GIP TRIAD

Leap to the Future of Food & Health

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

2018

The third semester report

筑波大学 University of Tsukuba

國立臺灣大學 National Taiwan University

université de BORDEAUX

The Third Semester Report

University of Bordeaux

September – December, 2018

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Program presentation by the University of Bordeaux

Program factsheet

ACADEMIC COOPERATION

Consortium of three partner universities:

- University of Bordeaux (France)
- National Taiwan University (Taiwan)
- University of Tsukuba (Japan)

ADMISSION REQUIREMENTS

Candidates must fulfill the following requirements:

- Hold a Bachelor's degree with honors, or 4-year / 240 ECTS equivalent in any field,
- 1 or 2 years of professional experience in the field of international health.

LEVEL

Joint Master degree.

PROGRAM DURATION

2 years (120 ECTS).

LANGUAGE REQUIREMENTS

- English: certifiable equivalent of TOEFL score of 501/173/61, TOEIC score of 600, or IELTS score of 5.0.

TUITION FEES

- Master tuition fees applicable for the University of Bordeaux.

Program outline

This program trains students to become international professionals with the skills to carry out research and development in order to meet societal needs. Topics covered include the global-scale problems prevalent today in health maintenance and food security. The program tackles this challenge from a perspective that "food is medicine," or in other words, that both medicine and food originate from the same source and both preserve health.

Students benefit from the collaboration between three universities and spend at least one semester in each university. The program starts at the University of Tsukuba for the first semester, the National Taiwan University for the second, followed by the University of Bordeaux for the third. For the final semester, students may choose one of the three universities.

In addition to the coursework delivered by each university, students also partake in field studies, corporate internships, laboratory practice and entrepreneurship training, provided by each establishement.

Classes and all other educational activities are taught in English.

College of Health Sciences

université de BORDEAUX

Program structure

Three universities jointly organize the curriculum so that students acquire advanced knowledge and methodologies related to medical and agricultural sciences. They are also equipped with a global outlook that comes from practical training extending across Asia and Europe. The curriculum consists of the following subjects:

› Foundation subjects,

› Specialized subjects I,

› Specialized subjects II.

At the University of Bordeaux, the Agro BioMedical Science International Master provides students with cutting-edge, research-based training in plant science, biotechnology, health, nutrition, and food production.

Teaching covers the latest developments in toxicology, cancer, drug discovery, global health, applied translational microbiology, global food security, animal based food stuff, nutrition, agriculture, crop production, green biotechnology, omics and bioinformatics tools.

Upon completion of the program, students are asked to present a comprehensive report on integrated themes including research results or plans for community / social action related to health and food. This report should be based on the overall learning from the two-year educational program. The presentation and oral examination are conducted in English.

Strengths

During their studies, students:

› Acquire fundamental knowledge and skills regarding food security and health maintenance on a global scale.

› Acquire knowledge on processes, from identifying problems to implementing solutions, in order to develop effective and innovative measures that overcome current problems regarding food security and health maintenance.

› Develop skills in order to present and perform as leaders in international activities.

› Develop their capacity to create and innovate thanks to a mix of interdisciplinary knowledge and advanced practical research.

› Develop competencies to work for human and social welfare with an international perspective and cross cultural adaptability.

→ *And after?*

› Graduates may go on to complete a PhD program, in the fields of plant science, plant biotechnology, global health, applied translational microbiology, global food security, animal based food stuff, nutrition, agriculture, etc.

Graduates may carry out their PhD in one of the three universities involved in the academic cooperation, or in various Higher Education Institutes around the world.

› Graduates may apply for positions in companies that specialize in private breeding, as well as those specialized in food and nutrition, the extraction and valorization of plants and natural products, global health, applied translational microbiology, the development of sustainable agriculture practices, quality and safety of food production, etc.

How to apply?

› Applicants are assessed based on their application paperwork, a written assignment, group discussion, and interview in accordance with the admission policy.

› Each university performs an initial selection, which is then reviewed jointly by all three universities.

› Five candidates per university are admitted.

juin 2018 - réalisation : université de Bordeaux

Contact

PROGRAM COORDINATOR:
Dominique Rolin: dominique.rolin@u-bordeaux.fr

www.master-bio-agro-bordeaux.com/agro-biomedical

Introduction

Context

Many metabolic diseases such as obesity, cardio vascular disease, diabetes, cancers are the greatest public health challenges of the 21st century. Their prevalence has increased dramatically in many countries in Europe as well as in Asia, since the 1980s and the number of them continue to rise at an anomaly rate. Food & health are two issues central to human existence and they are inseparable in their relationship meaning « food is medicine » and hold the key to realising a « society in much illness is prevented before it occurs. Food-related health problems and lifestyle-related diseases, threats to food security (food availability at world level), and the increasing cost of medical care are just some of the many challenges society now faces. To face these myriad problems, there is a need for a fusion of agriculture and medical science in order to find solutions for a better society.

Aim

Our goal is to provide a unique opportunity to cultivate advanced professionals that can bridge R&D with societal needs to overcome global challenges in food and health in an international context. To achieve this goal, our program allows students to learn not simply by attending lectures but also by taking practical coursework in each country. We will provide students with cutting edge research-based training in Plant Science, Biotechnology, Health, Nutrition, Food Production. The teaching includes the most update advances in Toxicology, Cancer, Drug discovery, Global Health, Applied translational Microbiology, Global Food Security, Animal based Food Stuff, Nutrition, Agriculture, Crop Production, Green Biotechnology, Omics and Bioinformatics Tools. We will give the opportunity to follow some important biological question from the field to the laboratory, to work in group interacting with each other in day-to-day activities at the shared university facilities and taking a large variety of course will help the students to understand the fundamental behind the reality of the working world.

Meet UB GIP-TRIAD Director

Dominique ROLIN Ph. D.

Email: dominique.rolin@inra.fr

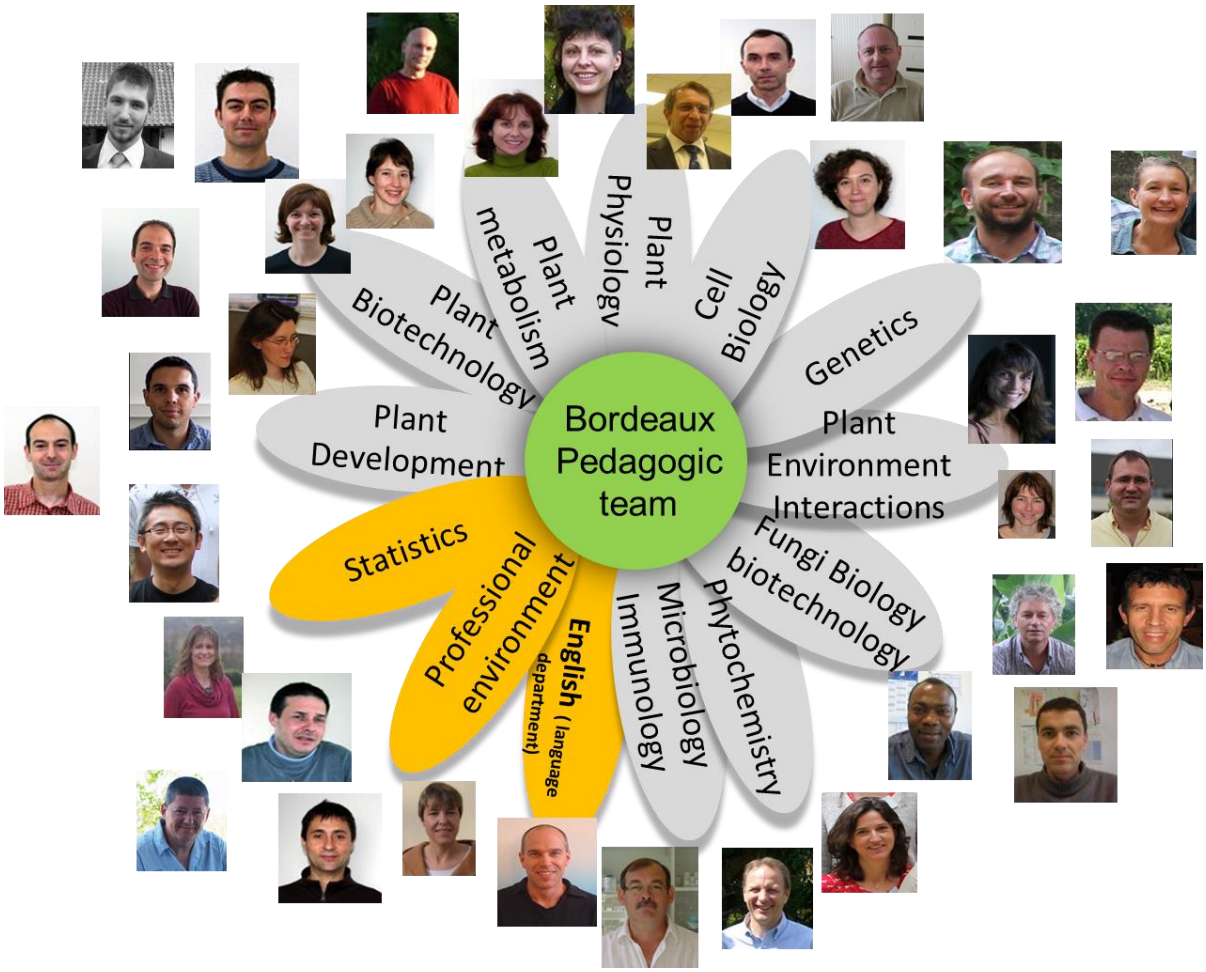
D. Rolin is professor at Bordeaux University since 1994 and has recognized expertise in the fields of plant biology, metabolism, metabolomics and fluxomics. D. Rolin is widely involved in the structuring of research efforts in the emerging field of functional genomics especially in metabolomics.

D. Rolin is deeply involved in the promotion of Metabolomics & Fluxomics in France as co-founder, treasurer (2007-2010) and President (2010-2016) of the French Metabolomics and Fluxomics Network (a French Scientific Society created in 2005). In 2002, he has set up and led the Metabolome Facility of Bordeaux today known as the MetaboHUB-Bordeaux Platform. From 2008 to 2019, Prof. D. Rolin has been heading « Bordeaux Functional Genomics Centre » a federation of seven technological devoted to the study of living organisms at cellular and molecular scales. Since 2013, D. Rolin is the coordinator of the French National Infrastructure for Metabolomics and Fluxomics (MetaboHUB).

Faculty members

Multidisciplinary, dynamic and competent pedagogic team

Bordeaux Pedagogic team is composed of Professors and Researchers at University of Bordeaux, French National Institute for Agricultural Research (INRA) and Bordeaux Science Agro (BSA). The diversity in the team brings dynamism and multi-disciplinary competences into pedagogique activities in the Master program.



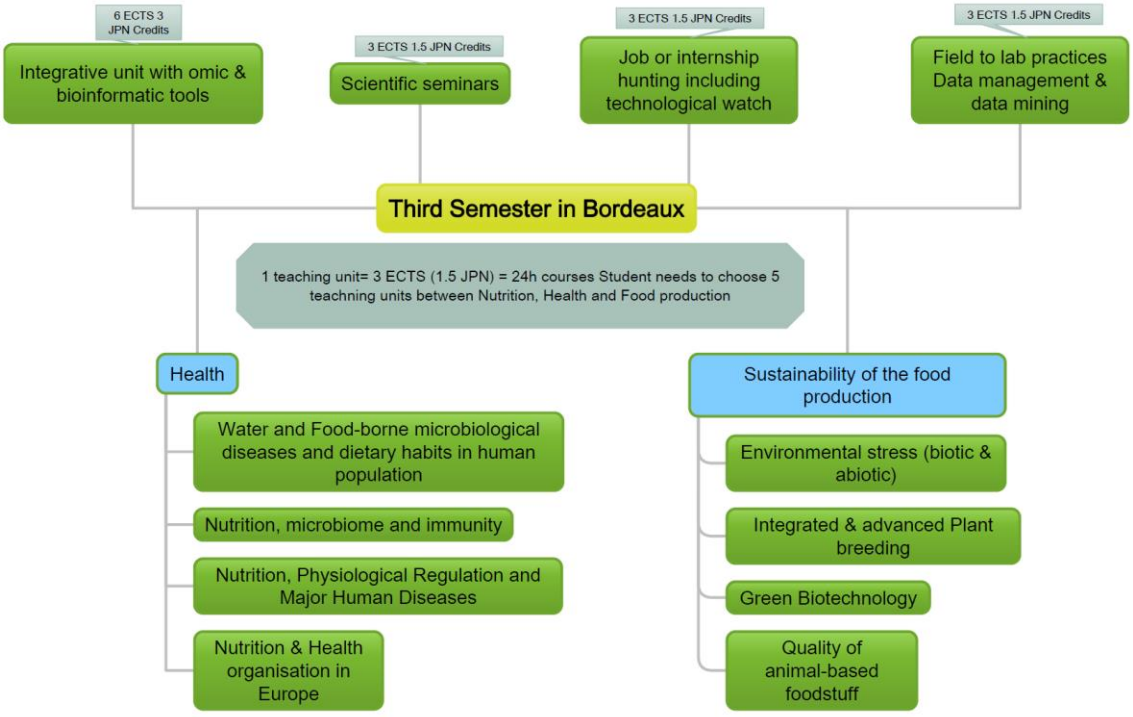
Campuses location

The courses take place on the different campuses in Bordeaux. The mandatory courses and courses in the field of Sustainable food production take place on INRA Green campus, courses in the field of Health science take place mainly on Carreire campus. For inter-campus transport, students use public transportation (Bus and Tramway), bicycle and their feet.

Course Information

Course general overview

In the third semester in Bordeaux, students acquire additional methodologies in food and health through hands-on experience, by utilizing access France's unique field environments in their coursework. Students can choose a major in the field of Sustainability of the food production or Health. The teaching units are presented below.



Course schedule

Elective | Mandatory | Exam

		8:00 to 10:00	10:15 to 12:15	14:00 to 16:00	16:15 to 18:15
10-sept.	Mon				
11-sept.	Tue	WFMD 1 Carreire Campus	WFMD 2 Carreire Campus		
12-sept.	Wed				
13-sept.	Thu			WFMD 3 Carreire Campus	WFMD 4 Carreire Campus
14-sept.	Fri			BioTK INRA Green Campus	BioTK INRA Green Campus
15-sept.	Sat				
16-sept.	Sun				
17-sept.	Mon	QPG INRA Green Campus	QPG INRA Green Campus	MPPI INRA Green Campus	MPPI INRA Green Campus
18-sept.	Tue	WFMD 5 Carreire Campus	WFMD 6 Carreire Campus	NMI 1 Carreire Campus	NMI 2 Carreire Campus
19-sept.	Wed	WFMD 7 Carreire Campus	WFMD 8 Carreire Campus	MPPI INRA Green Campus	MPPI INRA Green Campus
20-sept.	Thu	Biotek INRA Green Campus		BioTK INRA Green Campus	BioTK INRA Green Campus
21-sept.	Fri				
22-sept.	Sat				
23-sept.	Sun				
24-sept.	Mon	NPR 1 Carreire Campus	NPR 2 Carreire Campus	MPPI INRA Green Campus	
25-sept.	Tue	NPR 3 Carreire Campus	NPR 4 Carreire Campus	Internship hunting INRA Green Campus	
26-sept.	Wed	NMI 3 Carreire Campus	NMI 4 Carreire Campus		
27-sept.	Thu	MPPI INRA Green Campus	MPPI INRA Green Campus		
28-sept.	Fri	Bayer/Monsanto visit			
29-sept.	Sat				
30-sept.	Sun				
1-oct.	Mon	NMI 5 Carreire Campus	NMI 6 Carreire Campus		
2-oct.	Tue	NMI 7 Carreire Campus	NMI 8 Carreire Campus	IOB INRA Green Campus	IOB INRA Green Campus
3-oct.	Wed	WFMD 9 Carreire Campus	WFMD 10 Carreire Campus		
4-oct.	Thu			Internship hunting INRA Green Campus	
5-oct.	Fri				
6-oct.	Sat				
7-oct.	Sun				
8-oct.	Mon			MPPI INRA Green Campus	MPPI INRA Green Campus
9-oct.	Tue	NMI 9 Carreire Campus	NMI 10 Carreire Campus	IOB INRA Green Campus	IOB INRA Green Campus
10-oct.	Wed	NPR 5 Carreire Campus	NPR 6 Carreire Campus	IOB INRA Green Campus	IOB INRA Green Campus
11-oct.	Thu	PB 9-12 INRA Green Campus	PB 9-12 INRA Green Campus	Internship hunting INRA Green Campus	
12-oct.	Fri			IOB INRA Green Campus	IOB INRA Green Campus
13-oct.	Sat				
14-oct.	Sun				
15-oct.	Mon			MPPI INRA Green Campus	
16-oct.	Tue	NPR 7 Carreire Campus	NPR 8 Carreire Campus	BioTK INRA Green Campus	BioTK INRA Green Campus
17-oct.	Wed	NPR 9 Carreire Campus	NPR 10 Carreire Campus	IOB INRA Green Campus	IOB INRA Green Campus
18-oct.	Thu	PB 9-12 INRA Green Campus	PB 9-12 INRA Green Campus	BioTK INRA Green Campus	BioTK INRA Green Campus
19-oct.	Fri			NMI Exam Carreire campus	
20-oct.	Sat				
21-oct.	Sun				
22-oct.	Mon	QAF 1 M. Urdaci BSA Campus	QAF 2 M. Urdaci BSA Campus	WFMD Exam T. Noël Carreire Campus	
23-oct.	Tue				
24-oct.	Wed	QAF 3 M. Urdaci BSA Campus	QAF 4 M. Urdaci BSA Campus	IOB INRA Green Campus	IOB INRA Green Campus
25-oct.	Thu	QAF 5 M. Urdaci BSA Campus	QAF 6 M. Urdaci BSA Campus	Internship hunting INRA Green Campus	NHO C. Bennetau INRA Green Campus
26-oct.	Fri				
27-oct.	Sat				
28-oct.	Sun				
29-oct.	Mon	Holidays			
30-oct.	Tue				
31-oct.	Wed				
1-nov.	Thu				
2-nov.	Fri				

3-nov.	Sat				
4-nov.	Sun				
5-nov.	Mon		QPG INRA Green Campus		
6-nov.	Tue		QAF 7 MP Ellies Campus BSA	QAF 8 BSA Campus	
7-nov.	Wed			IOB INRA Green Campus	IOB INRA Green Campus
8-nov.	Thu	PB 9-12 INRA Green Campus	PB 9-12 INRA Green Campus		
9-nov.	Fri	IOB INRA Green Campus	IOB INRA Green Campus	IOB INRA Green Campus	IOB INRA Green Campus
10-nov.	Sat				
11-nov.	Sun				
12-nov.	Mon		QPG INRA Green Campus	Field to lab Carreire Campus	Field to lab Carreire Campus
13-nov.	Tue	QAF 9 BSA Campus	QAF 10 BSA Campus	QAF 11 BSA Campus	
14-nov.	Wed				
15-nov.	Thu	Internship hunting INRA Green Campus		BioTK PW (Practical Work) INRA Green Campus	BioTK PW (Practical Work) INRA Green Campus
16-nov.	Fri			BioTK PW (Practical Work) INRA Green Campus	BioTK PW (Practical Work) INRA Green Campus
17-nov.	Sat				
18-nov.	Sun				
19-nov.	Mon		PB INRA Green Campus		
20-nov.	Tue			IOB INRA Green Campus	IOB INRA Green Campus
21-nov.	Wed			Field to lab Carreire Campus	Field to lab Carreire Campus
22-nov.	Thu	PB INRA Green Campus	PB INRA Green Campus	BioTK PW2 INRA Green Campus	BioTK PW2 INRA Green Campus
23-nov.	Fri	Field to lab Carreire Campus		BioTK PW2 INRA Green Campus	BioTK PW2 INRA Green Campus
24-nov.	Sat				
25-nov.	Sun				
26-nov.	Mon	QPG INRA Green Campus	QPG INRA Green Campus	IOB INRA Green Campus	IOB INRA Green Campus
27-nov.	Tue	Mid-term evaluation at INRA		IOB INRA Green Campus	IOB INRA Green Campus
28-nov.	Wed	Mid-term evaluation at INRA		Field to lab Carreire Campus	Field to lab Carreire Campus
29-nov.	Thu	QPG INRA Green Campus	QPG INRA Green Campus	BioTK PW3 INRA Green Campus	BioTK PW3 INRA Green Campus
30-nov.	Fri	Internship hunting INRA Green Campus		IOB INRA Green Campus	IOB INRA Green Campus
1-déc.	Sat				
2-déc.	Sun				
3-déc.	Mon	NHO 1	NHO 2	MPPI INRA Green Campus	MPPI INRA Green Campus
4-déc.	Tue	NHO 3		QPG INRA Green Campus	QPG INRA Green Campus
5-déc.	Wed	NHO 4	NHO 5	NHO 6 (13h30-17h30)	NHO 7
6-déc.	Thu			BioTK PW4 INRA Green Campus	BioTK PW4 INRA Green Campus
7-déc.	Fri	Field to lab Carreire Campus		BioTK PW4 INRA Green Campus	BioTK PW4 INRA Green Campus
8-déc.	Sat				
9-déc.	Sun				
10-déc.	Mon	BioTK INRA Green Campus	BioTK INRA Green Campus	NHO 8 (13h30-17h30)	NHO 9
11-déc.	Tue	NHO 10		NHO 11 (13h30-17h30)	NHO 12
12-déc.	Wed				
13-déc.	Thu				
14-déc.	Fri				
15-déc.	Sat				
16-déc.	Sun				
17-déc.	Mon				
18-déc.	Tue			PB INRA Green Campus	PB INRA Green Campus
19-déc.	Wed	Exam			
20-déc.	Thu	Exam			
21-déc.	Fri	Exam			

QPG: lntegrated& Advanced PlantBreeding

PB: Plant Breeding

BioTK: GreenBiotechnology

MPPI: Impact of Environmental Stresses on Crops Production

FTL: Field to Lab with Data management and Data Mining

IOB: Integrative Unit with OMICs and Bioinformatic Tools

WFMD: Water and Food-borne Microbiological Diseases and Dietary Habits in Human Population

NMI: Nutrition, Microbiome and Immunity

NPR: Nutrition, Physiological Regulation and Major Human Diseases

NHO: Nutrition & Health Organisation in Europe

QAF: Quality of Animal-based food stuff

Course description

Integrative unit with omic & bioinformatic tools (from the biosynthesis of molecules to the positive or negative human health benefits)

Course Type:

Lectures/case studies with personal work

Outline:

Transcriptomics, proteomics, and metabolomics are three major platforms of comprehensive omics analysis in the science of food and complementary medicine. Other omics disciplines, including those of epigenetics and microRNA, are matters of increasing concern. The increased use of the omics approach in food science owes much to the recent advancement of technology and bioinformatic methodologies. Moreover, many researchers now put the combination of multiple omics analysis (integrated omics) into practice to exhaustively understand the functionality of food components. However, data analysis of integrated omics requires huge amount of work and high skill of data handling. This course will provide participants with biological examples of data integration in the fields of human nutrition, and the challenges that researchers face. The course will focus on the biosynthesis of molecules to the positive or negative human health benefits (vitamins, microtoxins, secondary metabolites as carotenoids or polyphenols) by exploring the biosynthesis path way and the behaviour in the food stream.

