA of this trip also taught us how to collect and identify fungi with easy equipment. Prof. Li also mentioned that although bamboo trees are symbols of Chinses culture, but actually the leaves of bamboo are lethal to other species. It reminds me of the phenomena in Taiwan recently that we enjoy the cherry blossom too much so we cut down many original species to plant cherry trees. We should respect the nature and try to live with the balance. We had a good time!

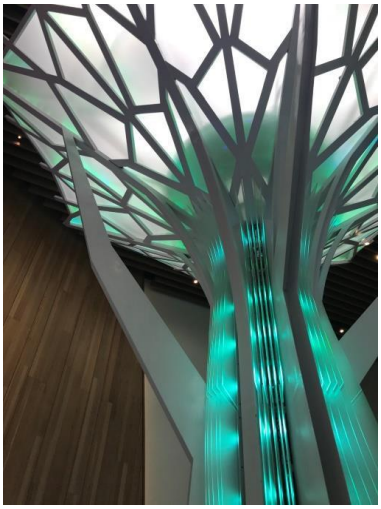



Field trip - Imei

It's really nice of prof. Li and prof. Chiang to arrange this field trip to IMEI, which is one of the most trusted food companies by Taiwanese. One of the managers mentioned that they try to use raw materials from Taiwan as many as possible and also make contracts with farmers to protect the price of their products and quality. According to his talk, I felt that they really want to make a progress with this land instead of just making profits out of it. It's an interesting trip.


Field trip – ITRI

During this filed trip, I realized that we already had so many innovative products been created by our brilliant scientists and researchers. Their business models is authorizing IP and assisting startups and spinoffs. It's really exciting to know how these products can make a huge difference to the future. (There is one easy creation, adding LED device in the middle of the firefighter's water pipe, so it can help firefighter to aim more accurate and efficient. So amazing!)



Field trip – Cordyceps company Mucho

We had an amazing dinner that every course served with cordycpes! First we see their lab and see the progress of producing cordyceps. Next we enjoyed the meal, which is really surprising because the chef literally put cordyceps in every course! And it tasted balanced, it's really amazing.

< Class-room activities, field trip and lab activities in NTU >

Student Name : Emilie GERICOT

Home University : University of Bordeaux

During this semester, in addition with the lectures where many class room activities and field trip were organized (as explained in the other report), I followed lab activities with my Taiwanese supervisor professor. I introduced the topic of my lab activities in the “Current research activity report”.

I decided not to do an internship in Taiwan during this semester, but I am going to do one in France during one month in July in a company that cultivates micro-algae and produces bio-active compounds used for the cosmetic and for the dietary supplements.

The other activity I did in Taiwan was travelling. Indeed, I was really interested in discovering this country where the habits and the culture are very different from France. Taiwanese people were very welcome to introduce me lots of places and to tell me their cultural practices during particular events such as the dragon festival or the lantern festival for example. Tasting the food was also a very good experience here!

GIP-Triad program in field trip and hiking

Delicious watermelon with Taiwanese Mango

< Site Visit and Field Trip in NTU>

Student Name : JOLIVET Marie-Dominique

Home University : University of Bordeaux

I attended some of the field trips proposed by the courses I've taken. In Agriculture of Taiwan, we visited the phytotron and the rice museum. The facilities and the monitoring system of the phytotron was presented (control of the temperature, of the humidity…). In Environmental Health, we visited the Center of Disease Control. This Center receive samples everyday (mostly human fluids but mosquito as well) and have to check if they're infected by vector-borne viruses. To do so, they use an ELISA technique that is built in such a way that 9 human samples can be tested for 4 different viruses at the same time and in a short time. The visit of the facilities, the explanations and the discussion we had with the members of the laboratory were very interesting.

In food safety, I joined the I-Mei industry visit: they presented their products, the history of the company, the organization of the factory hat produces buns and their food-safety labs. In those labs, they have high-end equipment to test whether unwanted chemicals contaminated the produced food. The visit was nice and the explanations were clear but it was quite surprising to see that all those well- equipped labs were quite empty with people.

I also joined the field trip to Xitao Experimental forest. Before joining the forest, we visited a tea field, were Oriental Beauty tea is made. It was a really interesting for me and I was quite excited about it because the tea culture was organics and they relied on integrated methods to control pests and to have a good yield. We then visited the forest, where the life cycles of different fungi were explained to us. We picked samples in the forest to examine them. Another speaker told us the story of this experimental forest and guided us in a tour in the bamboo part of the forest. Finally, on our way back to NTU, we visited the Wood Factory of NTU and the Science Museum in Taichung.

We had some group discussion in Contemporary Issues in Global Health, to analyze data for example or to discuss some issues and then present the result to the class.

< Company, Laboratories and Factory Visits in Taiwan>

Student Name : MASSEI Kimberley

Home University : University of Bordeaux

About field trip activities, that were facultative, I think that's the best point NTU GIP Staff did for us. It allowed us to see what's a company for real, we visited some labs, and for I-MEI company there was a bit of history, manufacture process, analysis (bacterial and chemical) and it was really good to see how an industry works ! We also seen all the machines needed for analytical part (Geiger counters, MS spectrometers, RMN and HPLC analyzers….) and also machines used for bread/bun process.

About Xitao field trip, it was really interesting ! I learned so many things directly in the field ! We walked in nature to collect many types of mushrooms, we heard about ancient and actual vegetation, history and also a little course with key principles of fungi classification. This 3-days trip was perfect ! Also, it enable us to share many unforgettable moments with each other. My favorite trip was to Grape King company, with microbiology course, all was well-explained, even if it was in Chinese, we visited the company, the labs (biological and chemical) and we visited the shop with many historical culture ! Also… Because it's focused on bioactive compounds and their use for health supplements, and because I'd like to work in this field later, I really felt good in this place !

Also we visited the Biotechnology and Pharmaceutical Industries Promotion Office, that can help us to find an internship, because it takes the responsibility to make a connection between the student and the company, and the companies together. The same day, we visited Nankang Software Park, it was really interesting to see that big space of 4000 square meters that is shared by many companies such as Oneness company, NBM etc. They have a common laboratory that they can rent by year or monthly and they can work together to use high technology machines and apparatus of Nankang place.

Lastly, we visited ITRI company, we just had a little introductive video of the company, its 26000 patents, the 5 branch of research including biomedical devices, health care devices, stem cell technology, drug development and botanical/medicinal plants used for drugs. A presentation of the best medical devices were presented, such as CheSEI- linker that is an artificial nanoscale solid electrolyte interface that stabilizes lithium battery electrodes, and that increases battery life up to 100%. It is use in Tesla model S battery to increase its endurance from 480km and battery life beyond 3000 charge/discharge cycles. It allows to reduce battery temperature (130°C) to avoid explosion. Other devices such as 3Dprinters, Exoskeleton Robots (upper picture), LCD waste Recycling system or calcium looping capture CO2 pilot plant were presented (buttom picture).

< Laboratory and field trip experience >

Student Name : Romain GARRIGUES

Home University : University of Bordeaux

ICL TRIP :

With ICL (International Companion for Learning), I join some trips

HUALIEN :

MIAOLI :

CHIAYI :

LAB:

With my lab during the spring break we visited YINGEE and DAXI (south of TAIPEI). We did ~50km by bike. I visited Yingge the morning during the waiting time (I came by train, but the return was by bike).

YINGEE :



PRESENTATION/READING CLUB:

With my lab I do reading club and talk about the discovery of genes and history of genetics (Watson & Cricks, Mendel …). We have also Presentation about articles advancement of research.

ACADEMIA SINICA:

I could go to some courses in academia sinica to have courses about “HOW TO DO A PROPOSAL”, “HOW TO DO A PRESENTATION” for example.

INTERNSHIP:

I did my internship in NTM (National Taiwan Museum). I was invited in the opening of the exhibition which I prepared. I went to restaurants with my colleagues.

TRIP WITH CLASSMATES:

We went to Hinshu in one of my Taiwanese classmate’s own town. We eat all together evet weeks. We planed some birthday parties, visited some places in Taipei.