Instructor Information:

Prof. Dominique Rolin, Prof. Antoine de Daruvar, Prof. Michel Hernould, Prof. Catherine Bennetau, Associate Prof. Gérard Barroso, Associate Prof. Stéphanie Krisa, Prof. Thierry Noel

General Instructional Objective (GIO):

During this course student will learn about:

- the basic concepts, technical terms and technology involved of omic tools from the sample preparation to the exploration of the data
- how to read, understand and interpret omics research results
- the challenges and best practice for working in an integrated manner with genomic, transcriptomic, proteomic and metabolomic data
- Explore the field of nutrition through examples of molecules which have positive or negative human health benefits (vitamins, microtoxins, secondary metabolites as carotenoids or polyphenols)

Specific Behavioral Objectives (SBO):

Students will receive

- information about the harmful effects of toxic substances on humans, entering the food or formed in foods. The biological significance of toxic substances in food and influences acting on their rise.
- Information about vitamins and their natural source in plants, the biological significance and physiological role bio-availability and requirements, sources, deficiency & excess.
- Elementary idea of probiotics, prebiotics, organic Food
- Information about secondary metabolites produced by plants such as anthocyanes, carotenoids and their potential benefits for human nutrition

An example of student's work can be found in Annex I

From Field to Lab

Course Type:

Class/Lab work/Personal work

Outline:

Starting from questions of farmers and from the customer's demands, together with the students we design experiments to be performed in the lab. Then, the students harvest the resulting data and together with the teacher, students will choose the most efficient data mining way to process the results. In the last, the students work to present their analyses and their conclusions of the experiments regarding the initial professional and scientific questions. The objective of this teaching unit is to push the students to translate a socio-economic demand in scientific question that has to be solved, to build a project as a proposal for an application call, describing the work-package, the project management and the financial support. In addition, the student will work together with the teachers as project teams to develop skills in project team management and communications.

Instructor Information:

Pr Thierry Noel, Pr. M. Hernould

General Instructional Objective (GIO):

The students will visit farms and producer's experimental devices in order to discuss about the main problems encountered that affect production in terms of plant yield or quality. A particular focus will be paid to the ecophysiological status of the plants regarding the effects of abiotic stresses i.e. heat stress or biotic stresses induced by pathogens (viruses, bacteria or fungi). Concerning the customer demands, the students will study how to evaluate the quality of the plant production considering health benefits or health protection with a particular emphasis for safety (i.e. microbiological contaminant) or nutritional added value (i.e. secondary metabolites), etc.

Specific Behavioral Objectives (SBO):

1. Students will be able to generally translate the demands of the professionals into scientific questions ("From field");
2. Students will be able to learn how to solve the scientific questions by testing hypotheses in a lab context ("to Lab")
3. Students will be able to learn how to manage scientific questions and how to organise discussion with senior scientist
4. Students will be able identify/pose global-scale challenges related to Sciences based on themes related to plant production and human health;
5. Students will be able to learn how to summarize a seminar by extracting the main ideas and synthetize the topic born from discussions with invited scientists and other students;

An example of student's work can be found in Annex II

Job or internship hunting including technological watch

Course Type:

Personal work with tutorial courses

Outline:

Job or internship hunting aims to lead students to mature the mindset and skills required for internship or job hunting. Students will learn and practise the search for job openings and internships, and understand and practise the job application and interview process. In relation to their own professional project, students will explore career options, and relate personal skills, aptitudes, and abilities for future career decisions. The students will become familiar with job and career possibilities. In parallel, students will practise a technological watch on a specific scientific subject that they have chosen in link with their own professional project. Lectures are conducted in English.

Instructor Information:

Prof. Dominique Rolin, Associate Prof. Claudine Trossat

General Instructional Objective (GIO):

Students will:
• frame their own personal and professional project (market identification)
• explore the identified market and list the main economic actors in France, Japan, Taiwan and also in Europe, North America and Asia
• explore the job offers and understand the purpose of employment
• understand and practise the search for job openings, internships, and other work opportunities that match skills and abilities
• understand and practise the job application and interview process
• become familiar with job and career possibilities
• have to practise a biotechnological watch on a specific scientific subject
• learn how using technological watch and processing of information for strategic decision-making in order to be initiated to business intelligence.

Specific Behavioral Objectives (SBO):

Students will
• develop a career plan that would assist in the transition from university to the entry into a career option of their choosing
• demonstrate an understanding of the relationship among personal interests, skills and abilities, and career research
• understand the relationship of personal interests, skills, and abilities to successful employment
• analyse abilities and interests in relation to careers, set long-term career goals, and develop a plan for progressing toward those goals
• understand the concept of entrepreneurship as it exists in today's bioeconomy and agriculture
• develop job skills (e.g., communication, effective time management, problem solving, and leadership) through a tutorial and guidance experience (a technological watch on a specific scientific subject that they have chosen in link with their own professional project).

An example of student's work can be found in Annex III

International Scientific seminars

Course Type:

Seminar/ Personnal work

Outline:

Through participation in 10 scientific seminars organized by the Research Federation of Integrative Biology and Environment, students learn the field-specific knowledge and experience the international research seminars by senior scientists. The seminar subjects are dependant of the international invited scientists and related to Plant Biology, Biotechnology, Plant Physiology and Metabolism. The students will learn how to take note and write a concise resume of the seminars through tutorial courses. Students will get the opportunity to discuss with the invited scientists to bridge R&D with their scientific interest.

Instructor Information:

Prof Dominique Rolin, Prof Michel Hernould

General Instructional Objective (GIO):

Students will participate weakly to international scientific seminars organized by the Research Federation of Integrative Biology and Environment during the third semester. Students will get the opportunity to intend scientific seminars by international scientists invited by the Integrative Biology and Environment Research Federation. They will have to take note and produce a short resume of the talk. The students will learn how to take note and write a concise resume through a tutorial course. Students will get the opportunity to discuss with the invited scientists to bridge R&D with their scientific interest. Through this process, students will access many different scientific subjects related to plant biology. Students will contribute to scientific discussion and cultivate a better understanding of the fields related to plant science. Students will develop scientific communication skills.

Specific Behavioral Objectives (SBO):

1. Students will be able to generally describe/explain the contents of attended seminar sessions;
2. Students will be able identify/pose global-scale challenges related to Plant Sciences based on themes related to seminar discussions;
3. Students will be able to learn how to take note during a conference.
4. Students will be able to learn how to manage scientific questions and how to organise discussion with senior scientist
5. Students will be able to learn how to resume a seminar by extracting the main ideas and synthetize the topic born from discussions with invited scientists and other students;

Green Biotechnology

Course Type:

Lectures/case studies

Outline:

The objectives are to allow the students to deepen their knowledge in the most recent aspects of plant biotechnologies in terms of strategies and methodologies. This includes GMO use and regulations, genome editing technologies or synthetic biology. The course will focus on examples as to better understand the various strategies that can be used to set up research or industrial projects in this domain.

Instructor Information

Prof. Michel Hernould, Associate Prof. Fredéric Delmas

General Instructional Objective (GIO):

Students will acquire fundamental and practical knowledge relating to the most recent advances in Plant Biotechnologies and application to crop improvement. They will gain advanced skills in various fields of Green biotechnologies.

Specific Behavioral Objectives (SBO):

1. Students will be able to design/ evaluate strategies for metabolic engineering in plants;
2. Students will be able to design/ evaluate strategies for plant engineering with the aim to improve plant productivity, crop production quality, resistance to pathogens, or any other objectives
3. Students will be able to set up experimental design to evaluate the consequences of plant engineering on plant phenotypes;

An example of student's work can be found in Annex II

Integrated & Advanced Plant breeding

Course Type:

Researchers and teachers Lectures, case studies, data practicals, breeding companies visiting

Outline:

Plant Breeding plays an important role in the development of plant varieties for **food, feed and industrial uses**. Plant breeding is conducted by **international companies with strategic markets as European and Asian markets**. New varieties have to meet current demands regarding yield and biomass production, disease resistance, quality characteristics, salt or drought tolerance and suitability for **sustainable plant production systems as organic production**. Plant Breeding involves a variety of aspects, ranging from the molecular level as genes cloning to the population level and requires knowledge on **molecular biology, physiology, pathology, epigenetics, bioinformatics, biotechnologies and genetics of cultivated plants.**

The teaching unit will present the challenges of plant breeding for the 21st century, develop the up-to-date strategies for plant breeding including molecular markers, genes cloning, genomic selection, interaction genotype x environment and associated biotechnologies. Personal project will be conducted on breeding for quality, for resistance…on a chosen species.

Instructor Information

Associate Prof. Valérie Schurdi-Levraud, Associate Prof. Pierre-François Bert

General Instructional Objective (GIO):

Students will acquire fundamental knowledge related to plant genetics and breeding. They will understand the present and future challenges in plant breeding and the associated tools. They will understand the plant breeding framework at the world level.

Specific Behavioral Objectives (SBO):

1. Students will be able to describe and explain the interaction between phenotype, genotype and environment;
2. Students will be able to integrate tools to propose a breeding strategy depending on breeding objectives and species;
3. Students will be able to compare national policies related to plant varieties protection.

An example of student's work can be found in Annex IV

Impact of environmental (biotic and abiotic) stresses on crops production

Course Type:

Lectures/case studies

Outline:

Interaction of plants with environmental factors is a key parameter of their development and thus of yield and performance of crop systems. This teaching unit focuses on the impact of abiotic (temperature, light, water and nutrient availability) and biotic (phytopathogenic or symbiotic microorganisms) factors with crop physiology and productivity. Plant adaptation strategies and defense mechanisms will be presented. Finally, production of mycotoxins by filamentous fungal phytopathogenic species during plant infection will be studied as a response to plant defense mechanisms.

Instructor Information

Prof. Eric Gomès, Associate Prof. Gérard Barroso, Associate Prof. Virginie Lauvergeat

General Instructional Objective (GIO):

Students will acquire fundamental knowledge relating to plant environment interactions and their consequences on crop production. They will have basic notions of the molecular and genetic bases of mechanisms ruling plant stress responses and adaptations.

Specific Behavioral Objectives (SBO):

1. Students will be able to explain/describe the main effects of biotic and abiotic stresses on plant metabolism and development;
2. Students will be able to explain/describe the main phenotypic traits to target for crop stress tolerance breeding;
3. Students will be able to explain/describe molecular characterization of phytopathogenic agents;
4. Students will be able to use plant/microbe interaction knowledge to design sustainable alternative crop protection methods;

Water and Food-borne microbiological diseases and dietary habits in human population

Course Type:

Lectures/case studies with personal work

Outline:

Foodborne illness (also called called "foodborne disease," "foodborne infection," or "food poisoning) is a worldwide common public health problem. Microbiological foodborne illness are resulting from the food spoilage or from the contamination of water and food by pathogenic bacteria, viruses, or parasites, as well as from the presence of harmful chemicals and natural toxins produced by bacteria and filamentous fungi. These different diseases have many different symptoms, so there is no one "syndrome" that is foodborne illness. However, the microbe or toxin enters the body through the gastrointestinal tract, which constitutes the starting point of the disease.

Through examples chosen wihin the main microorganisms responsible for foodborne illness, such as waterborne virus (Hepatitis A, Norovirus), foodborne bacteria (*Salmonella, Campylobacter, Listeria, E. coli, Clostridium*) and parasites (*Toxoplasma, Amoeba, Cryptosporidia, Microsporidia, Taenia*), this course aims to present the life cycles, the natural reservoir and mode of transmission of these microorganisms, along with the physiopathology of the disease. Another aspect will deal with the major mycotoxins possibly present in food and beverage (Aflatoxin, Ochratoxin, Trichothecenes), emerging toxins (Enniatin, Beauvericin, Moniliformin) and their fungal producers. Information will be provided on acute and chronic toxicity, detection and quantification of toxin contamination, and European Union norms.

Instructor Information:

Prof T. Noël, Prof A. Blanchard, Prof V. Dubois, Associate Prof G. Barroso, Associate Prof I. Accoceberry, Associate Prof L. Beven, Associate Prof K. Dementhon, Associate Prof L. Rivière.

General Instructional Objective (GIO):

During this course student will learn about:

- Genetic diversity and molecular organization of viruses, prokaryotic and eukaryotic microorganisms
- Ecological niche and reservoir of food-contaminating microorganisms
- The process of water and food contamination and how to prevent it
- The main physiopathological disorders, their consequences on health and available treatments
- The more recent techniques to assess risk, detect and identify microorganisms and toxins, and determine the conformity with authorized safety levels.

Specific Behavioral Objectives (SBO):

- Having a global view of how to identify and manage the risk of foodborne disease
- To be able to collect, organize and present any scientific information dealing with foodborne disease
- Knowing the specific epidemiology of foodborne diseases according to the country of food production and processing

Nutrition, Physiological Regulation and Major Human Diseases

Course Type:

Lectures/case studies with personal work

Outline:

Major chronic human diseases such as diabetes and cardiovascular pathologies are characterized by interplay between genetic background and life style with an important nutritional component. In the extreme case derangements may lead to the "metabolic syndrome" with consequences on glucose homeostasis and cardiovascular organs. The recent increase in obesity and nutrition-related disease further underscores the necessity to understand the basis of the impact of nutrition/life style on health.

This course will provide participants with models of normal and altered nutrition homeostasis and paradigms to study their influence in animal models. The course will focus on nutrition signalling, integration, short-term experimental effects and long-term epidemiology, from the point of view of the whole body, organs and down to the cellular and molecular level.

Instructor Information:

Prof. J. Lang, Prof. J.P. Savineau, Associate Prof M. Raoux, Associate Prof NN,

General Instructional Objective (GIO):

During this course student will learn about:

- Nutrition sensing, energy repartition and homeostasis
- Basic concepts of molecular, cellular and integrative aspects in nutrition homeostasis and cardiovascular function
- Current animal and cellular models used in such studies
- How to read, understand and integrate corresponding research results
- Explore the field through examples of defined pathologies and molecules which have positive or negative human health benefits as well as therapeutic approaches

Specific Behavioral Objectives (SBO):

Students will receive

- An integrative view how major vital functions are regulated and how set-points are defined in physiological settings and influenced or changed by nutritional status.
- Information about experimental and therapeutic approaches as well as molecular effects of nutrients and drugs.
- Elementary idea of the genetic landscape that influences the systems

Nutrition, microbiome and immunity

Course Type:

Lectures/case studies with personal work

Outline:

Deficiency in or inappropriate diet intake is associated with a lack in specific micronutrients which leads to dysfunction of the immune system essential to host protection. The different arms of the immune system can be affected by inadequate nutrition including the adaptive and innate immunity (T and B lymphocyte, monocyte, phagocyte or natural killer cell function and complement responses for instance). Various pathological conditions such as obesity, nutritional behavior disorders for example can affect the immune function leading to decreased protection against pathogen, chronic inflammation, autoimmunity or increased risk of cancer. This course is centered upon the interactions between nutrition, microbiota and the normal or pathological functioning of the immune system. These topics will be covered through the following specific axes:

Axe 1: Importance of diet and nutrients in the regulation and maintenance of the physiologic function of the immune system; diet-related inflammatory responses (chronic inflammation and associated pathologies: IBD, Cancer…)

Axe 2: Modulation of the immune system by adipokines in obesity and associated disorders.

Axe 3: Impact of dietary components on gut microbiome, immunity and inflammation and physiopathologic consequences (cancer prevention, autoimmunity)

Instructor Information:

Prof N. Larmonier

General Instructional Objective (GIO):

During the proposed course, students will be exposed and learn:

- The basic aspect of immune functions in physiologic conditions and in situations of inadequate nutrition
- The mechanisms by which nutrition impact the protective activity of the immune system
- Immune dysregulations related to changes in diet intake and the associated consequences (autoimmunity, chronic inflammation, cancer…)
- How nutrition affects the microbiota leading to change in immunity.

Specific Behavioral Objectives (SBO):

- Participants will acquire knowledge related to the modulation (positive or negative) of the different arms of the immune system by diet, how defaults or nutritional behavior disorders may indirectly affect immunity and the resulting physiological consequences.
- Student will acquired skills to critically assess results in the field related to the links between nutrition, microbiota and the induction and regulation of immune responses.

Quality of animal-based foodstuff

Course Type:

Lectures/Collaborative work/Practical training (24 hours in total)

Outline:

Animal foodstuff quality is currently assessed using techniques either equivalent to those used for plants or using specific techniques. In this training program the animal foodstuff quality and its assessment will be presented via theoretical and practical methods. The quality assessment proposed is:

1. a sensory and textural evaluation (mechanical approach / rheology) of animal based foodstuff following the food standard evaluation system adopted in Europe
2. a composition evaluation based on nucleic acid detection and identification in order to characterize fraudulent use of animal matter in processed food.

The team is currently developing original and innovative methods based on aptamers for taste evaluation of animal-based foodstuff. The practical training will take benefit of this innovative approach.

The team is also developing laboratory analysis using DNA probes specific of animal material. This allows checking for the identity of the food-products used to prepare processed food.

Instructor Information :

Prof. Dominique ROLIN (UB), Prof Maria URDACI (BSA), Ass Prof Marie-Pierre ELLIES, Dr Guillaume DURAND (BSA), Ing Anne-Marie ELIE (BSA)

General Instructional Objective (GIO):

Beside lectures presenting the different criteria on which animal-based foodstuff could be analyzed according to the European standards practical training will be organized to show how the sensory and textural evaluation (mechanical approach / rheology) can be determined on animal-based foodstuff and how DNA analysis can help detecting frauds.

Specific Behavioral Objectives (SBO):

Students will learn about the animal-based Foodstuff quality criteria. They will be asked to perform practical analysis.

Nutrition & Health organization in Europe

Course Type:

Lecture/Collaborative case studies/Practical training (24 hours in total)

Outline:

When the industry develops a new functional food it must integrate the Nutrition & Health system currently existing in the geographic area targeted. In Europe health is a public issue and is funded by governmental and European organisms. Therefore, several organisms exist at the country and European levels to assess health, foodstuff safety and to determine global nutrition policies. Because the different European countries have their own dietary habits, the regulations have to be adapted from one country to another following the same goals and aims. This course will explain the Food general policy in Europe as well as some countries specificity. It will present how food safety assessment is organized in Europe and in some European countries. The course will highlight the European regulations. This will include general considerations like consumers information, the food-law, the allegation system and the particularities of food supplements in the Nutrition approach. The toxicity assessments will also be presented both on chemicals and microorganisms.