VISIT BY MYSELF:

I visited some places in TAIWAN by my own:

– Taichung
– Taipei
– Keelung
– Yeliu
– Fulong
– Chiayi
– Wulai

PRESENTATION/READING CLUB:

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< Laboratory and field trip experience >

Student Name : Leannec-Rialland Valentin

Home University : University of Bordeaux

During the semester in NTU, field trip activities where arranged for the students. For students who took the course “Applied Translational Microbiology” or just wanted to come, a field trip to the Xitou forest has been managed to catch samples of mushrooms and fungi pathogens on plants in the nature. Furthermore, mycology with mushroom collect and identification through micromorphology and morphology of spores observed with microscope was introduced.

Visits to companies has been arranged for the GIP students. The visit of the company Grape King, a company specialized in food products and food supplements based on fermentation process, organized for the course “Applied Translational Microbiology”, permit to visit laboratories of analysis and research and development on their materials and products. Furthermore, their business history and communication to the public were presented.

The visit of the Imei company, specialized in food products, snacks and food with health benefit, leads to the presentation of their products, the process of fabrication, analysis and development of their products in laboratory. The visit of Mucho cordyceps company, a Taiwanese company with a restaurant creating and selling food products and foods supplements based on cordyceps they grow. The Biotechnology and Pharmaceutical Industries Promotion Office and Industrial Technology Research Institute (ITRI) visits are planned for the end of July.

During the semester, I worked in the laboratory of professor Li Tsai-Kun on microbiology for a project on “Fermented Chinese tofu and bean curd”, a Taiwanese processed food. The goal of this laboratory work was investigation to Isolate, identify and compare beneficial bacteria from this food and determine if its beneficial properties on human health are linked to its bacterial population. During this lab work, I made growth and selection of bacteria on 4 different mediums, extraction and purification of DNA, PCR with primers “8F” and “1392R” for 16S rRNA, send the samples to sequence and compared those sequence with internet Data base on NCBI. Furthermore, I worked on testing a method to identify the bacteria on human urine in relation with a laboratory project on FIV. The main goal of this lab work was the improvement of my laboratory skills, learning and applying techniques, developing a plan for a project, following the steps and adapt to my schedule, and working in minimum autonomy. The product was diluted in 2 groups, one for the tofu part of the product and one for the “sauce/liquid part”. Each sample was growth on the 4 selections medium and 5 colonies where selected on each for a total of 35 colonies transferred to a growth medium (one sample on one medium didn’t grow). After the DNA extraction, analysis and purification, 34 samples were send to sequencing for identification.

In the laboratory work for “Applied Translational Microbiology”, I mainly learned technics and understanding on fungi laboratory work and how to obtain a pattern on a natural product with health food effect. To demonstrate it, the experience was made on *Ophiocordyceps formosana*, with Adenosine and Cordycepin extraction and quantification using HPLC, DPPH test to analyze its antioxidant effects, and MTT assay to test its effect on human cancer cells. Furthermore, after the field trip in Xitou, and catching samples of mushrooms and fungi pathogens on plants, those samples were identified on morphology and DNA via extraction and sequencing using the primers ITS1 and ITS4 of 5,8S rRNA.

< Experience about field trip >

Student Name : Minagi Uchida

Home University : University of Tsukuba

I had a lot of opportunity to visit companies and institutions. Those were very good experiences.

Centers for Disease Control, R.O.C (Taiwan)

Centers for Disease Control, R.O.C (Taiwan) aims to combat the threat of communicable diseases.

We observed some laboratories and I learned what kinds of experiments are conducted. This site visit was good opportunity to review and develop my knowledge because my background is medical science and I have license of medical technologist.

Workshop of Advanced Academy of Agronomy and Forestry

Workshop of Advanced Academy of Agronomy and Forestry is a historical laboratory at National Taiwan University. The building was established during the Japanese rule of Taiwan.

I learned many things related to agronomy. There were many interesting exhibits related to Japan. I could acquire the knowledge about not only agriculture in Taiwan but also agriculture in Japan.