Instructor Information:

Prof. Dominique ROLIN (UB) Prof Catherine BENNETAU (BSA) Ass Prof Benoît GROSSIORD (BSA)

General Instructional Objective (GIO):

Beside lectures presenting the general organization of the Nutrition & Health policy in Europe and some particularities in some European countries, documents on regulations will be presented. Case studies will be proposed to the students. They will have to be analyzed in small groups. Practical training will be organized showing how to assess the food quality for safety purposes.

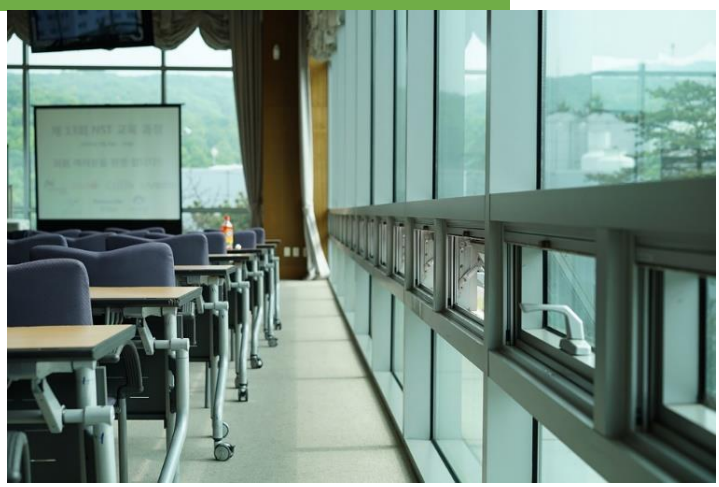
Specific Behavioral Objectives (SBO):

Students will learn about the Food policy in European Countries. They will be invited to compare the European regulations to those existing in their own country. They will have to search about Regulations in other part of the world. They will have to analyse a foodstuff searching for contaminant microbials.

International Scientific Seminars

Presentation list

During the third semester, the Research Federation of Integrative Biology and Environment organizes each Friday international scientific seminars. Students participated and got the opportunity to participate in a wide panel of research discussion. They learned how to take note and to write a concise resume through a tutorial course. Students had the opportunity to discuss with the invited scientists to bridge R&D with their scientific interest. Through this process, students had access to many different scientific subjects related to plant biology. Students contributed to scientific discussion and cultivated a better understanding of the fields related to plant science. Students developed their scientific communication skills.



Date	**Sep/21/2018**
Name	Prof. Soizic PRADO
Affiliation	Muséum National d'Histoire Naturelle, Paris
Title	Chimie des métabolites secondaires fongiques : natures, rôles écologiques et valorisation
Abstract	N/A

Date	**Oct/05/2018**
Name	Prof. Henri BATOKO
Affiliation	UCLouvain, Louvain Institute of Biomolecular Science and Technology, Louvain-la-Neuve, Belgium
Title	Autophagy and stress homeostasis in the plant cell: TSPO protein as a key player
Abstract	Translocator proteins (TSPO) are conserved membrane proteins with still an elusive function although extensively studies for more than four decades, mainly in animal cell. Plant TSPO are only transiently induced by abiotic stresses in the plant cell, and the level of TSPO is tightly regulated. Using the Arabidopsis AtTSPO as an example, we will provide evidence that the regulatory degradation of plant TSPO through the autophagic pathway is and underlying mechanism to protect the cell from oxidative stress and water loss. Our data so far have yielded exciting insights into an interplay among a stress protein, tetrapyrrole biosynthesis and scavenging, lipids metabolism, aquaporin activities and autophagy.

Date	**Oct/19/2018**
Name	Prof. Christian Chervin
Affiliation	École nationale supérieure agronomique de Toulouse
Title	Genomic and biotechnology of the fruit
Abstract	N/A

Date	**Oct/26/2018**
Name	Dr. Zhaobo LANG
Affiliation	Shanghai Center for Plant Stress Biology, China
Title	DNA methylation in fruits
Abstract	DNA methylation is a conserved epigenetic mark important for genome integrity, development, and environmental responses in plants and mammals. Active DNA demethylation in plants is initiated by a family of 5-mC DNA glycosylases/lyases (i.e., DNA demethylases). Recent reports suggested a role of active DNA demethylation in fruit ripening in tomato. In this study, we generated loss-of-function mutant alleles of a tomato gene, SlDML2, which is a close homolog of the Arabidopsis DNA demethylase gene ROS1. In the fruits of the tomato mutants, increased DNA methylation was found in thousands of genes. These genes included not only hundreds of ripening-induced genes but also many ripening-repressed genes. Our results show that SlDML2 is critical for tomato fruit ripening and suggest that active DNA demethylation is required for both the activation of ripeninginduced genes and the inhibition of ripening-repressed genes.

Date	**Nov/16/2018**
Name	Dr. Vikram ALVA
Affiliation	Protein Bioinformatics Group, Max Planck Institute for Developmental Biology, Tübingen, Germany
Title	On the origin of proteins from ancestral peptides
Abstract	The enormous diversity of today's proteins arose from the combinatorial shuffling of only a few thousand domain prototypes, most of which were already established at the time of the Last Universal Common Ancestor, ~3.5 billion years ago. The origin of these domains themselves, however, is unclear. We favor the proposal that the first folded domains arose by fusion, repetition, and recombination from an ancestral set of peptides, which originally served as cofactors of an 'RNA world'. In a comparative analysis of contemporary proteins, we have identified 40 fragments that occur in domains of different folds, yet are statistically similar both in sequence and structure. Based on their widespread occurrence, on their involvement in the most ancient functions (e.g. nucleic acid-binding), and on their occurrence in the most ancient folds (e.g. the ribosomal proteins), we propose that these fragments represent the observable remnants of the RNA-peptide world from which the first folded domains arose. More recently, we have furthered this hypothesis experimentally by building one of the dominant folds of today, the TRP fold, by the repetition of an ancient fragment taken from a ribosomal protein that is unstructured in the absence of RNA.

Date	**Nov/30/2018**
Name	Dr. Elisa PETRUSSA
Affiliation	Department of Agricultural, Food, Environment and Animal Sciences, Udine University, Udine, Italy
Title	Grapevine copes with stress: role of non-structural carbohydrates during drought and programmed cell death in oxidative stress
Abstract	Even though grapevine is in general, considered a water stress avoidant species (near-isohydric behaviour), varietal difference in the response against drought is actually not well elucidated to date. Among the complex array of molecular mechanisms, morpho-anatomical features and hydraulic adjustments responsible for grapevine acclimation to drought, it is also proposed a participation of non-structural carbohydrates (NSC) from parenchyma wood. NSC pool mobilization seems to be essential during recurrent cycles of xylem hydraulic failure leading to embolism and recovery of cavitated vessels. During abiotic stress, such as water limitation, heat stress, or soil pollution, as well as during hypersensitive cell death against pathogen attack, grapevine plant is usually subjected to oxidative stress, mediating programmed cell death (PCD) in some tissues. PCD is a genetically conserved, mainly but not only, mitochondria-driven process, necessary for the plant to selectively avoid damaged tissues and allow its survival. Consistently, recent evidences on plant mitochondria highlight the importance of mitochondrial permeability transition pores in the onset of PCD events.

Date	**Dec/07/2018**
Name	Dr. Marc-André SELOSSE
Affiliation	Muséum d'Histoire Naturelle, Sorbonne, Paris
Title	La symbiose : structures et fonctions, rôle écologique et évolutif
Abstract	N/A

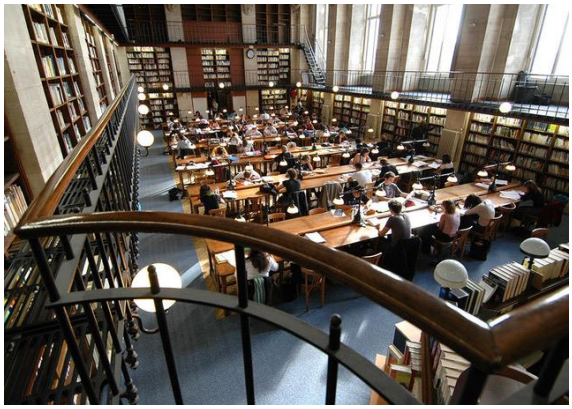
Activities in the third semester

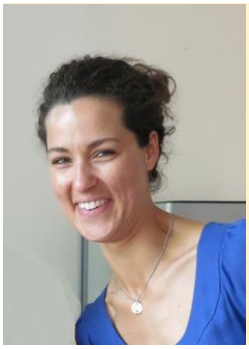
Welcome to Bordeaux

On August 30th and 31st, 2018, GIP-TIRAD students arrived in France and were welcomed by the UB GIP-TRIAD office in Bordeaux. They are 3 students from the University of Tsukuba, 5 students from National Taiwan University, and 5 students from the University of Bordeaux. The UB GIP-TRIAD office helps the GIP students for the procedures for entering the dormitory. Students benefited from the dormitory located on the Bordeaux Science Agro campus near the other UB campuses. A quick tour of the city of Bordeaux allowed the GIP students to locate the different university campuses and the city of Bordeaux.

GIP-TRIAD Freshman Guidance

On the morning of September 4th, the GIP students from three universities attended an orientation session with Anna GERYKOVA (International Mobility Officer) from the International Office on Talence Campus. Anna presented the student life on UB campus, explaining the necessary procedure to open a bank account and to apply for a residence permit card. For the UB administrative procedures, Anna explained in detail how to register at Bordeaux University, how to active the ENT (Environnement Numérique de Travail) account and how to get a wifi connection on UB campus. Anna went through the academic calendar, how to access French language courses and also how to find information on the UB web site and which persons to contact. Her presentation slides can be found in Annex V.





Anna GERYKOVA

International Mobility Officer
International Office - Campus Talence

During the afternoon, the GIP students attended an orientation session with UB GIP-TRIAD office on the Green Campus. This session was devoted to the presentation of the academic program. The heads of each teaching unit presented their discipline and the work expected during the third semester.

Enterprise visit (Bayer/Monsanto)

Date: September 28th, 2018

Venue: The factory of Monsanto at Peyrehorade 40300 France

Purpose: Discovering the biggest seed company in France and understanding *Fusarium graminearum* pathogen problematic on maize (Field to lab project).

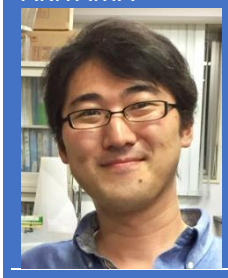
Introduction: Bayer/Monsanto is an agricultural company dedicated to innovation for a more sustainable agriculture. For more than 40 years in France, Monsanto has been a world-leading provider of technology solutions and products that improve farm productivity and food quality. The company works closely with farmers to develop and market corn and rapeseed seeds, vegetable seeds, and plant protection products.

In collaboration with local farmers, the factory's activities are: Drying, sorting, sizing, processing, packaging and shipping of maize and rape seed. The Laboratory of physiology and laboratory of genetic purity have been visited and presented by researchers of the company in the morning. Then, after lunch, a visit in the experimental field has been organised to allow the students to see how a seed company is studying the problem of fungi infection like *Fusarium.* Students asked a lot of questions to understand how the breeders of the company manage to select resistant genotypes and use them in the selection programs.

GIP Delegates Visited University of Bordeaux

October 22nd -24th 2018

University of Tsukuba

Name	Title	Affiliation	Research Interests
Dr. Yoshito KUMAGAI 	Coordinator of Global Innovation Joint Degree Program (GIP-TRIAD), Professor	Environmental Biology Laboratory, Faculty of Medicine, University of Tsukuba	Mechanisms by which chemicals causing oxidative stress and environmental electrophiles such as polycyclic aromatic hydrocarbon quinones and methylmercury affect living systems by interacting with sensor proteins with reactive thiols (thiolate ions) through chemical modification.
Dr. Masao ICHIKAWA 	Professor	Faculty of Medicine, University of Tsukuba	Public health issues among socially disadvantaged and vulnerable population.
Dr. Masahiro AKIYAMA 	Assistant Professor	Environmental Biology Laboratory, Faculty of Medicine, University of Tsukuba	Effect of environmental chemicals on the human body and its response mechanisms.
Ms. Youmei WANG 	Administrative staff	GIP-TRIAD Office	

National Taiwan University

Name	Title	Affiliation	Research Interests
Dr. Tei-Wei KUO 	Interim President, Executive Vice President for Academics and Research, Professor	Department of Computer Science and Information Engineering, College of Electrical Engineering and Computer Science	Embedded Systems, Real-Time Systems, Operating Systems and Non-Volatile Memory
Dr. Chang-Chuan CHAN 	Dean, College of Public health, Professor	Institute of Occupational Medicine and Industrial Hygiene, Global Health Center in Taiwan, College of Public Health	Industrial Hygiene, Air Pollution Control, Risk Assessment.
Dr. Tsai-Kun LI 	Director of Global Innovation Joint Degree Program (GIP-TRIAD), Professor	Department of Microbiology, College of Medicine	Topoisomerases, Topoisomerase-targeting drugs, DNA damage and repair
Dr. Shu-Chun TENG 	Professor	Department of Microbiology, College of Medicine	Stress Response and Aging, chromosome dynamics
Dr. Jing-Jer LIN 	Professor	Department of Biochemistry and Molecular Biology, College of Medicine	Stress Response and Aging, telomere-related researches, mechanism-based chemical probes for proteins
Dr. Han-Yi CHOU 	Chief of International Affairs Division Center for Biotechnology, Associate Professor	Graduate Institute of Oral Biology School of Dentistry, College of Medicine	Functional studies of SIK2 in insulin stimulation

Dr. Tang-Long SHEN 	Professor	Department of Plant Pathology, College of Bio-Resources & Agriculture	Cell Biology: Cell migration, proliferation, & development; Signal Transduction: Integrin & growth factor signaling; Cancer Biology: Metastasis, organotropism, & tumor exosomes; Molecular Plant-Microbe Interactions: RNA silencing & viroid
Dr. Huu-Sheng LUR 	Dean, College of Bioresources and Agriculture, Professor	Department of Agronomy, College of Bio-Resources & Agriculture	Crop Physiology Agronomy Plant Molecular Biology
Dr. Yuan-Tay SHYU 	Former Dean, College of Bioresources and Agriculture, Profesor	Department of Horticulture and Landscape Architecture, College of Bio-Resources & Agriculture	Food biotechnology, microbiology, agricultural policy
Dr. Shih-Torng DING 	Chair & Distinguished Professor, Office of Science & Technology	Department of Animal Science and Technology, College of Bio-Resources & Agriculture	Animal Science, Nutrient-gene interaction; Obesity and metabolic regulation
Dr. Shu-Jen WANG 	Chair of CIAEAE (Center for International Agricultural Education and Academic Exchanges), Professor	Department of Agronomy, College of Bio-Resources & Agriculture	Regulatory mechanisms of starch synthase gene in the sink and source tissues of crops Mechanism of sugar transport in plant tissues Regulatory mechanisms of biological clock on plant gene expression
Dr. Kuo-Tan LI 	Associate Professor	Department of Horticulture and Landscape Architecture, College of Bio-Resources & Agriculture	Fruit crop physiology
Ms. Carol Hsueh 	Administrative staff	GIP-TRIAD Office	

Meeting with future GIP students

On Monday October 22nd, the members of delegations from UT and NTU presented the GIP-TRIAD program to the undergraduate students of the Faculty of Science (University of Bordeaux). This meeting took place on the Talence campus. Several videos presenting the Universities of Tsukuba and Taiwan were screened and commented on. French students were able to ask many questions about the program, student life on the UT and NTU campuses.

Meeting with new staff of UB international office

On Monday late afternoon October 22nd, a meeting brought together representatives of the International Office (VP Joanne Pagèze, VP Laurent Servant, Véronique Debord-Lazaro, Pedro Santiago and Pierre-Yves Tourpin) and all the members of the delegation from University of Tsukuba and National Taiwan University. This meeting made it possible to strengthen, within the framework of the GIP-TRIAD programme, the collaboration of the three universities in linking training and research.

Visit to ISVV

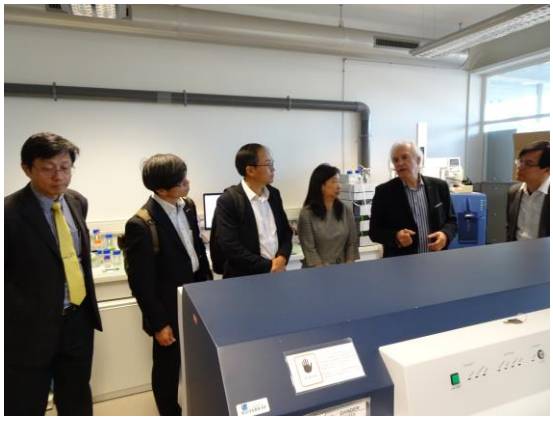
On Tuesday afternoon October 23rd, the members of the delegation from University of Tsukuba and National Taiwan University were invited by Prof Alain Blanchard and Prof Michael Jourdes to visit the Institute of Vine & Wine Science (ISVV, https://www.isvv.u-bordeaux.fr/en/)

Situated at the heart of the world's N°1 fine wine production region, the University of Bordeaux Institut des Sciences de la Vigne et du Vin is a multidisciplinary higher education, research and development center dedicated to meeting the challenges facing the wine industry of tomorrow. The Institut des Sciences de la Vigne et du Vin brings together all research, training and technology transfer teams of the numerous partners working in the wine sector on the Bordeaux site. A building offering over 10,000 m² of space on the INRA (French National Institute for Agronomic Research) site at Villenave d'Ornon houses some of these research teams and nearly 400 students.

Visit to CGFB

On Tuesday morning October 23rd, the members of the delegation from University of Tsukuba and National Taiwan University were invited by Prof Dominique Rolin to visit the Bordeaux Functional Genomics Center (CGFB, https://cgfb.u-bordeaux.fr/index.php/en).

The Bordeaux Functional Genomics Center (CGFB) brings seven scientific and technological platforms together, dedicated to the study of living organisms at cellular and molecular scale. The platforms ensure the mutualisation of analytical and technological skills and of heavy equipment for use of public and private research laboratories. The two delegations visited the Imaging PF (http://www.bic.u-bordeaux.fr), proteome PF (https://proteome.cgfb.u-bordeaux.fr) and Bioinformatics PF (https://www.cbib.u-bordeaux.fr).



Meeting with President

On Tuesday late afternoon October 23nd, the President Tei-Wei KUO has been invited by the President Manuel Tunon de Lara to discuss education and research collaborations including CiC and GIP-TRIAD between NTU and UB. Ms LU Mei-Chen (Director of Education – representative office of Taiwan in France) has also joined this meeting.

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Meeting with GIP students

On Tuesday late afternoon October 23nd, the GIP-TRIAD Students presented a feedback on their own experience of the GIP-TRIAD. The students were split in three groups. One group presented a comparative analysis on learning practices between the three universities. The second presented the lab work experience in UT and NTU, while the third group compared the logistics of the 3 universities. (registration and visa procedure in the three countries, cost of living, etc.). The 3 power-point presentations can be found at the end of this chapter.

Visit to Chateau Luchey-Halde

On Tuesday evening October 23nd, Olivier Lavialle, the director of Bordeaux Science Agro invited the delegation from University of Tsukuba and National Taiwan University for a visit of Chateau Luchey-Halde (http://luchey-halde.com) and a dinner in the big reception room of the estate.

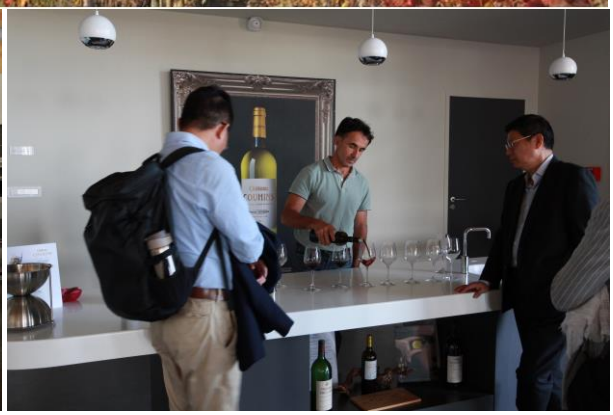
Over the centuries, many properties have disappeared as a result of crises and the expansion of the Bordeaux urban area. In 1999, Bordeaux Sciences Agro recreate a vineyard in order to make it a showcase for its know-how.

This exploitation is a place for sharing and transmitting knowledge. It is an educational tool accessible to all engineering students in the fields of production, financial management and marketing of wine.

Visit to Chateau Couhins

On Wednesday October 24th, the UB GIP-TRIAD office invited the delegation from University of Tsukuba and National Taiwan University for a visit of Chateau Couhins (http://chateau-couhins.fr/en/le-domaine/).

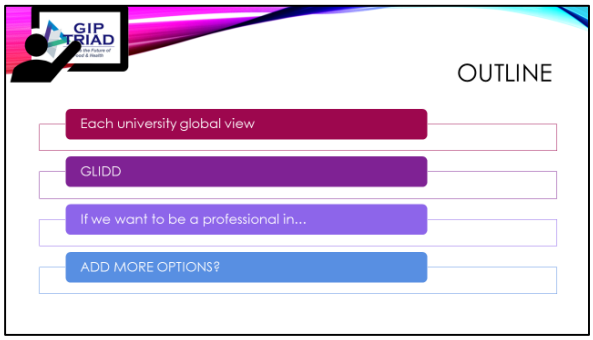
French National Institute for Agricultural Research (INRA) and the château's current owner, are conducting targeted research into suitable food sources, the preservation of the environment, and the development of competitive, sustainable agriculture. The main areas of research are precision viticulture (geographic information technology) and "integrated" production or research into reducing inputs. The implementation of these projects by INRA has determined the property's development and seen its "return to the light". Dominique Forget, Director of Chateau Couhins, guided a tour, ending with a tasting session.

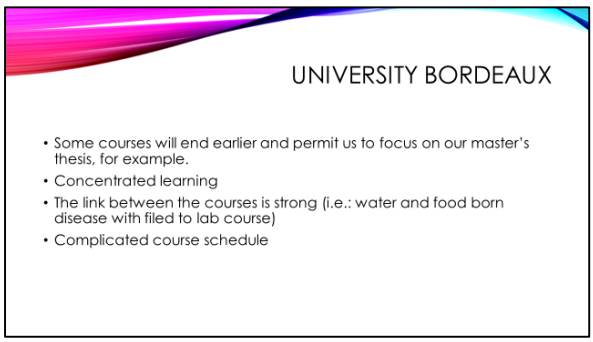


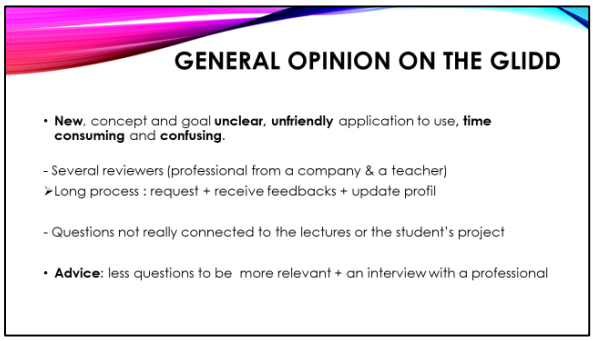
Discussion on Double Degree program UB-NTU

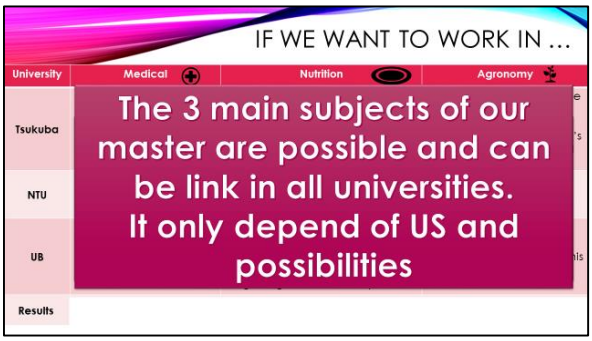
On Wednesday October 24th, the pedagogic team of the Bordeaux Biology Agro Science Master invited the delegation from National Taiwan University for a discussion for the development of a double degree program on Biology and Agro Science between UB and NTU. The further discussion was programed when the representatives of the pedagogic team (Michel Hernould, Valérie Schurdi-Levraud and Frédéric Delmas) visit NTU in next June 2019.

Student feedback on the 3 semesters









ADD MORE OPTIONS (UNIT TEACHING)?

- Add more possibilities for laboratories/enterprises and create some **focus project**. To have a following between all universities.
- Have more possibility in each universities to work in medical/ agronomy/ Nutrition but also marketing.
- Why marketing? ➔ Nutrition/ agronomic or medical products can be sold and in our master degree we can work on it.

Thank you for your attention

GIP TRIAD
Leap to the Future of Food & Health

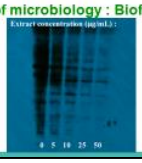
筑波大学 University of Tsukuba

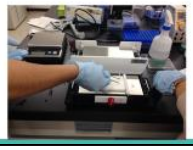
université de BORDEAUX

Lab work experience in UT & NTU

Research & development course

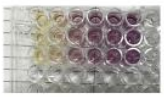
- Extraction of phytochemicals from wasabi/coriander
- Reaction of phytochemicals to protein thiols (Western Blot)
- Cell viability assay (MTT assay)
- A bit of microbiology : Biofilm assay





Optional microbiology course in NTU

- OBSERVATION & ISOLATION OF AN UNKOWN FUNGUS (SSI)
- PCR preparation & DNA sequence identification to identify fungi
- HPLC analysis for bioactive compounds screening (in *O.sinensis*)
- CELL VIABILITY AND ANTI-OXIDANT ASSAYS O.FORMOSANA



Additional lab work

- Transformation of lettuces by *A.tumefaciens*, in order to introduce in it mirucalin biosynthesis pathway. Lab Pr EZURA, Gene research Center
- Phenol extraction, phenol quantification and MTT assay in Pr Y.KUMAGAI laboratory of toxicology
- Localization of CRY1 durin… …genesis under Blue light & MeJA ac… …ory of plant biology of Pr H-L. Hschieh

Lab work experience in UT

- Prediction of novel pathogenic mutations in large-MAF family

Clinical information

OMIM®

ClinVar

Protein alignment

UniProt

Jalview

Updated clinical information of MAFs mutations

OMIM®
https://www.omim.org/

ClinVar
https://www.ncbi.nlm.nih.gov/clinvar/

e.g.) Report of MAFB mutations in OMIM

608968

V-MAF MUSCULOAPONEUROTIC FIBROSARCOMA ONCOGENE FAMILY, PROTEIN B; MAFB

Allelic Variants (10 Selected Examples) :

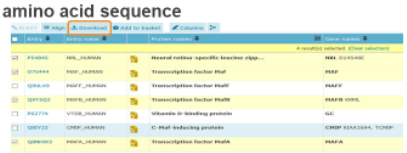
Number	Phenotype	Mutation	dbSNP	ExAC	ClinVar
.0001	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, THR62PRO	[rs387907004]	-	[RCV000023747]
.0002	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, SER70ALA	[rs387907005]	-	[RCV000023748]
.0003	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, SER70LEU	[rs387907006]	-	[RCV000023749]
.0004	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, PRO71SER	[rs387907007]	-	[RCV000023750]
.0005	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, PRO71LEU	[rs387907008]	-	[RCV000023751]
.0006	MULTICENTRIC CARPOTARSAL OSTEOLYSIS SYNDROME	MAFB, SER76LEU	[rs730880014]	-	[RCV000023752]
.0007	DUANE RETRACTION SYNDROME 3 WITH DEAFNESS	MAFB, 1-BP DEL, 503A	[rs879255275]	-	[RCV000235061...]
.0008	DUANE RETRACTION SYNDROME 3	MAFB, 1-BP DEL, 440G	[rs879255276]	-	[RCV000235076...]
.0009	DUANE RETRACTION SYNDROME 3	MAFB, 1-BP DEL, 644A	[rs879255277]	-	[RCV000240779...]
.0010	DUANE RETRACTION SYNDROME 3	MAFB, 600-KB DEL	-	-	[RCV000235069]

MAFs protein sequence alignment

(1) Obtain MAFs amino acid sequence

UniProt

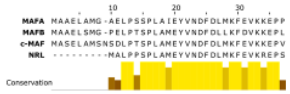
https://www.uniprot.org



(2) Align MAFs amino acid sequence

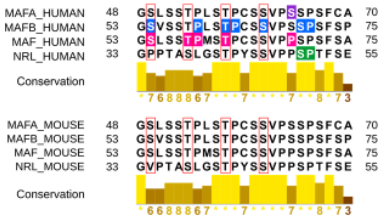
Jalview

http://www.jalview.org/



7

Result: Candidate pathogenic variants in transactivation domain



>>>found one candidate mutation point

Transactivation domain

8

Lab work experience in NTU

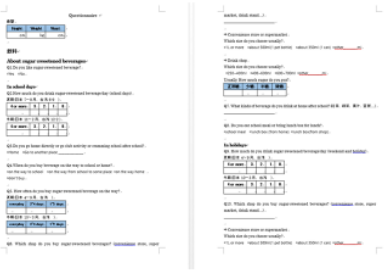
- Preparation of questionnaire about sugar-sweetened beverage intake among children in Taiwan and Japan
- Data collection about school policy and culture related to food in Taiwan, Japan and France

Lifestyle difference between Japanese and Taiwanese kids

Questionnaire

- BMI
- Purchase of SSB on the way to school or home
- SSB consumption at home in holidays
- Unsweetened beverage consumption
- Exercise habits
- School policy

Questionnaire



Additional Lab Work

UT: GABA-enriched melon through CRISPR-Cas (knock-out of GAD)

NTU:

- implication of autophagy mechanism in resistance against TuMV
- implication of an hormone in drosophila reproduction
- analysis of fish oil samples using the coupled system HPLC/MS
- identification of beneficial bacterias in taiwanese food product

Lab work process

- Reach teachers: need to be done early
- Define a project (short one, not easy) or join one already in place
- Participate in lab activities (including seminars)
- At least 2 days need to be allocated to lab work

Logistic part

2018.10.23

University of Tsukuba

筑波大学 University of Tsukuba

- Visa: address registration in the city hall
- School registration: wonderful
- Scholarship: JASSO
- Daily life: thanks to Ms. Wang (Youmei), Ms. Tsubomi and our classmates
  - Medcine: serious language problem
  - Good environment: GIP office and GIP student common spaces

National Taiwan University

國立臺灣大學 National Taiwan University

- Visa: registration in Ministry of Foreign Affairs
- School registration: take time
- Scholarship:
  Taiwanese: GIP-TRIAD scholarship
  Japanese: Japan Student Services Organization (JASSO)
- Daily life: thanks to our classmates
  - Medcine: great
  - Without language problem

University of Bordeaux

université de BORDEAUX

- Visa: apply by students and take long time in France
- School registration: take time, **civil insurance and medical repatriation**
- Scholarship:
  Taiwanese: find by ourselves/ Nouvelle-Aquitaine
  Japanese: find by ourselves/ JASSO
- Daily life: thanks to our classmates
  - Email: missing and languages

Visa

	UT	NTU	UB
Japan		Before: one week After: two weeks	Before: two weeks After: one month
Taiwan	Before: one week After: one day		Before: one month After: one month
France	Before: 2 weeks After: one day	Before: one week After: two weeks	

Registration

	UT	NTU	UB
Japan		2 weeks	2 ~ 4 weeks
Taiwan	One day		2 ~ 4 weeks
France	One day	2 weeks	

Before and after entering

- Organisation
- Flexibility
- Communication / Cooperation
- Levels of course

Cost of living

- UT: 700 USD
- NTU: 300~400 USD
- UB: 800~1000 USD

Thank you for your attention

Mayor of Tsukuba visited Bordeaux

Date: November 9th, 2018

Venue: City hall of Bordeaux, ISVV, BSA

Purpose: To visit wine production sites and research institute in the frame of the Tsukuba wine project

Mr Tatsuo Igarashi, the Mayor of Tsukuba and his colleagues in the Tsukuba wine project have visited Bordeaux with the support of two UT GIP faculty members, Dr Fabien Lombardo and Dr Ling Zheng. During the visit, UB international office organized a lunch with GIP students from UT. Students were encouraged by Mr Igarashi and discussion was fruitful for each other.




Mid-term presentation

On November 27th and 28th, the Mid-term presentation was organized on INRA Green campus using Polycom system for examiners from UT and NTU. Each student has presented his or her progress of the comprehensive report in 10 min, then examiners have given advices and comments to help students to finalize their report. The table below shows the presentation titles, supervisors and examiners.

November 27th 2018

Student's name		**Home university**
Li-Yun Lin		NTU
Comprehensive report title (tentative)		
Comparison and evaluation of anthocyanin contents in grapes of different varieties (in Taiwan, Japan and France) using NIR spectroscopy		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Osamu Oheda &Takuma Genkawa	Suming Chen	P. Petriacq / S. Krisa
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Osamu Oheda	Shu-Chun Teng	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

Student's name		**Home university**
Meng-Ting Yu		NTU
Comprehensive report title (tentative)		
Risk assessment of neonicotinoids residue in teas from Taiwan and Japan		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Yoshito Kumagai /Nakayama Shouji	Chang-Chuan Chan	C. Bennetau
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Yoshito Kumagai	Shu-Chun Teng	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

Student's name		**Home university**
Nobuyuki Akami		UT
Comprehensive report title (tentative)		
Text analysis of evaluation of Japanese food by newspapers		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Ryosuke Ohniwa	Ning-Shin Shaw	Mori/ Rolin
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Masayuki Matsumoto	Shu-Chun Teng	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

Student's name		**Home university**
Romain Albert Marcel Garrigues		UB
Comprehensive report title (tentative)		
Genetic modifications to feed Human and Cure diseases		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Masao Ichikawa	Chau-Ti Ting	M. Hernould / F. Delmas
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Chiaki Matsukura	Chau-Ti Ting(in UT)	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

Student's name		**Home university**
Marie-Dominique Therese Michele Jolivet		UB
Comprehensive report title (tentative)		
Geminiviruses infection of Cassava, a food security crop		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Hiroshi Ezura	Shih-Shun Lin	V. Shurdi
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Hiroshi Ezura	Shu-Chun Teng	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

Student's name		**Home university**
Kimberley Evelyne Massei		UB
Comprehensive report title (tentative)		
Plant metabolite production and their potential health benefits		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Yoshihiro Okabe	TK Li	P. Gallusci
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Yuichi Yamaoka	Shu-Chun Teng	Shurdi/Delmas/Denayrolles/Mori/Pétriacq

November 28th 2018

Student's name		**Home university**
Hsin-Yun Wang		NTU
Comprehensive report title (tentative)		
Clinical study to prevent sarcopenia with food		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Masao Ichikawa	Wei J. Chen	Bennetau/Féart
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Masao Ichikawa	Shu-Chun Teng	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Student's name		**Home university**
Chen-Pang Wang		NTU
Comprehensive report title (tentative)		
How in vitro meat that could decrease CO2 increase can be accepted by the consumers		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Ryosuke Ohniwa	Han-Yi E. Chou	C. Bennetau
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Ryosuke Ohniwa	Shu-Chun Teng	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Student's name		**Home university**
Szu-Chun Yang		NTU
Comprehensive report title (tentative)		
Characterization of microbiome phenotypes to enhance precision medicine		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Takahashi Satoru	TK Li	T. Noël
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Kazuya Morikawa	Shu-Chun Teng	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

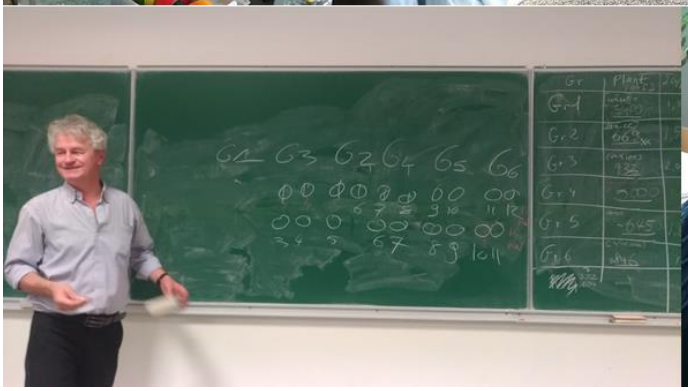
Student's name		**Home university**
Mamiko Mizuno		UT
Comprehensive report title (tentative)		
How to approach various situations of obesity problem in children		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Masao Ichikawa	Chang-Chuan Chan	C. Bennetau/B. Cherifi
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Ryosuke Ohniwa	Shu-Chun Teng	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Student's name		**Home university**
Minagi Uchida		UT
Comprehensive report title (tentative)		
Creating human body journey map of functional molecules		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Ryosuke Ohniwa	Ning-Sing Shaw	C. Bennetau
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Masayuki Matsumoto	Shu-Chun Teng	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Student's name		**Home university**
Emilie Chloé Gericot		UB
Comprehensive report title (tentative)		
Improvement of nutrition through the consumption of Seaweed and Microalgae oil		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Ryosuke Ohniwa	Ning-Sing Shaw	Rolin/Mérillon
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Junichi Peter Abe	Chien-Kuo Lee	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Student's name		**Home university**
Valentin Jacky Marcel Leannec-Rialland		UB
Comprehensive report title (tentative)		
Creating food supplement using fungi based on some interesting chemical substances		
Supervisor in UT	**Supervisor in NTU**	**Supervisor in UB**
Junichi Peter Abe	TK Li	G. Barroso
Examiner in UT	**Examiner in NTU**	**Examiner in UB**
Junichi Peter Abe	Chien-Kuo Lee	Bennetau/Urdaci/Barrosso/Grossiord/Pétriacq

Scenes from the semester



ANNEXES

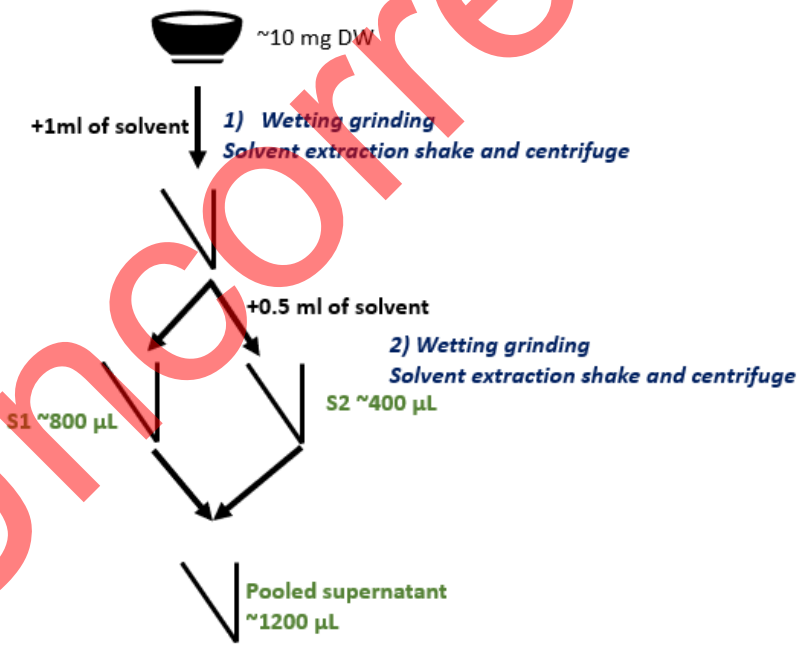
Kimberley MASSEI
Romain GARRIGUES

PRACTICAL COURSE 1: METABOLITE EXTRACTION OCTOBER 24TH 2018

QUESTION 1)

- **Protocol B**: We used Ethanol 98% which less toxic than Methanol (can induce headaches…)
- **Protocol C**: The solvent is methanol.

Differences: between both protocols is the solvent but also, we have to highlight that with robot, the samples are heated and thus, metabolites can be denatured if they are not thermostable. That is the reason why we would prefer the manual extraction protocol (C), with a temperature kept between 4°C and 25°C. Moreover, this protocol allows a finer extraction because it allows to stop the quenching of metabolism at 4°C. (CF 5)).



Finally, we just use the Ethanol 98% as solvent for the 2 protocols to compare the results of them. Ethanol 98% means in 100ml of solution we have 98mL of ethanol and 2mL of water.

QUESTION 2)

Ethanol 98%. If we want to use only ethanol and water, we can also make a gradient solvent by increasing ethanol step by step and reducing water to collect more and more apolar molecules.

QUESTION 3)

We select the Ethanol 98% because it's less toxic for humans. Methanol can be better for some extractions but it's more toxic and can destroy the robot. We used Ethanol 98%, in both extraction techniques, to have the same solvent in the experiments in order to compare it. We can save time with one solvent.

QUESTION 4)

With ethanol 98% we want to extract polar metabolites first (like amino acids, sugars), but because it's an organic solvent, we also can extract apolar (like chlorophyll), organic (like lipids) and hydrophobic compounds. As a conclusion, with ethanol 98% we can get a large coverage of metabolome, we can extract lot less compounds by using methanol because methanol can mainly extract hydrophobic and apolar compounds, but not polar compounds like we could extract with water.

QUESTION 5)

For both of them, we start from fresh plant material that were lyophilized and grinded into a powder. Then 1mL of extraction buffer is added to do a first extraction, centrifuged and supernatant is collected (800microliters). A 2nd extraction is performed with 500microliters of extraction buffer, centrifuged, and supernatant is added to the first collection of supernatants (pooled with the 1st supernatant). Supernatants are vortexed, centrifuged and split into aliquots and put under complete dryness. Finally, samples are stored at -80°C.