Cordyceps company

We observed cultivation process of Cordyceps and I learned many things about Cordyceps. Cordyceps is not that famous in Japan. We do not have opportunity to study about Cordyceps in Japan. Therefore, that was very good experience. In addition, we also tasted Cordyceps food.

I-Mei Nan-Kan Factory

I-Mei is one of the major suppliers for many well-known international retailers and fast food chains in Taiwan, such as McDonald's, Burger King, KFC and so on.

We observed museum, bread factory and food lab. We could learn about lot of things about this factory such as history, products and policy. The most interesting part was the efforts about food safety. I learned that they have five principles of quality assurance, check sources of raw materials, delve into the price of raw materials, reference all client list, develop the inspection competence, and aim to implement recognition. I-Mei has been making efforts to providing people with safe, good quality products under these principles. It was good opportunity to not only know about food safety in Taiwan bat also think about food safety in my country.

< Sugar-sweetened beverage consumption and obesity in different culture and school policy (Japan and Taiwan)>

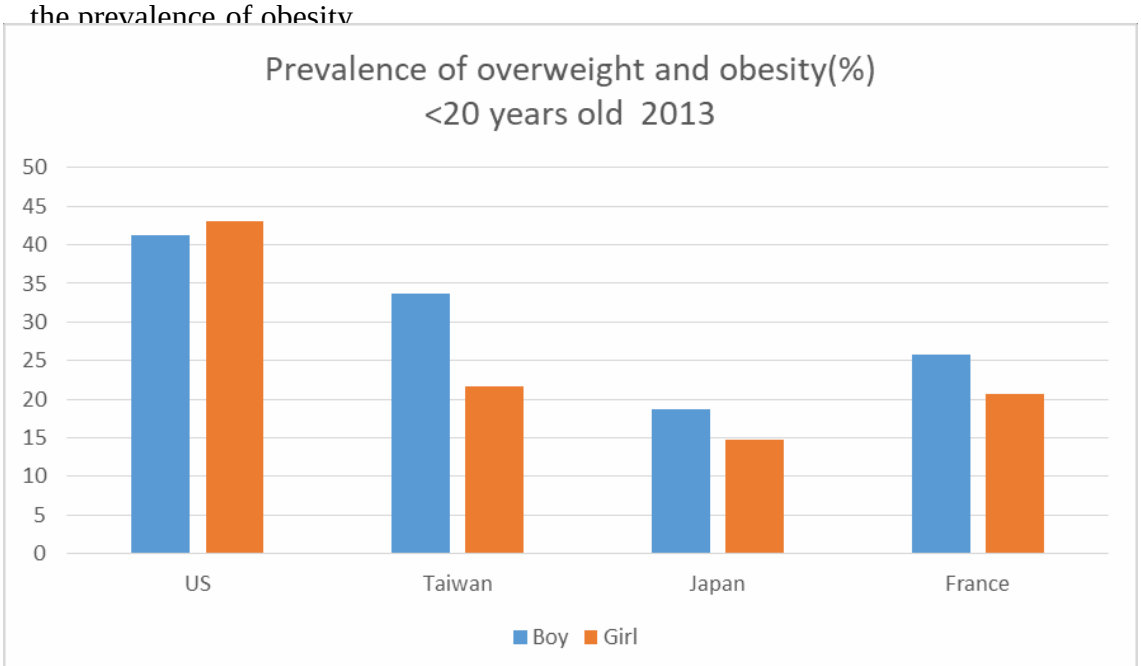
Student Name : Mizuno Mamiko

Home University : University of Tsukuba

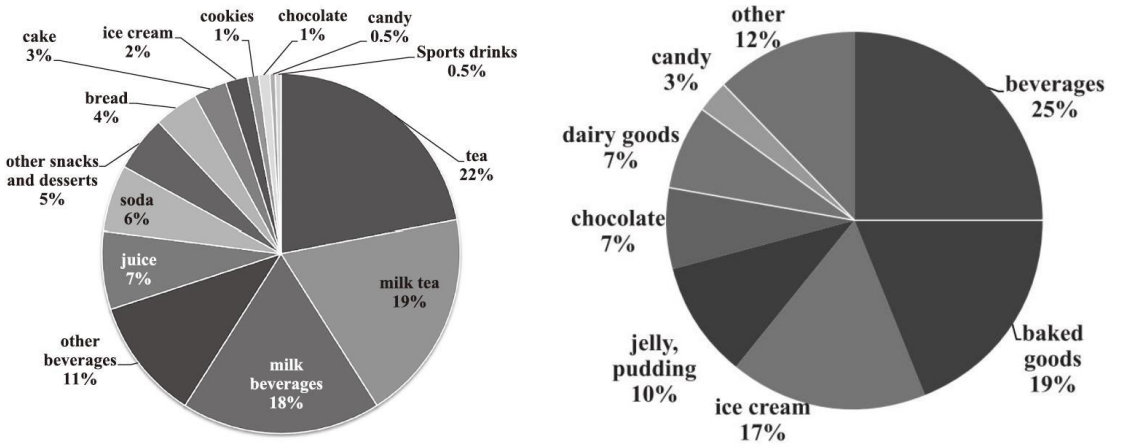
The problem of malnutrition around the world is not only undernutrition but obesity and overweight. The prevalence of obesity and overweight become large year by year. This problem become serious in low and middle-income countries.

In these days, the consumption of sugar-sweetened beverages (SSB) is increasing in the US and most westernized populations. It has been said that a greater consumption of SSB is associated with childhood obesity. Now, there is increasing interest in the situation of SSB consumption among children in their school and school policy to reduce SSB consumption. However these are different in each countries. In NTU, I focused on the cultural difference of SSB consumption and school life of Japanese and Taiwanese children and wrote a questionnaire to research the association between them and obesity.

Now, there is increasing interest in the situation of SSB and food consumption among children in their school and school policy. However these situations are different in each countries. In Taiwan, the ministry of education has agreed to amend the School Health Act to impose a ban on the sale of sugar-sweetened drinks at elementary, junior high and high schools. However, purchasing on the way is not permitted. In Japan, most of elementary schools ban beverages except water or sugar-free tea. Purchasing on the way is also banned. There is a possibility that the school policy or cultural difference of beverage consumption would effect to the prevalence of obesity.

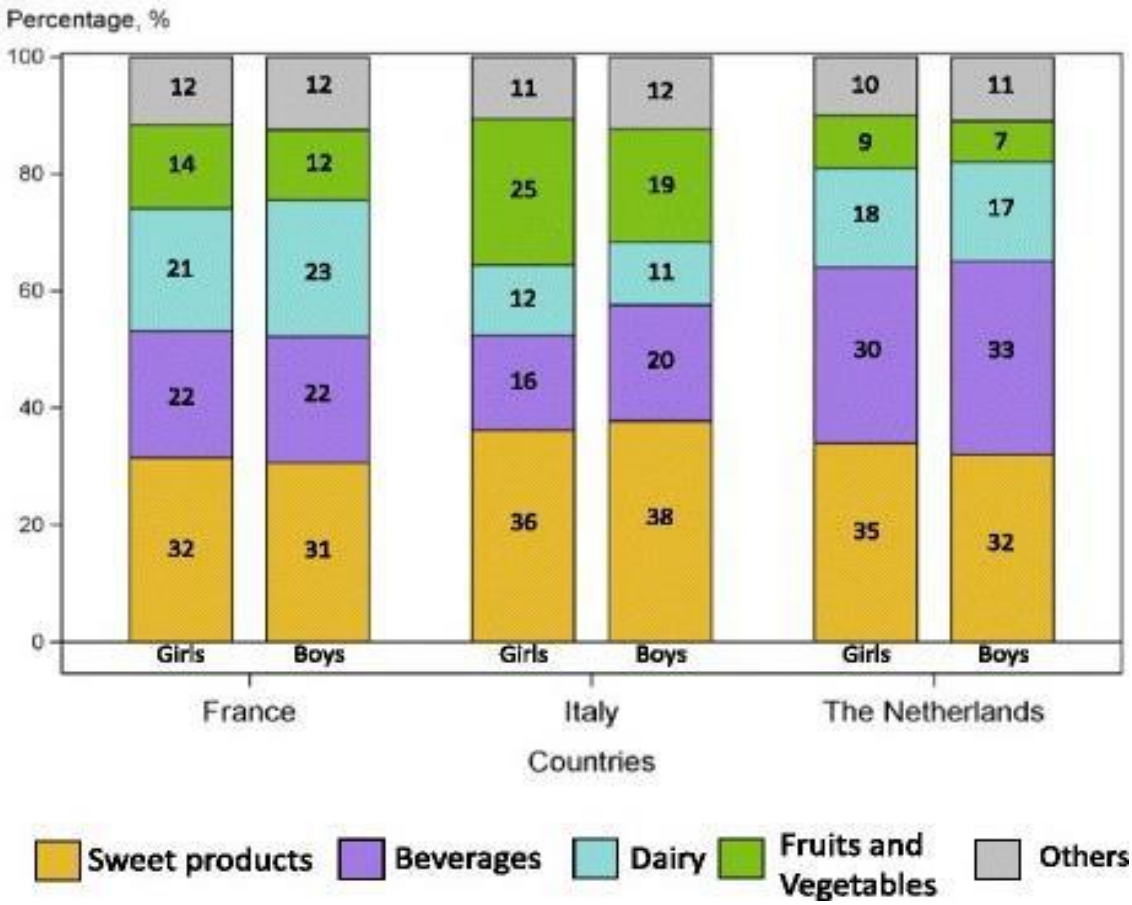


(The GBD 2013 obesity collaboration, Lancet 2015)



Contribution to total sugar intake. Right: Taiwan left: Japan
(Lin et al. 2016, Takeichi et al. 2011)

As shown in the graph, the sauce of sugar intake is different in each countries. Taiwanese children intake more sugar from beverages than Japanese and French children. French children intake sugar from dairy production, fruits and vegetables more than other country children. This difference would be related to cultural behavior including school life. I also found some information mentioning that the prevalence of obesity increasing is related to low-income or living place (city or country side). I want to research the environmental difference effect for obesity and social policy or social activity to solve the obese problem.



(Azaïs-Braesco et al. Nutrition Journal 2017)

< Good experiences in GIP program in Taiwan>

Student Name : Nobuyuki Akami

Home University : University of Tsukuba

I mention mainly two activities, site visit to I-Mei Nan-Kan Factory in “Food safety & health class” and Xitao field trip.

Site visit to I-Mei Nan-Kan Factory

The trip to I-Mei Nan-Kan Factory was very interesting and good experience for me. We were introduced their company, such as their products, history, production line, research and development part and treatment for food safety. The picture below is facility to introduce their history (Fig.1). In the trip, we could acquire real experience which is tasting their products, watching working situation and forest they were keeping, and lecture about preparing accidents about food safety.

The most impressive thing in the trip is one equipment they showed, which is for radiation level. They import some material from Japan. As people know, although Japan still have suspect about radiation, the company fulfilled their responsibility to prove the safety by measuring some data by themselves. This was good opportunity to consider quality control to operate food company.

Historical facility

Xitao field trip

Xitao field trip

Xitao field trip was good opportunity for me to feel Taiwanese climate and cultivation of tea. Since a part of culture, especially agricultural culture, is derived from climate and geography, it was important to visit production field in real. I could acquire some lecture about characteristic of Taiwanese tea, forest in Xitao and plant and mushrooms in the mountain.

In addition, we visited factory for manufacturing wood product made by the woods in Xitao. I could understand that production flow from material and their growing situation to production field. This experience was very useful to consider business model related to wood industry because business person should understand all situation about their field.

Contacts

NTU GIP Office

Address: Room 222, second floor, Sec. 1, Ren’ai Rd.,
Zhongzheng Dist., Taipei City 100, Taiwan (R.O.C.)

Director: Prof. Tsai-Kun Li
Tel：+886-2-23123456 ext. 88287/88294
E-mail: tsaikunli@ntu.edu.tw

Administrative Secretary: Carol Hsueh
Tel：+886-2-23123456 ext. 88594
E-mail: chsueh@ntu.edu.tw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