Major discrepancies:

- Temperature, as explained previously, in the robot we will heat the sample. Contrarily, in the manual double extraction we are in ice (~4°C).
- Solvent: different range of metabolites are selected.
- Precision error (by experimenter), we have more mistakes by using manual extraction than by using the robot.
- Save time with the robot.
- Different concentrations of solvent compared to manual extraction.

QUESTION 6)

About qualitative efficiency, as said in 1), we can get more diversity of compounds with ethanol 98%. We can get more qualitative results with the robot extraction, and finally we will get a better coverage of metabolome. We have several types of concentrations of ethanol with the robot that's why it has a better coverage.

QUESTION 7)

To get a better quantitative result we prefer to use manual extraction, because we repeat with the same concentration the extraction twice. Compare to the robot extraction, we do a second extraction with a different concentration, we can get other compounds (CF 6)).

QUESTION 8)

The blank will permit us also to avoid some back noise in our results and be closer to Reality. Maybe 100% of water some compound (and some contamination) will already been extracted so we have to subtract them (= Back noise).

ANNEX II

University of Bordeaux

Report Biotechnology and Field to lab

TAGL1 and Mycotoxin production – a story between tomato and fusarium

OUTLINE :

Romain |Brice |Jamie

Summary:

Because of the increasing demography we, scientist, need to find solution to feed humans and health. We could play on relation between Fusarium and plants. Fusarium graminearum, for example, causes some diseases on plants (Ear rot) and human (digestive diseases) by mycotoxin production.

This report tends to find a possible link between mycotoxins like deoxynivalenol (and its family) and the gene TAGL1(TOMATO AGAMOUS-LIKE 1), in the Tomato model. TAGL1 is a transcription factor and impact a lot of chemical process in the plant.

We used PCR, qPCR mini and maxiprep as our method to do those experiments and some kit for mini prep, purification and golden gate (from the genome editing).

Our knowledge in microbiology and biotechnology permit us to say that the CHO has an inhibitor effect on fungi (at 5mM), our CRISPR/CAS9 mutants have the TAGL1 gene mutated. We can select some plant to have deeper studies and continue in the perspective to create/select interesting traits and vegetal materials.

So, we could improve the food production and play on the human's Health by increasing the chlorogenic acid production in plant. It could inhibit the fungi growth and reduce the mycotoxin production.

General background and Aims

Microbiology

The *Fusarium graminearum* is **anamorph** (asexual reproduction). The ascomycete attacks some cereals with small grains like barley, wheat, rice, triticale… The maize has a resistance to Fusarium species by a huge production of chlorogenic acid (CHLO). It could be an interesting molecule to study.

Mycotoxins can induce some diseases like Ear roots, which influences maize yield and grain quality worldwide. Those mycotoxins are **type B of trichothenes (TCTB)** and known as: 15-acetyl-deoxynivalenol (15-ADON), nivalenol (NIV), 3-acetyl-deoxynivalenol (3-ADON) and deoxynivalenol (DON). (Duan, C., & al. 2016). You can see the molecular structure of the DON in the Figure 1.

In this study we will focus on *F. graminearum* and *F. tricinctum*, which are two main important strain. Our hypothesis on the microbiologic part is that the CHLO can block, or inhibit, the conidia germination, mycotoxin production and the growing of fusarium.

F. graminearum produce DON/15-ADON in majority.

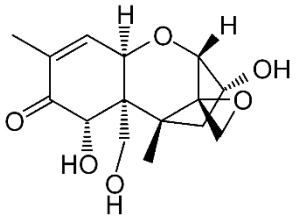


Figure 1: CHO-Chlorogenic acid

Biotechnology

The TAGL1 gene is our gene of interest, it's in the chromosome 7 in the tomato (*Solanum lycopersicum*). TAGL1 is a transcription factor involved in many physiological and biochemical processes of plants, especially in fruit ripening. This gene is a MAD-box gene. When we mute it, the fruit look smaller, the pericarp is tinnier, but the cuticle is bigger, and the metabolism of some compound are altered (Increasing of malate, citrate, glutamate, lactate, decreasing of Sugars, isoprenoids). The TAGL1 mutated in Arabidopsis thaliana and tomato show that the ethylene production is reduced. TAGL1 is important in the ripening of the tomato fruit. (E.J. Zabaleta and al (poster); Koshiro and al, 2015; Jianling Zhang and al. 2018)

OBJECTIVES: Goals of those experiments are to mutate by genome editing (CRISPR/CAS9 by Goldengate) the gene TAGL1 and understand principles of this "new technology", but also to compare the growth, mycotoxin production and F*usarium graminearum* and *tricinctum* germination on several media with the presence (or not) of chlorogenic acid which is a supposed chemical to protect plants.

Detail of implementation

Approaches (methods, material …)

Microbiology

Objectives: analyses the effect of CHO on Fusarium graminearum and tricinctum 's growth, germination and mycotoxins production.

Biological materials are:

Fungi matrix		Vegetal matrix		
F. graminearum	F. tricinctum	Triticale	Maize (*from Monsanto*)	Wheat

We will study the impact of CHO in Growth, mycotoxin production and germination.

Growth: To prove that CHO inhibit mycotoxin we studied the growth (on petri dishes with 2 media) in several concentration (0 to 10 mM of CHO with a control 0 and ethanol). We will use two media for the fusarium growth, PDA (Potato extract + Dextrose and Agar) and MS (Glucose, $(NH_4)SO_4$, trace element and salts). For the starters we will use conidia (spores) and mycelium. It permits us to compare the impact of the media and the impact of the starter link to the CHO.

Mycotoxin production: We need also to see the mycotoxin production by using DNA extract of our biological material (miniprep for fungi matrix (**0,2g of DNA**) and maxiprep for vegetal matrix (**5g of DNA**).

To analyses the concentration of DNA we used the FLUOROSTAR OPTIMAL OMEGA and we get some spectra. With those spectra we could know the concentration of our nucleic acids in our samples and select the most important amount.

We used **20ng** of DNA to do a qPCR. With the qpcr we could analyses the specificity of primers and see if our cereals are infected by plants. We used specific primers for F. graminearum (*FgrH3* for histone 3 & *i10* specific for COX1 in mitochondrial DNA) and same for F.

tricinctum (*esi/n1* for the nuclear gene and *NAD5* for the mitochondrial DNA).

Germination: For the germination, we could observe spores with Colton blue (germination staining). Because of the short time we had we couldn't use this method.

The *next table* shows our experiment protocol in its globality. For the MS media we don't used the 2mM, which was not efficient.

F.spp	Medium	Starter	CHO concentration					
			0mM	0+10 mL of ethanol	1mM	2mM	5mM	10mM
F.graminearum	PDA	Conidia						
		Mycelium						
	MS	Conidia						
		Mycelium						
F. tricintum	PDA	Conidia						
		Mycelium						
	MS	Conidia						
		Mycelium						

Biotechnology

Objectives: The objective of the manipulation is to knock-out a plant gene by using Cas9 and RNA guide. Then analysis the result by bioinformatic tools.

So, the first step was to construct a plasmid Level1: In order to assemble the different part of the chosen construction, a Goldengate technic were performed using a commercial Goldengate kit and the following: the plasmid level 0 (pU6) is the plasmid chosen for the construction (with the specific restriction site of Bsa1 and lacZ for the selection). Add to this plasmid there is two different couple of guides, sgRNA1-sgRNA3 first pair and sgRNA2-sgRNA4 the second pairs. Then plasmids were grown on selection media for the different couples of guides by using the 3 different phenotypes possible: first blue colony = the construction of interest wasn't insert, second little white colony = the lacZ is cut but the insertion wasn't correct and third with big colony = it succeeds, and the plasmid contain our guides. A PCR were performed on the third one in order to verify if we really have the level 1 plasmid.

Construction of the level2 plasmid for the transformation of *solanum lycopersicum*: the level 2 plasmid is the plasmid with the Cas9 (NB: this Cas9 is specific for *solanum lycopersicum*), so it's the plasmid which could enter the system. NB: the level 2 plasmid also contain the kanamycin resistance cassettes for the next selection step. So, the construction of the level 2 plasmid uses the Bpi1 restriction to cut the plasmid, insert the Cas9 before the pU6 and the sgRNA because the restriction site is bordering the pU6 and the sgRNA previously insert. This time the selection was made on a LB media containing IPTG and carbenicillin to select plasmid with the construction of interest which will correspond to the orange colony. Then level 2 plasmids were inserted (by electroporation) inside *Agrobacterium tumefaciens* for the transformation of *solanum lycopersicum* cotyledons (NB: cotyledons were

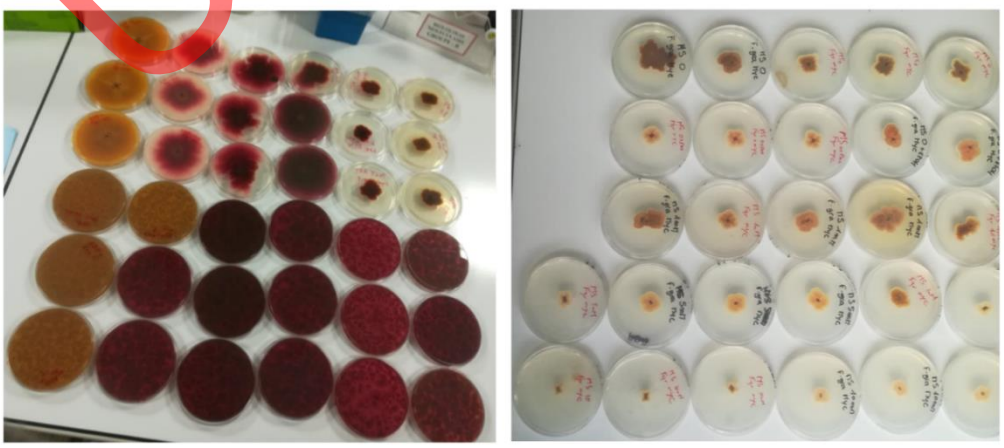
cut and pretreated on a preculture media containing different hormones and Acetosyringone). After this cotyledon transformation multiple steps of media change were performed in order to form callus and regenerate an entire plant (F1). Self-fecundation, seed harvest and growth were done for 3 generation. (NB: Kanamycin selection but Kanamycin selection isn't enough to select our plant of interest because resistance against kanamycin could be just a matter of mutation in some plant so for the first generation, plant which didn't have the mutation of interest won't be viable and won't have leaves and these characteristics will allow us to select our plants.) For each generation (NB: remember that at the third generation the Cas9 will be already discard but the mutation will be transferring the next generation), DNA purification is required for the sequencing and the analysis (NB: comparison to the WVAA106 as a wild type)

Purification of the DNA (Purification kit), this step could be done on tomato leaves or cotyledons: (NB all step must be realized on the transformed plant and also on the control in order to make difference between mistake during PCR and our mutation). It must be noticed that Ethanol and salt were used to all proteins, and RNA which may provide contamination. PCR and Electrophoresis were also done to verify if we have the right sequence (NB: for the PCR, two different PCR were performed, so 2 different primers were used, the first were the primers for CAC which something ubiquitous so it's the positive control and also a charge controllers and the second couple of primers were for the gene of interest) . The analysis of the genome sequencing was done by bioinformatic tools like benchling.

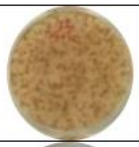
Achievement (results, consideration…)

Microbiology

From the agar plates we can see that the as the dosage of CHO increase, there are some inhibition effects for the growth of the fungus. However, some plates are contaminated by other fungus, which make the data have bias. When we look into the red pigments, which is a secondary metabolism, that produced by *F. tricintum and F.graminearum,* we can see that CHO might affect the pathway of red pigment producing. Aging and inhibited fugus present an orange tone color, compare with the control one, red to dark red color. When it comes to the germination test, CHO also shows the inhibition ability for fungus germination. The higher concentration CHO is, the smaller size the fugus is.



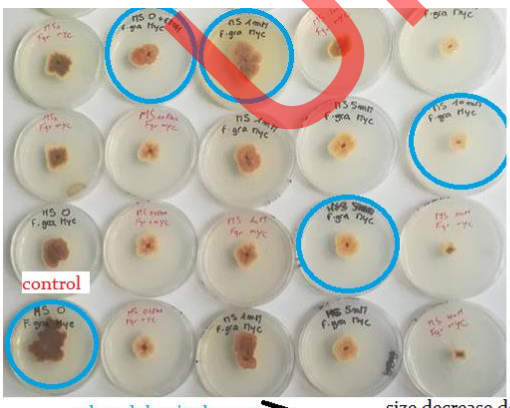
▲ (Left) The experiment result of fungus growth. (right) The experiment result for germination. Both results show CHO has inhibition ability and the depending on the dosages.

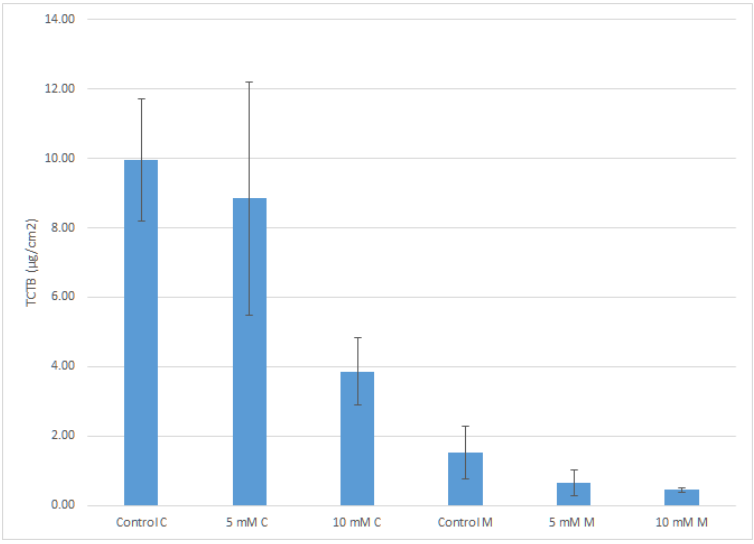
	Medium	Starter	CHO concentration				
			0mM	0+10 mL of ethanol	1mM	5mM	10mM
F.graminearum	MS	Conidia					
		Mycelium					

This table shows the effect of CHO with several conditions: concentration of CHO (0 to 10mM), starter (conidia or mycelium), medium (or MS) and stain of fungi (F. graminearum). We only select them because it's easier to see the effect and it was less ambiguous to analyses. As we can see, With the conidia, the effect starts to be visible at 5mM (we have less colonies) but it's more efficient at 10mM. It's starting to be pink (coral) because of some oxidative products. When we start by a mycelium, we can observe that at 5mM the effect seems to be efficient to reduce (more than half) the size of mycelium growth. At 10mM it looks like absent. The media is good for the development as we can see at 0mM. The ethanol doesn't influence the growth even if the color of mycelial colonies looks less brown. CHO looks like an inhibitor of mycelial and conidial growth, depending on the concentration.

In this experiment we use Ethanol to dilute CHO, thus, we have one group use ethanol only as control.in germination and fugus growth test. From the results, Ethanol doesn't have stong effect on fugus. In these two experiment CHO shows the inhibition ability for *F. tricintum and F.graminearum.*

After discussing about the phenotype of fugus, we want to know how much mycotoxin the fugus produce and whether the CHO can inhibit the production of mycotoxin or not. We analysis the mycotoxin concentration in the agar, the result shows that when we increase the concentration of CHO, the production of mycotoxin will decrease. From this result, we can learn that CHO plays a role in effecting the mycotoxin production in *F. tricintum and F.graminearum.*





We use qPCR to know whether our samples have Fungi contamination or not. We use specific primer to detect the gene from *F. tricintum and F.graminearum.* From the cycle number we can see that there might have some sample be contaminated by fungus or artificial mistakes.

From this figure we can see that as the sample concentration decreases, the cycle numbers increase. This means that the dilution is correct, and the samples aren't contaminated by fungus.

The cycle number in these two-figure show that there might have some artificial mistakes on dilution or sample adding. The data is not stable and don't have regulation.

Well	Fluor	Target	Content	Sample	Biological Set Name	Cq
A01	SYBR	Eysin1	Unkn-01	maize	20	19.46
A02	SYBR	Eysin1	Unkn-01	maize	20	19.62
A03	SYBR	Eysin1	Unkn	maize	2	22.50
A04	SYBR	Eysin1	Unkn	maize	2	23.25
A05	SYBR	Eysin1	Unkn-02	maize	0.2	25.38
A06	SYBR	Eysin1	Unkn-02	maize	0.2	26.20
A07	SYBR	Eysin1	Unkn	maize	0.02	30.18
A08	SYBR	Eysin1	Unkn	maize	0.02	30.16
A09	SYBR	Eysin1	Unkn-03	maize	0.002	39.20
A10	SYBR	Eysin1	Unkn	maize	0.002	33.34
A11	SYBR	Eysin1	Unkn-04	maize	0	34.80
A12	SYBR	Eysin1	Unkn-04	maize	0	34.05

Well	Fluor	Target	Content	Sample	Biological Set Name	Cq
E01	SYBR	Eysin1	Unkn	Wheat	20	19.14
E02	SYBR	Eysin1	Unkn	Wheat	20	27.02
E03	SYBR	Eysin1	Unkn-17	Wheat	2	25.66
E04	SYBR	Eysin1	Unkn	Wheat	2	23.15
E05	SYBR	Eysin1	Unkn-18	Wheat	0.2	27.21
E06	SYBR	Eysin1	Unkn-18	Wheat	0.2	26.56
E07	SYBR	Eysin1	Unkn	Wheat	0.02	29.79
E08	SYBR	Eysin1	Unkn	Wheat	0.02	28.37
E09	SYBR	Eysin1	Unkn-19	Wheat	0.002	32.33
E10	SYBR	Eysin1	Unkn	Wheat	0.002	30.25
E11	SYBR	Eysin1	Unkn-20	Wheat	0	31.76
E12	SYBR	Eysin1	Unkn-20	Wheat	0	29.47

Well	Fluor	Target	Content	Sample	Biological Set Name	Cq
F01	SYBR	i10	Unkn	Wheat	20	17.59
F02	SYBR	i10	Unkn	Wheat	20	17.02
F03	SYBR	i10	Unkn-21	Wheat	2	20.16
F04	SYBR	i10	Unkn	Wheat	2	20.25
F05	SYBR	i10	Unkn-22	Wheat	0.2	22.31
F06	SYBR	i10	Unkn-22	Wheat	0.2	22.28
F07	SYBR	i10	Unkn	Wheat	0.02	23.02
F08	SYBR	i10	Unkn	Wheat	0.02	23.01
F09	SYBR	i10	Unkn-23	Wheat	0.002	22.66
F10	SYBR	i10	Unkn	Wheat	0.002	22.77
F11	SYBR	i10	Unkn-24	Wheat	0	22.69
F12	SYBR	i10	Unkn-24	Wheat	0	22.73

Biotechnology

The Figure 2, show the PCR result of the plant 24 G2 superman. As we can see we have the presence of the primers inside the plant because we have the lines. The control prove that the PCR works.

Figure 2: PCR of Plant 24 G2 superman

If we look the result shown on the figure 3 (result of the bioinformatic tools benchling in the genome sequencing) and compare it with the template, we can see that we have difference to the template, so we can say that we may have a mutation.

To determine if it's a real mutation, we have to compare it to the result of the sequencing of Wild type (WVA106) because the parameters were similar for the PCR, so if it's a real mutation and not just a matter of mistake during the PCR, the wild type sequence and the mutant sequence should be different at the location of the mutation. And it's the case so, the mutation is real. Next, we can also say that we have homologous allele because if zoom on nucleotide and by the force the information, we can't see superposition of nucleotide information, so we can conclude that we got the same allele on the region of the mutation. Last, the ten first nucleotides are not changed, and we know that these ten first nucleotide are important in order to know if the cas9 goes away (here the cas9 is detached because it's, but we got the mutation, so the information may be transmitted to the next generation). To conclude as, you can see in the Figure 3, the guide 1 is all deleted, and we

have a stop codon at the end of the guide 2. The protein will be small. Normally, with this kind of plant, we will not have the expression of the functional protein from the gene TAGL1. It's a good candidate to study the TAGL1 effect with fungi and the concentration of some compound like ethylene, malate, sugars… and select its descendances, after self-crossing to obtain homozygous, to continue experiences and maybe sell it to companies (*depending of countries for laws and policies*).

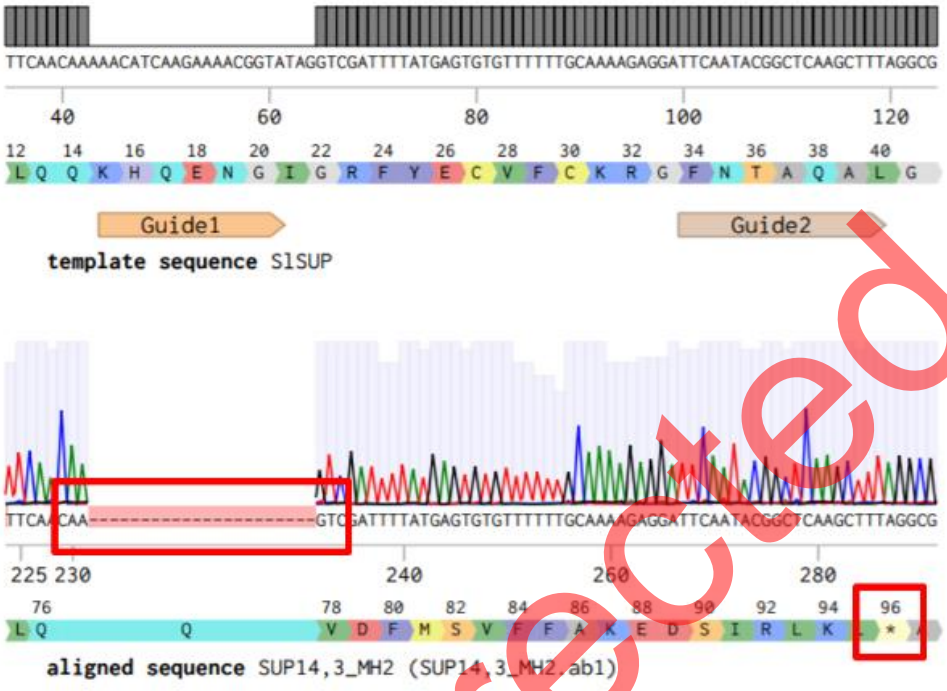


Figure 3: https://benchling.com -> analyse of the SUP14,3

General consideration and outlook

CHO seems to have an effect **at 5mM**. As we could see on the result of CHO effect on the growth, when CHO start to be higher the fungi reduce its growth and size. It means that CHO has an inhibitor effect on the growth development of fungi. It also inhibits the production of mycotoxin and pigments. When it comes to the qPCR results, double confirmation needed. We need more data to identify it's contaminated by fungi or artificial mistakes. The qPCR data are good materials for us to know whether samples are contaminated or not. The design for specific primers is important for precious detection.

With the result from https://benchling.com website (Figure 3), we can select the plant 14.3 as a good candidate to study TAGL1 and go deeper in the analysis. It could be one plant with a little protein, after translation of the gene mutated, because we have a stop codon at the beginning of the sequence. We can hope that the protein will be recognizing to be degraded.

We know that when we mutated TAGL1 the citrate, glutamate, malate and lactate are increasing. Those compounds are involved in a pathway link with the CHO production. Moreover, when we mutate the TAGL1 gene, the ethylene production is decreasing. We know that the F. graminearum use ethylene signaling to

colonize plant. One perspective could be to analyses the ***concentration of the ethylene*** in plant (WT and mutated) infected and non-infected by F. graminearum. We can also check the efficiency of the plant to resist against fusarium but also the amount of mycotoxin produced by those fungi.

We can also study the CHO effect on Fusarium germination, with Colton blue.

We could see in this paper that the CHO impact the growth of F. graminearum. It could permit us to manage some plants and area of interest where this fungus is present to decrease the loose of foodstuff.

If we could increase the production of CHO (~5mM, where we saw an effect) in the plant, the protection could be enough efficient to be protect against ear roots for example. We could explain it, and select some interesting cereals or tomato, to some companies like Monsanto. We used maize seeds from this company for the study. So, we could permit them, and other food industry, to improve the resistance of plants against fusarium and **increase the foodstuff and feed human**.

Moreover, we can also play on the **Health** by decreasing mycotoxin in animal/human nutrients, which cause liver diseases (aflatoxin), chondrocyte alteration (NIV), gastroenteritis and chronic disease in humans (DON) …

So, with this study we have a **medical, environmental, economic and nutritional impact** on the plant development and use.

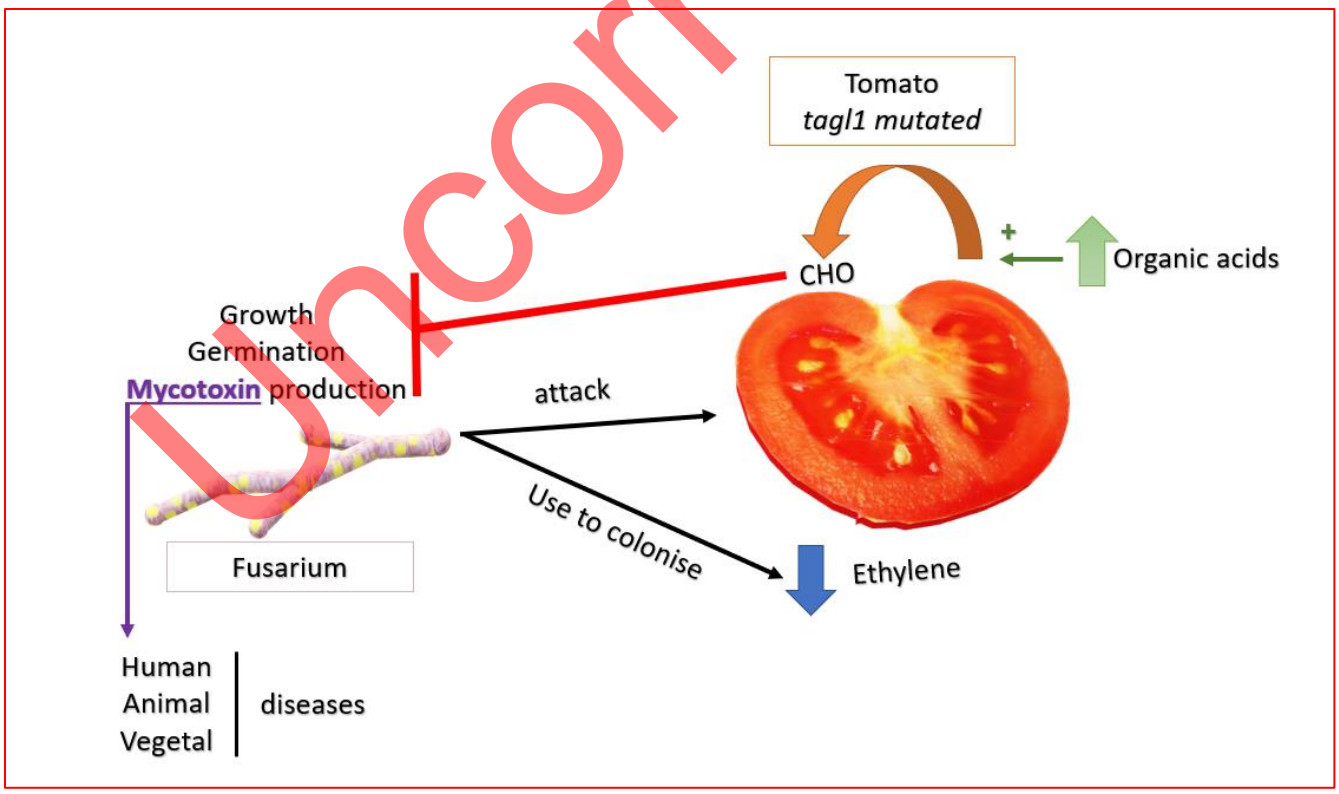


Figure 4: General schema of the conclusion and outlook

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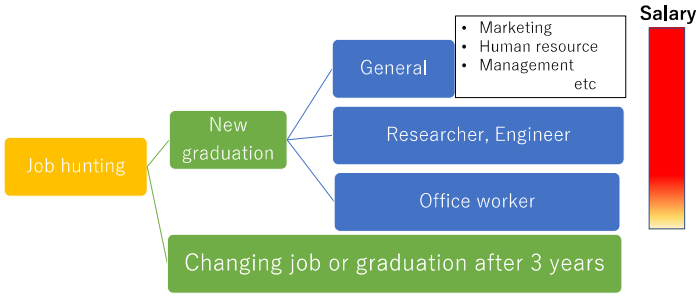
- https://www.uniprot.org/uniprot/Q8H281
- https://benchling.com
- https://synbio.tsl.ac/uk/

ANNEX III

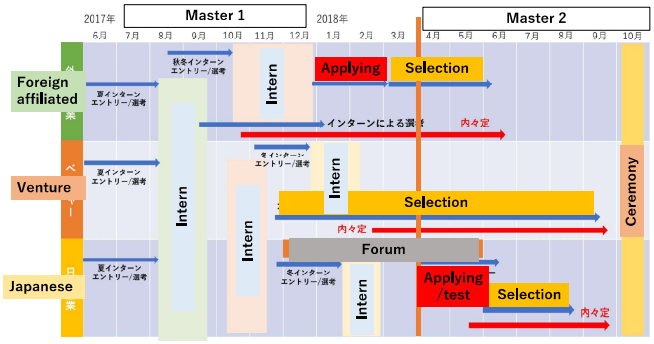
Job hunting seminar

Nobuyuki AKAMI
11/10/2018

Job type for recruitment in Japan



Schedule of job hunting in Japan



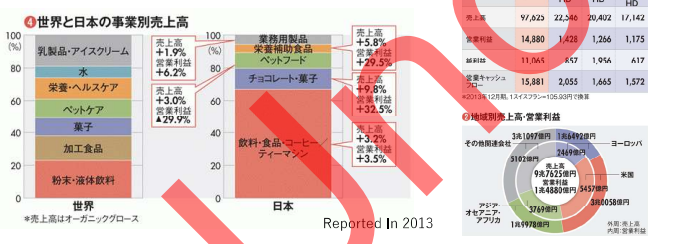
Entry Sheet (CV) in Japan

- Academic background
- Research project
- Club activity
- Part time job
- Certification / Score
- Hobby
- Strength of myself
- Motivation
- Activities which you spent the most time

etc…

Nestle Japan

Established	Sales	Employees	Field
In 1913	900billion JPY (in the world)	2500 (in 2016)	Foods Beverages Pet foods



Job type in Nestle

General
- Sales
- Marketing
- Supply chain
- Financial
- Promotion
- Human resource

Technical
- Development
- Packaging
- Manufacturing
- Quality checking
- Production management

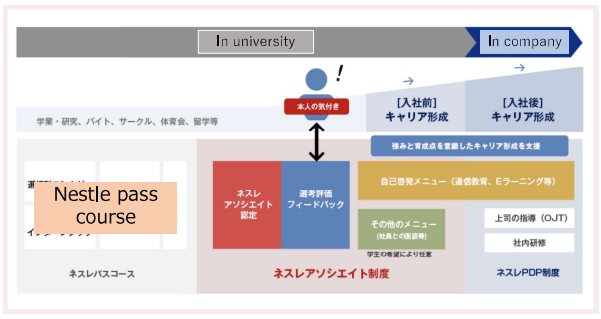
Job hunting in Nestle Japan

Nestle pass course

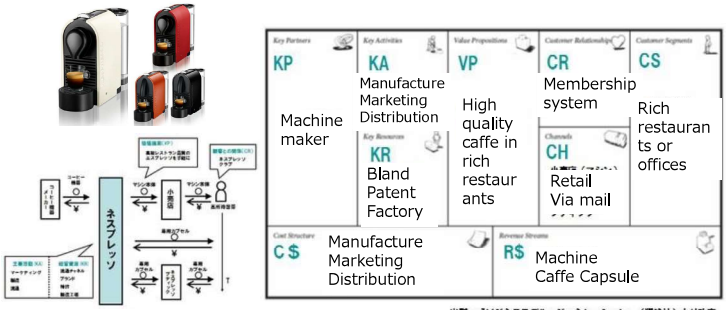
Step.01	Step.02	Step.03	Step.04	Step.05
エントリー	ネスレパス付与	ネスレチャレンジ	面談	ネスレアソシエイト認定
Entry	Getting pass	2days work	Interview	Getting job

3 times/year

After getting job



Business model of Nestle



出所：『ビジネスモデル・ジェネレーション』（翔泳社）より改変

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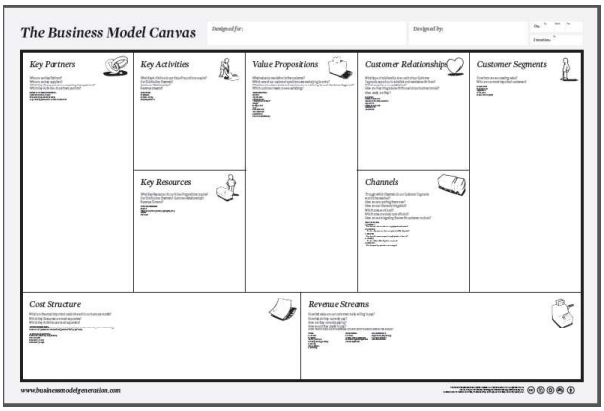
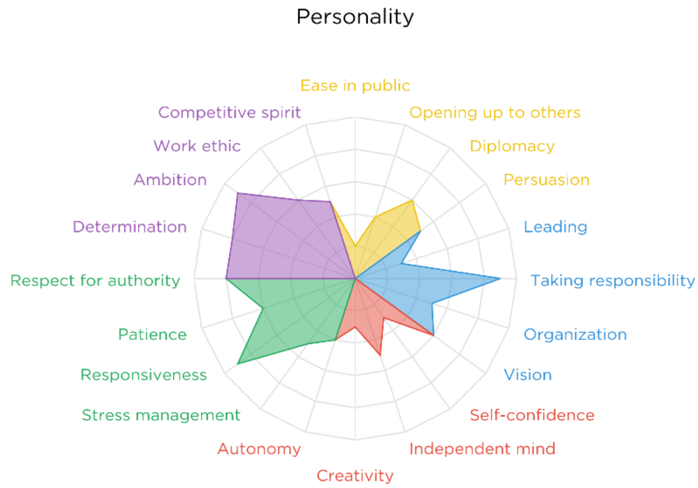
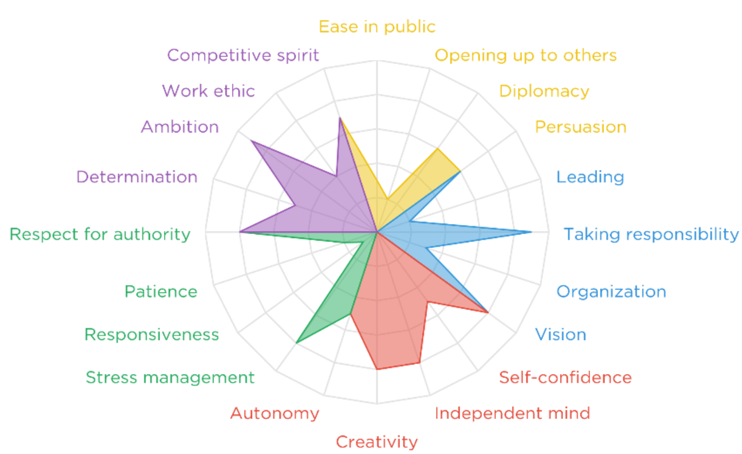


Thank you for your attention

ANNEX III

Personality analysis using “talentoday”





talentoday

Discover what makes you unique on www.talentoday.com

AnonymousMediator

THE MEDIATOR

Code:	INFP-A
Role:	Diplomat
Strategy:	Confident Individualism

MIND

This trait determines how we interact with our environment.

46% EXTRAVERTED | INTROVERTED 54%

Introverted individuals prefer solitary activities and get exhausted by social interaction. They tend to be quite sensitive to external stimulation (e.g. sound, sight or smell) in general. Read more

ENERGY

This trait shows where we direct our mental energy.

70% INTUITIVE | OBSERVANT 30%

Intuitive individuals are very imaginative, open-minded and curious. They prefer novelty over stability and focus on hidden meanings and future possibilities. Read more

NATURE

This trait determines how we make decisions and cope with emotions.

47% THINKING | FEELING 53%

Feeling individuals are sensitive and emotionally expressive. They are more empathic and less competitive than Thinking types, and focus on social harmony and cooperation. Read more

TACTICS

This trait reflects our approach to work, planning and decision-making.

42% JUDGING | PROSPECTING 58%

Prospecting individuals are very good at improvising and spotting opportunities. They tend to be flexible, relaxed nonconformists who prefer keeping their options open. Read more

IDENTITY

This trait underpins all others, showing how confident we are in our abilities and decisions.

54% ASSERTIVE | TURBULENT 46%

Assertive individuals are self-assured, even-tempered and resistant to stress. They refuse to worry too much and do not push themselves too hard when it comes to achieving goals. Read more

"THE ADVOCATE" (INFJ-A)

DIPLOMAT

CONFIDENT INDIVIDUALISM

33% INTROVERTED 67%

62% INTUITIVE 38%

29% FEELING 71%

53% JUDGING 47%

56% ASSERTIVE 44%

ANNEX IV

IAPB report

- MODEL CITRUS –

Arissa|Romain | IAPB | 14/12/18

Summary:

Introduction -Presentation of the Biology of the species and mating system

Citrus is genus in angiosperms and shrubs in the *Sapindales* order and the *Rutaceae* family. Some of the most famous cops are: Orange, lemons, mandarin, pomelo and limes. They are a lot of hybrids like:

- *Citrus* × *aurantiifolia* – Key lime
- *Citrus* × *aurantium* – Bitter orange
- *Citrus* × *latifolia* – Persian lime
- *Citrus* × *limon* – Lemon
- *Citrus* × *limonia* – Rangpur
- *Citrus* × *paradisi* – Grapefruit
- *Citrus* × *sinensis* – Sweet orange
- *Citrus* × *tangerina* – Tangerine

This family of fruits comes from the subtropical area of Asia, but also are present in the Mediterranean basin.

Citrus plants come from a common ancestor (~15 million years ago), two groups were formed (~7 million years ago) the citrus genus and the ancestors of the *Trifoliate orange* (a primitive hybrid). With the analysis of chloroplasts DNA. As you can see in the Figure 1: origin of the citrus species), scientist determined that the three-original species in the citrus genus came from Himalayas, Yunnan (China) and Myanmar. (Wu et al., 2018)

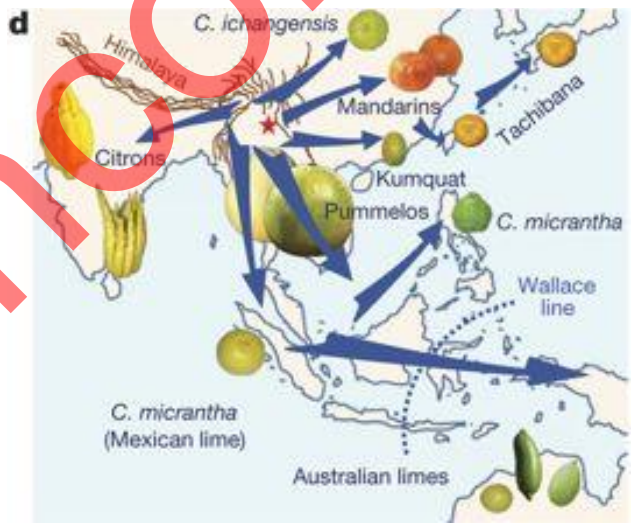


Figure 1: origin of the citrus species

Genetic diversity

The **Erreur ! Source du renvoi introuvable.** shows us genetic data from https://www.citrusgenomedb.org. if we go deeper in the gene part, we can find all knowing genomes of citrus family like *Atlantia buxofolia* (Figure 2: Atalantia buxifolia) genome which contain 28412 genes and 65499 mRNA.

Figure 2: Atalantia buxifolia

DATA OVERVIEW	
Genes	243 066 genes and 448 144 mRNAs
Genomes	
Germplasm	1 426 germplasm
Maps	70 maps
Markers	48 154 markers
Phenotypes	23 070 phenotypic measurements, 38 traits descriptors
Publications	4 045
QTL/MTL	579 QTLs
	0 MTLs
	212 agronomics traits
Species	67
Transcripts	

In the genome part we can find all genome present in the website if we select *Atalantia buxifolia* genome, as an example we will have more information about it.

Atalantia buxifolia genome v1.0

Overview
Properties
Download
JBrowse
BLAST

Overview

Analysis Name	Atalantia buxifolia genome v1.0
Method	WGS sequencing, Illumina (Assembly with SOAPdenovo and QUAKE)
Source	Huazhong Ag. Univ.
Date performed	2017-04-10

About the assembly

For this genome, please cite Wang et al, Genomic analyses of primitive, wild and cultivated citrus provide insights into asexual reproduction. This data was downloaded from the *Citrus sinensis* Annotation Project website, please download the raw data from the project website. Please see the links to the left to view the genome in JBrowse.

Size of assembled scaffolds	316 Mb
Number of scaffolds (>300 bp)	25,600
Scaffold N50	1,073,988 bp
Predicted gene models	28,420

Figure 3: Atalantica buxifolia genome data

In this website we can have information also about germplasm for example Figure 4: germplasms, for the *Citrus aurantifolia* we have 10 germplasm, 8 from cultivar and 2 from breeding research. This information could be interesting in some experiment, like breeding selection to select a specific trait not already done.

⊟ Citrus aurantifolia : 10

Germplasm Type	Number of germplasm
cultivar	8
breeding_research_material	2

Figure 4: germplasms

We can also have information about previous mapping already done and also some markers in the genome by:

- PCR primers;
- SNP;
- SSR;
- InDel;
- Genetic markers;
- Gene markers;
- AFLP;
- CAPS;
- RAPD;
- ...

In this general overview we can also get information about phenotypes, QTL/MTL, number of species present in this database, transcripts but also number of publications for each *Citrus*.

The genetic diversity is also expressed, of course, by the number of species due to crossing to obtain specific traits.

Another way to have information about the genetic diversity is use Chloroplast mapping.

GENETIC MAPPING FROM CHLOROPLAST_EXAMPLE OF THE *C. SINENSIS:*

Chloroplast is an important organelle. It is dynamic and the "house" of the photosynthetic apparatus but also production of starch, some amino-acids, lipids... It is a colorful pigment. It contains its own DNA that's why we can do genetic mapping. In this part we are going to use the *Citrus sinensis*, as an example. (Figure 5: Chloroplast sequence)

In this Citrus sinensis, the Chloroplast nucleic sequence is around 160 kbp (in length) and contains 133 genes (89 protein-coding, 4 rRNAs and 30 distinct tRNAs).

Those analyses could help for the phylogenetic part, also. (Bausher et al., 2006)

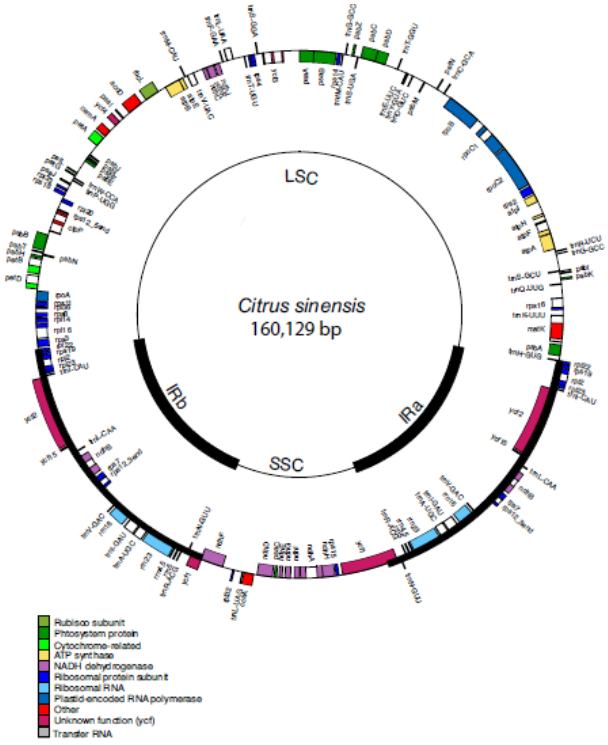


Figure 5: Chloroplast sequence

Use of the species

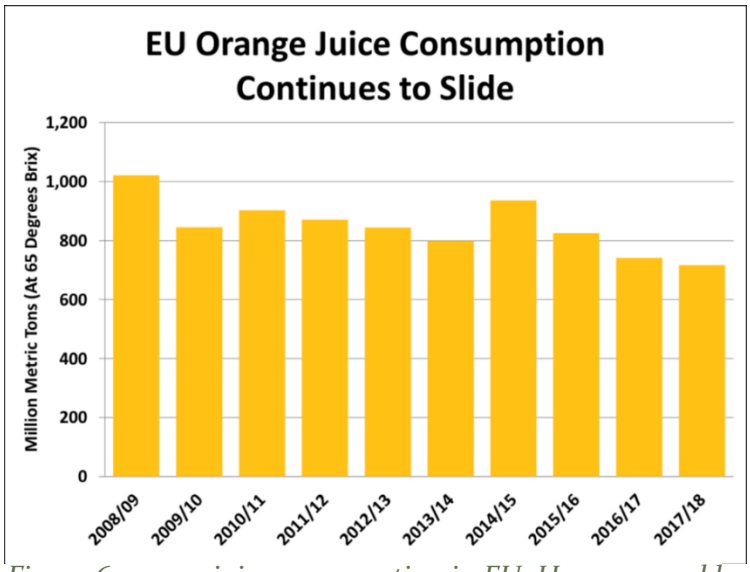


Figure 6:orange juice consumption in EU. Here we would like to describe some common types of citrus for fresh consuming in Taiwan.

Global orange production for 2017 to 2018 is forecast to tumble 6.0 million metric tons from the previous year to 47.8 million as unfavorable weather leads to smaller crops in Brazil and the United States. Similarly, fruit for processing is expected to fall, with orange juice production forecast down nearly 25 percent to 1.6 million tons (65 degrees brix) on the production slide in Brazil and the United States. Fresh exports are relatively unchanged while lower supplies are expected to affect processing oranges. In sum, fresh citrus is the largest use of citrus following by the juice industry. ***Figure 6*** also show the fresh juice consumption in European, In USDA 2018 report, although the production in the European union has been reduce 8 percent to 107,000 tons because of climate change, however EU still is the top one orange juice consumer. (USDA,2018)

Citrus is the most widely distributed fruit tree in Taiwan with the highest yield and the highest value. It is cultivated with many kinds of citrus, including ponkan, kumquat, orange, pea, mandarin, white pomelo, lemon, and pear. Grapefruit, kumquat, groceries, lime, minnie citrus, evening orange, navel orange, etc. The national cultivation area is about 26,210 hectares, ponkan(*Citrus reticulata* Blanco) is the largest cultivate species which is 5,572 hectares, 20% of total cultivation area. The harvest time of Ponkan is from October. (Chen and Huang, 2016)

Figure 7: Ponkon from Arissa's farm in Taiwan

Second largest is Citrus sinensis, 5,244hector, pomelo is following as 5,046 hectors. In my home farm, Ponken is 1.4 hector of 4 hectors, sweet orange is 0.3 hector, Tonkon is 2.3 hector, the category of farming is similar as following table.

Table 1.Citrus acreage and production in Taiwan 2016

Species	Planting area (ha)	Harvest area (ha)	Yield per hectare (ha)	Total production metric tons (mt)
Ponkon	5,572	5,572	19,219	107,086
Tonkon	3,175	3,146	16,505	51,924
Wendan pomelo	4,286	4,221	14,644	61,811
White pomelo	760	755	14,296	10,790
Sweet orange	5,244	5,240	25,065	131,329
Lemon	2,790	2,721	13,337	36,289
Others	4,383	4,343		63,408

This table shows that popular species use of citrus in Taiwan

Traits to improve for the future and why

Since breeding strategy is complicated in citrus, here we would like to discuss about Honey Murcott as an improvement example.

Scientific name: Citrus reticulate Blanco × C. sinensis Osbeck
English name: Honey murcott

Figure 8:Honey Murcott

Figure 10: Murcott after sunburn

Figure 9 : Murcott endangered by Scirtothrips dorsalis

(1) SOURCE

This variety is presumed to be the world's citrus master Swingerin 1913 in Florida, orange (Tangor) selected from the hybrid of broad-skin and orange, due to their parents the logo is lost, so it is impossible to verify the name of the parent. In 1922, it was first propagated by Charles Murcott Smith. Then Charles merchants spawned a small number of named Honey murcott. After 1944, another Smith Family in Florida began commercial production and was named Smith Tangerine. In recent years, many countries around the world, such as the United States, Japan, Australia, and Brazil, have been cultivated and produced, called Honey tangerine. A retired professor of the Department of Horticulture, National Taiwan University, was introduced murcott. In the 1960s from Florida and transliterated to take its "lush valley"-Maogu.

(2) PLANT CHARACTERISTICS

The plants are medium-sized, vigorously growing, the trees form clumps, the branches are long, and the erect tends to grow stronger; the leaves are small to medium-sized, wide lanceolate, leafy blunt serrated, slightly wavy. Flowering in mid-March, it has long flowering period, the flower is medium to small, and white color. It matures from late January to mid-February of the next year. The fruit is about 150-200 grams. The fruit stalk is small, the skin is thin and smooth, yellow-orange, and it is easier to peel from the fruit stalk. The flesh is soft and orange. The soluble solids can reach 14~15 ° Brix and the acidity is 0.6~0.8%. The flavor is thick and are able to resist for long shelf life and transportation. The seeds are small and large, with an average of 12 to 20 capsules. There are phenomena of the next year.

It has high yield production, the leaves are yellow and premature in the late growth stage, and the branches are broken or even the whole tree is degraded. Grafting with the acid orange anvil is

good, but the grafting affinity with the clam shell, orange, and pomelo is slightly worse, especially after 10 years grafting. If the excess is more likely, it will prematurely decay.

In the high production year, it is easy to drop a large number of fruit and cracked fruit. There are often three different types of fruit cracking in the growth period of the fruit, which is plagued by fruit farmers in cultivation management. Maogu citrus is a hybrid of broad-skin citrus and sweet orange, so the diseases of the two citruses, such as scab and ulcer, are susceptible to infection, and because of the often on the tip of the autumn shoot, it is easy to cause obstacles such as fruit wind and daily burning.

(3) CULTIVATION CHARACTERISTICS

For the extremely high-yield varieties, it is necessary to strengthen the fat culture and reduce the premature aging, especially in the application of nitrogen fertilizer and potassium fertilizer, which is 50% or even 1 time higher than the average citrus and orange. In order to avoid excessive results, we should pay attention to winter pruning, cut off the mother branches that are too long or too much, and reduce the amount of flowering results. The fruit should be early, and most fruit farmers do not dare to fruit the fruit because of the mid-term fruit cracking and fruit drop. This is the concept of fruit. In the middle and late stages, the fruit cracking and fruit drop are attributed to the excessive results, which cause the tree to be deficient in nitrogen and potassium. Therefore, in addition to attention to flowering and small and medium fruit stage irrigation and fertilizer cultivation, early fruit thinning should be carried out.

The flowering period is long, and the damage of the flower trips is more serious than that of the common citrus, which affects the appearance of the fruit. Therefore, it is possible to reduce the scar on the surface of the peel by adding 1 or 2 sprays during the flowering period and pay attention to the prevention and control of the fine in the spring and summer.

(4) PRODUCTION STATUS

At present, the world citrus producing countries have gradually paid attention to some artificial hybrid citrus varieties, such as Temple, King, Minneola, etc., and Maogu orange is also a hybrid citrus. Now, in addition to cultivation in Florida and Texas, it is cultivated in Brazil and Australia. Brazil's Maogu has been exported to Europe, Australia is also exported to Singapore, Hong Kong, and even exports 2,000 to 3,000 metric tons per year to Taiwan. The cultivation in various regions of Taiwan is more sporadic and more high-rise, and the production technology and fruit quality are uneven. At present, there are more uniform quality in the east, Meishan, Gukeng and Shui, and the Meishan cooperative farm has more common supply and supply markets. The color and fruit firmness of the Maogu mandarin in the north are better than those in the south, and the cracking fruit is less. In the spring of 2012, it has been exported to the mainland. (Taiwan citrus industry information website,2018)

As mentioned above, Maogu often has a large number of fruits drop and cracked fruit in the high production of the year. There are often three different types of fruit cracking during the growth period of the fruit, which is plagued by fruit farmers in cultivation management. Since Mogu is a hybrid orange, so the diseases of the two citruses, such as scab and ulcer, are susceptible to infection. In the future, new cultivation techniques can be used to improve disease resistance and avoid large numbers of fruit drop and fruit cracking. If the grafting life can be extended (about 20 years), such varieties can have higher economic value in economic benefits.

Genomic knowledge

To have genomic information we can check the citrus database, that we already talk previously.

The statue of the genome is important, and ca give us a lot of information. We know that the genome ploidy is between *n (haploid) to 4n (tetraploid)*. The citrus family has 9 chromosomes and a small genome (around 372 Mb).

Smallest genome	***C. reticulata Blanco***	**360Mb (haploid)**
Largest genome	*C. medica L.*	398Mb (haploid)

Two main projects were important to study and sequence the genome of the citrus familly.

International Citrus Genome Consortium (ICGC) in 2003, to create a citrus genetic databank for breeding researches, functional genomic and bioinformatic studies. Their goals were to obtain a coverage of 8-10x of the genome. They used 3 haploids derived from *Clementine mandarin*. They used 1 tri-haploid and 2 "true" haploids. To obtain homozygotic strain. The sequencing of this haploid (true haploid with pathogen free status), was a collaboration between France, Italy, USA, Spain and Brazil.

Another project was important for the citrus genome: 454 technology (by pyrosequencing). In parallel to the ICGC (haploid) the 454-technology wanted to sequence the genome of the sextet orange (*C. sinensis* cv. Ridge Pineapple) which is a diploid.

All the preliminary data of those project can be found in https://phytozome.jgi.doe.gov/pz/portal.html and the website we already show you (https://www.citrusgenomedb.org/). The number of genes found in the diploid and haploid Citrus was similar. The next step is to analyses the omics.

More than ***half million of EST*** were found and 80% come from four main species:

- *C. sinensis*
- *C. clementina*
- *C. reticula*
- *P. trifoliata.* Which is the ancestor.

The ***polyploidization*** of citrus is not rare, when seedling population are analyzed. Female 2n is frequent as 1-20%, it can be explained by the absorption of the 1st or 2nd meiotic division in the megaspore.

Tetraploids appears in apomictic [1]citrus.(Gmitter et al., 2012)

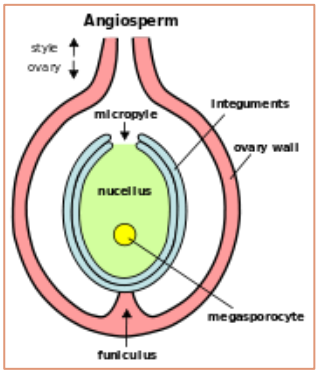


Figure 11: megaspore

[1] Asexual multiplication, with modification of meiosis. It's a specific type of parthenogenesis, in the female which give one diploid cell.

Breeding strategy

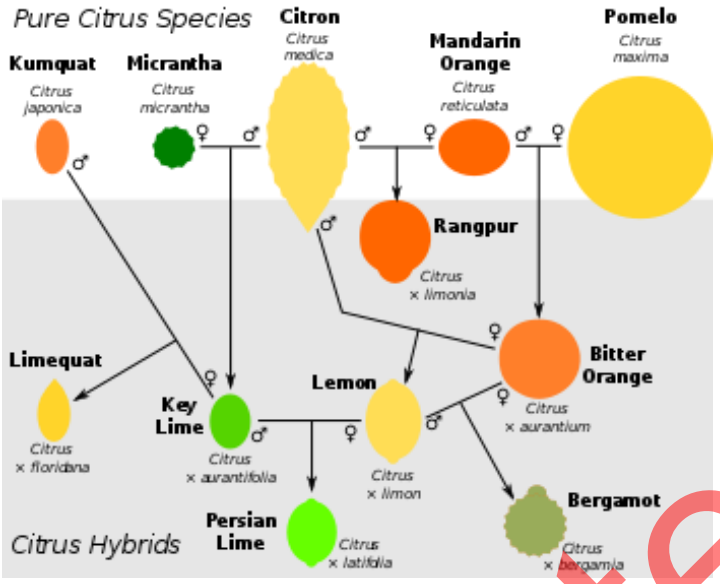


Figure 12: example of breeding

THE SCION BREEDING, ROOTSTOCK BREEDING AND GENOMIC-WIDE SECTION

Original citrus is starting from asexual propagation, somatic mutation also occurs with relative basic genotypes, the three-original species in the citrus genus that have been hybridized into most modern commercial citrus fruit are the mandarin orange, pomelo, and citron. The common citrus were created by crossing original species in last few thousand years, researcher trace back to the root of citrus it was from Himalaya region, include the eastern area of Assam, northern Myanmar and western Yunnan (Wu et al., 2018). Since citrus is one of major fruit in the worldwide, many strategies have been adopted to increase its productivity and quality. It is important to note that the citrus plant itself consists of two parts, the canopy(scion) and the rootstock, which are often from two different species and require targeted studies to improve their individual quality and interaction (Machado et al., 2011). The scion breeding programs are mainly aim at improving the fruit quality such as flavor, size, color, shape, and yield production, also decrease seed amounts, easy peeling, and disease resistance. The difference of rootstock breeding is aimed to control the size of tree, also improve resistance and tolerance to biotic and abiotic stresses. (Abouzari and Nezhad, 2016).

Professor Masao Iwashima, the world's master of citrus genetics and breeding, believes that the 21st century is a hybrid citrus century. Phenotypic selection is costly and time consuming, especially when the desired traits are expressed at later stages. In history, grafting and cuttings became popular to propagate best varieties was used in 1800s, till 1900s, artificial cross-pollination practiced were applied for breeding.

In 1900, Lande and Thompson proposed Marker-assisted selection (MAS) on phenotypic data only to increase selection efficiency. MAS utilizes phenotypic data and molecular markers in genetic linkage with certain loci controlling desired quantitative traits (quantitative trait loci, QTL). MAS has also been using to select traits about resistance to biotic and abiotic stress, unfortunately QTL identification can only explain a small fraction, this is not reach statistical significance when used in traditional QTL analysis. Therefore Genome-wide selection (GWS) was first proposed by Meuwissen in 2001, by using DNA markers on phenotypes, (which are in linkage disequilibrium (LD) with the QTL), can obtain both large and small effects and can account for nearly all of the genetic variation

within a quantitative trait. Due to these efficient selection of traits with low heritability, GWS perform the best function by selecting appropriate genetic crosses.

EXAMPLES IN TAIWAN

20 years ago, due to the weather condition, Arissa's father using scion breeding to mix with Citrus tankan Hayata and Citrus sinensis (L.), it combines the juice charastic from Citrus sinensis (L.) but increase the sweetness (from tankan Hayata), please see the figure (Figure 7: Ponkon from Arissa's farm in Taiwan & Figure 8:Honey Murcott).

Figure 13: left and right figures, aged 30 citrus tree mix with Citrus sinensis and tankan Hayata, photo credit: Arissa

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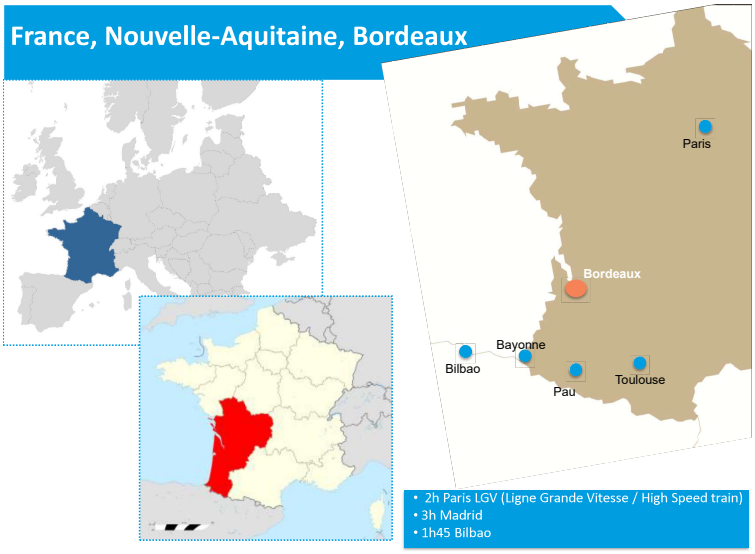
- https://agrapp.afa.gov.tw/citrus.asp?cID=39

Figures:

ANNEX V

université de BORDEAUX

France, Nouvelle-Aquitaine, Bordeaux



- 2h Paris LGV (Ligne Grande Vitesse / High Speed train)
- 3h Madrid
- 1h45 Bilbao

Riche patrimoine culturel et naturel ...
Rich cultural & natural heritage...

EUROPEAN BEST DESTINATION 2015 BORDEAUX

lonely planet

Bordeaux: Top city to visit in 2017

- **Culture:** Bordeaux, patrimoine mondial de l'UNESCO, "ville d'art et d'histoire", exemplaire par l'unité de son expression urbanistique et architecturale / Bordeaux, part of the UNESCO World Heritage List, "City of Art and History", "an outstanding urban and architectural ensemble".
- **Vin/Wine:** la capitale mondiale du vin avec environ 10.000 châteaux producteurs / the wine capital of the world with around 10,000 wine-producing châteaux.
- **Environment:** situé à seulement 1h de l'Océan atlantique, un climat doux océanique et une riche nature / located just one hour from the Atlantic Ocean, a mild oceanic climate and rich natural surroundings.

université de BORDEAUX

2014 Fusion des universités : Bordeaux **1**, Bordeaux **2** et Bordeaux **IV** Montesquieu / Universities Bordeaux **1**, Bordeaux **2** and Bordeaux **IV** Montesquieu merged

1995 Université Bordeaux 1 se divise en : Bordeaux **1** (sciences et technologies) et Bordeaux **IV** Montesquieu (économie, droit, sciences politiques) / Division of Bordeaux 1 university in : Bordeaux 1 (Science and Technology) and Bordeaux IV Montesquieu (Economics, Law, Political Science)

1968 Subdivision de l'UB : Bordeaux **1** (sciences, économie, droit), Bordeaux **2** (sciences sociales, sciences de la vie et de la santé), et Bordeaux **3** Michel de Montaigne (arts et sciences humaines) / Subdivision of the UB into : Bordeaux **1** (law, economy, science), Bordeaux **2** (life, social and health science) , Bordeaux **3** Michel de Montaigne (art, human sciences)

1441 Création de l'université de Bordeaux par le Pape Eugène IV / The University of Bordeaux is created by Pope Eugene IV

Université en chiffres

3ème université en France (selon n° d'étudiants)
3rd French university (based on n° of students)

- Plus de **56.000** étudiants / Over **56,000** students
- Budget annuel / Annual budget: **572M€**

Offre de formation / Academic offer

- **125**: Licence (LicPro inclus)/Bachelor (incl. vocational)
- **245** : Master
- **115** : diplômes nationaux en santé / national diplomas in Health
- Diplôme national en **science du vin** / National diploma in **wine** science

Research

- **8** écoles doctorales / doctoral schools
- **70** laboratoires / research units
- **2.000** étudiants en doctorat / PhD students

Campus

- **187** hectares: un des plus grands campus européens / one of the largest Campus sites in Europe
- **538M€**: Opération Campus, projet de rénovation en cours / Operation Campus, an ongoing renovation project

Formation et Recherche : organisation / Education & Research: organization

FORMATION / EDUCATION Collèges / Faculties	
Droit, Science politique, Economie et Gestion Law, Political Sciences, Economy & Management	Sciences humaines Human Sciences
Sciences de la Santé Health Sciences	Sciences et Technologies Science & Technology

DEPARTEMENTS DE RECHERCHE RESEARCH DEPARTMENTS
Sciences & Technologies Science & Technology
Sciences du vivant et de la santé Life & Health Sciences
Sciences humaines et sociales Human & Social Sciences

International

Formation / Education

- **6. 200** étudiants internationaux / international students
- **60** formations internationales (13 labelisées par l'UE) international study programs (13 EU-labeled programs)
- **700** universités partenaires dans **80** pays / **700** partner universities in **80** countries
- **13** programmes Erasmus Mundus
- **2.000** étudiants en échange / exchange students

Recherche / Research

- **> 800** chercheurs internationaux/an international researchers/year
- **20** laboratoires internationaux International research laboratories

Student life

université de BORDEAUX

Compte bancaire / Bank account

Vous aurez besoin d'un compte bancaire en FR pour le CROUS, la CAF ou pour avoir un numéro de téléphone français. / You will need a French bank account for the CROUS housing, CAF subsidy or French phone.

Comment ouvrir un compte bancaire? / How you can open a bank account ?

- Prendre rendez-vous à la DRI ou à la banque / Take an appointment in the Inernational office or in the bank
- Présentez les documents lors de votre rendez-vous / Provide the documents during the appointment

Quels documents ? / Which documents ?

- Passeport / passport
- Attestation de domicile en France / Proof of your housing in France

Carte de séjour / Residence permit card

https://www.u-bordeaux.fr/International/Venir-a-Bordeaux/Etudiants-internationaux/Informations-pratiques/Carte-de-sejour-Etudiant

> International > venir à Bordeaux > étudiants étrangers > informations pratiques > carte de séjour « étudiant »

- suivre la procédure sur **le site de l'université** / follow the procedure **on the university website**
- prendre rendez-vous / take an appointment
- Imprimer l'accusé de prise de rendez-vous / Print out the details of your appointment

Inscription à l'université / Registration at the university

1. Administrative registration

La DRI vous fournira votre **carte étudiante** et votre **certificat de scolarité** / The International Office will provide you with the **student card** and the **certificate of the Registration**

2. Activer son ENT (Espace numérique de travail) / Activate the ENT account

https://activation.u-bordeaux.fr/

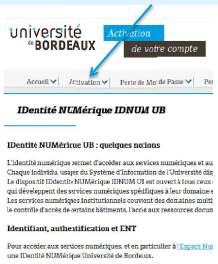
3. Pedagogical registration

- Registration in every course
- Contact : Florence LARTIGAUT

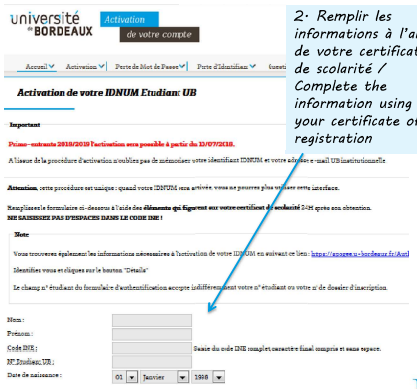
Activer l'ENT / Activate the ENT

Une fois vous avez le certificat de scolarité il est important d'activer votre **ENT.**
Once you will have your certificate of registration it is important to active the **ENT account**.

1. *Se connecter sur https://activation.u-bordeaux.fr et choisir « Activation : Etudiant UB » / Open the page https://activation.u-bordeaux.fr and choose « Activation : Etudiant UB »*



2. *Remplir les informations à l'aide de votre certificat de scolarité / Complete the information using your certificate of registration*



Connexion wifi sur le campus / wi-fi connection in the campus

Avec votre carte étudiante et le certificat de scolarité
With your student card and the certificate of registration

- Activer votre compte ENT (Espace Numérique de Travail) sur le site de l'université . / Activate the ENT account on the website of the university.
  https://activation.u-bordeaux.fr
- Sur le campus de l'université choisir « EDUROAM » et se connecter avec l'identifiant et le mot de passe / in the university campus select « EDUROAM » and connect you with your login and password
- Recharger votre carte « Izly » et l'utiliser pour d'autres services (restaurant universitaire, bibliothèque, …). /Put some money on your « Izly card and use it for for other services (university restaurant, library, …).

ENT (Espace Numérique de Travail) : vous y trouverez votre inscription, votre boîte mail, les cours en ligne … / You will find there the details about your registration at the university, your e-mail box, the on-line course …

Calendrier universitaire / Academic calendar

Ces dates sont approximatives et peuvent varier selon chaque formation. / These dates are approximative and may vary according to your academic program.

Semestre d'automne / Fall semestre	Septembre - Décembre
Période d'examen / Exam period	Décembre / Janvier
Semestre de printemps / Spring semester	Janvier – Mai
Période d'examens / Exam period	Mai / Juin / Juillet

Bienvenue / Welcome
21 septembre
Accueil officiel des étudiants internationaux/ official welcome for all foreign students

Vacances / Vacation period

- Vacances de la Toussaint / Autumn Holidays : du 24 octobre au 2 novembre 2018
- Vacances de Noël / Christmas Holidays : du 24 décembre 2018 au 4 janvier 2019
- Vacances d'hiver / Winter Holidays : du 25 février au 1er mars 2019
- Vacances de printemps / Spring Holidays : du 22 au 26 avril 2019

Cours de FLE / French language course

Si vous souhaitez suivre les cours de français, vous devez :
If you wish to follow the French course you need to :

- compléter la fiche d'inscription / complete the enrolment sheet
- envoyer à / send to incoming-talence@u-bordeaux.fr
- **rajouter** ce cours sur votre **contrat pédagogique** / **add** this course on your **learning agreement**

Autres activités / Other activities : sport, culture, association, …
www.u-bordeaux.fr > campus

Numéros à noter / Numbers to be noted

Numéro d'appel d'urgence / Emergency number	**112**
Police	**17**
SAMU / Emergency Ambulance Service	**15**
Pompiers / Fire service	**18**
Poste Central de Sécurité Incendie (PCSI) / Security in the campus	**05 40 00 89 79**
Espace Santé Etudiant / Student Health Care Center	**05 56 04 06 06**
Infirmière / Nurse	**05 40 00 36 81**

VIGIPIRATE

Numéro d'astreinte DRI / Emergency number International Office
+33 (0)6 79 89 16 32

Pour trouver les informations… / To find information…

- Site web / website
- E-mails envoyés par la DRI / E-mails sent from the International office
- Guide pour les étudiants internationaux / Guide for international students
- ENT
- Affichage à la DRI ou au BVE / Posted information in the International office or in Student Life office

Quelques conseils à noter / Some advices to be noted

1. Dire "bonjour" lorsque vous commencez une communication. / Say "bonjour" when you start your communication.
2. Un e-mail est un courriel électronique, il convient de préciser l'objet de votre courriel, se présenter, exprimer clairement votre/vos demandes, utiliser des formules de politesse et signer à la fin. / The e-mail is an electronical mail, you should specify the object of your mail, introduce briefly yourself, specify your request(s), use the forms of politeness and sign at the end.
3. Etre attentif/ive aux conseils du personnel ou des enseignants. / Be aware of the advices provided by staff.
4. Etre poli(e), avoir du respect pour les autres et être diplomate./ Be polite, respectful and diplomatic.

Contacts

Direction des Relations Internationales
Lundi – jeudi : après-midi (14h – 17h)
Vendredi : matin (9h-12h)

E-mail

≠ chat (!)

= courrier électronique* / electronic mail*

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Bureau de vie étudiante (BVE, Guiche unique) / Student Life Center
guichet.unique@u-bordeaux.fr ; bve-talence@u-bordeaux.fr
Tél : 05 40 00 84 84

Bon séjour à l'Université de Bordeaux !

Enjoy your stay at
the University of Bordeaux !

université de BORDEAUX

ANNEX V

fête ! la rentrée 2018

Bienvenue !

université de BORDEAUX

The daily life in Bordeaux

Bordeaux, the N°1 city to visit*

- Its Port de la lune, Unesco world heritage site
- 88 000 students, more than 10% of the Metropole population
- 11 museums, 1 Opera, 17 cinemas, 37 concert rooms, 101 park and gardens, 2 stadiums, 1 ice-skating,

** Best city to visit according to the Lonely Planet in 2017 and European Best destination in 2015*

Carte jeunes
(for less than 26 years old)
Many reductions on museums, concerts, etc.
Get it online or to the City hall

Finances

Budget

- Accomodation : between 150-500 €
- Food (RU) : 200€
- Transport: 20€
- Leisure activities : 50 € (drink : 4-5 €, cinema : 8-9 €, restaurant : 15-20€,)
- Phone/Internet : 30 €
- Insurances : 50€

= 750 €/month*

*Extra-costs the 1st month as registration fees, security deposit, etc.

Opening a bank account
Necessary to get the CAF, etc.
In any bank with your passport and proof of residence.

Students jobs

Many opportunity jobs (childcare, tutoring , seasonal agricultural work), **including withing the University** *
*Ask the Students life office

Work and visa?
In most cases, it is possible to work up to 60% of a full-time job, or no more than 964 hours in a year.

Job dating
20th of September
2-5 PM
Victoire University site
Bring your CV!

Social aid

You may benefit from different aids.
Ask social workers at the University:

- Laetitia LEPRAT (compulsory online appointment)
  www.crous-bordeaux.fr
- Joëlle ROBILLARD
  Tel. 05 33 51 42 09

Comptoir d'Aliénor
A grocery for low income students on the campus (near building A5)

Accomodation

www.housing.u-bordeaux.fr
A platform dedicated to our students
Password: HOUSINGUBX

Accomodation

Many different options:
- CROUS University residence 149 - 330 € (*application between 15th of January and 30th April – foreign students in Bachelor excluded)*
- Private residences: 450-550€
- Private flat: From 500€
- Apartment sharing…

In any case, the accomodation insurance, a compulsory procedure (20-60€ a year)

Financial aid

You may qualify for a student accommodation aid from the CAF* (Caisse d'allocations familiales).
Online application: www.caf.fr

**CAF and Action logement will be on the campus on 30 and 31st of August*

No french « garant »?

VISALE from Action logement* offers you to be your rental payment guarantee for free (for young people up to 30)
www.visale.fr

Etu'récup
offers affordable furniture, electronic appliances and dishes to help with your installation.

Food

Order it every Thursday 12pm in the A22

- University restaurants
  - La Soucoupe cafeteria (A22) -
    Monday to Friday : 7.45am - 6pm (except Friday : 5pm)
  - RU1 (tram stop Arts et Métiers) -
    Monday to Friday : 11.30am - 1.30pm and 6.30pm – 7.45pm / Saturday : 11.30 am to 1.30 pm

3,25€

- Foodtrucks on the campus
- More proposals around the campus (sandwiches 4€, student formulas 6€, etc.)

You can pay with your carte Aquipass, and many other things

Transport

TBM, the local company

Bus, tramway, boat and bike V3
•Pass Jeune for 1 year : 19,20 €/ month
•Tickarte 10 trips for students : 7,40 €
•Tickarte 1trip : 1,60 €

Tramway lines run from 5.00 AM to 1.00 AM (on Thursdays, Fridays and Saturdays). Tramways run every 3-5 minutes on average, during the day)

From the campus of Talence : Tramway line B - 14 min from Béthanie to la Victoire
Bus lines 8, 10, 20, 34, 87, 21, 35

Bordeaux by bike ?

Free rent for up to 1 year in any Maison Métropolitaine des Mobilités Alternatives

On the campus: Eturécup, RU2 le Bateau, Tram B – Doyen Brus stop
hello@eturecup.org

You can also buy cheap second hand bikes

Go farer

By bus :
www.transgironde.gironde.fr
2,60€ one way full tarif (4.20€ return ticket) 2,60€ return ticket during summers for young people (up to 20 years)

By bus/train: SNCF
www.sncf.com
Carte jeunes: 50€/year – many reductions on trips

Carsharing
www.blablacar.fr

Phone

- With or without a phone plan :
  - With a plan (bank account needed) : from 2€ (Free)
  - Without contracts: prepaid cards (1st, get a SIM card about 10€, and then a recharge card from 5€ in any bureau de tabac, etc.)

- 3 main operators : SFR, Orange, Bouygues but there are much more (Free, La poste, etc.)

Health coverage

Emergency number :
On the campus : 05 40 00 89 79
Firemen : 18 or 112
Emergencies : 15
Police : 17

- Social security :
  - EU citizen: Your health related expenses may be cover by your country health insurance (you may have a European Health Insurance Card)
  - Non EU citizen : You must register to the French health insurance (CPAM) to benefit from health coverage. Online registration : www.etudiant-etranger.ameli.fr
- Complementary health insurance (for expenses not covered by social security) : not compulsory – Registration with any insurance company

The campus life

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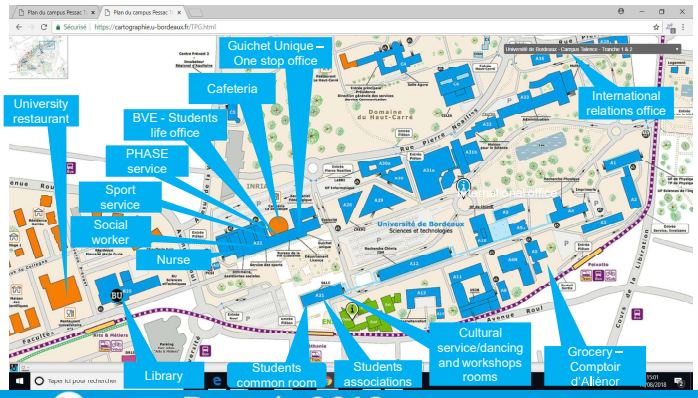

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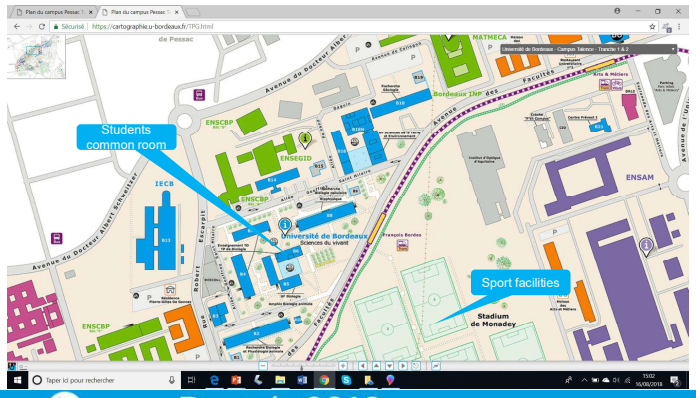

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Guichet Unique/Students life office

Our mission :
Welcoming you
Informing you
Supporting you

Contact :

- Every day from 8.30 AM to 5.30 PM (except on Friday until 4 PM)
- Bve.talence@u-bordeaux.fr

Rentrée 2018

Students associations

- About 20 students associations on the campus
  - Mathematics
  - Computing
  - Chemistry
  - Biology
  - Earth and life sciences
  - Ingeneering
  - Generalist ones
- More than 130 in the University

There is one for you for sure !

*Ask the Students life office for more information

- Some of the 2017 projects :
  - End of year concert
  - Game library
  - Ski week ends
  - Conferences
  - Discovery field trips
  - A community garden

Want to lead projects on the campus ?

Ask for the FSDIE to the Students life office

Rentrée 2018

Sports

You can also participate to 15 sportive nights and many stays during the year

More than 50 activities with different ways of practice (as free player, with a recognition in the study program, in competition)

- Athletics,
- Team sports: basketball, football, rugby, handball, volley, futsal...
- Racket sports: tennis, table tennis, squash, Basque pelota, badminton ...
- Gymnastics: floor and bar exercises, stretching ...
- Water sports: swimming, water polo, scuba-diving, kite surf, kayak, surf...
- Dance: contemporary dance, modern Jazz, rock and roll, salsa...
- Combat sports: judo, jiu jitsu, lutte, taekwondo, French boxing...
- Weight/fitness training
- Outside activities: skiing, snowboarding

Sport office on the campus:
Open from Wednesday afternoon, Thursday and Friday all day
Building A 22 main floor
Tel. 05 40 00 63 69
Sport-st@u-Bordeaux.fr

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Culture

- Free cultural workshops
  - Dancing
  - Theater
  - University orchestra
  - Drawing and painting
  - Photography

Dancing and workshop rooms and a rehearsal music chamber

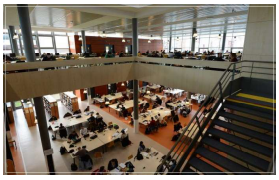
- Les moissons d'avril – the students cultural festival
- And a rich cultural programmation all along the year

Contact

A21 main floor
culture@u-bordeaux.fr

Rentrée 2018

Scientific and technical library



- Science books and novels in English.
- Spaces to work alone or in groups, to meet others students or just to relax.

English spoken

Opening hours

Monday to Friday : 8:30am to 10 pm
Saturday : 9am to 6pm

A question ? doc-bibliotheque@u-bordeaux.fr
Website : http://bibliotheques.u-bordeaux.fr/

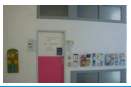
Health

Student health center
22 avenue Pey-Berland, Pessac
Tram B - Arrêt Doyen Brus
Tel. 05 33 51 42 00
From Monday-Friday 9 AM-7 PM (5 PM on Friday)

Many professionals (general practicioner or specialist such as psychologist, sport medicine, etc.)
And support health students for all issues about nutrition, parties, sex, mental health

Students do not have to pay

- And also a nurse on site (A22 main floor, in front of Amphi Franklin)
- For daily pains
- And sophrology lessons
- Catherine.taormina@u-bordeaux.fr



Integration activities

Buddy system

https://parrainage.u-bordeaux.fr/

A Bordeaux University platform dedicated to connect international students and local students and help them in all first steps, practical life, integration…

How it works?

1- Connect to the platform and create an account (you may receive your password by e-mail)
2- Search among many profiles of local students according to different criterias (field of study, specific interests, languages spoken, etc.)
3- Send messages and exchange with students
4- Send invitations to get mentored
5- If your invitation has been accepted, you may meet your mentor

Blablapéros

How to become French in 3 lessons and with wine…

- **1st : Practical and daily life in France**

Attitudes, habits, customs, to-do/not-to-do, true « clichés », etc
Wednesday 26th of September 6PM

- **2nd : How to speak French in your everyday life ?**

French expressions and what they mean, regional expressions and words, slang, etc
Wednesday 10th of October 6PM

- **3rd : French culture: from clichés to ciné**

History, Literature, clichés or not clichés ?, Cinema, Music, etc
Wednesday 24th of October 6PM

Erasmus and Mundus club

⇒ **What is it?** A Senior club, very active for international students integration

⇒ **Activities on the campus**: « Bricoles et petits riens » (DIY workshops) - first Thursday of every month at 12 PM

⇒ **Activities outside the campus** : biking, cooking lessons, cine every 2 weeks on Tuesday at 2:45pm

*All the program is sent by e-mail and inscriptions are done by e-mail

Associations

M-TECH

MTECH
✓ Buddy system
✓ Yearly trip

mtech.bdx1@gmail.com

AAPI

AAPI
✓ International cine
✓ Pechakuchas
✓ International meals

aapi.asso.contact@gmail.com

Agenda

- 10-14th of September, 1PM, EOC (A22): ENT, what is it ?
- 17-22nd of September : Fête la rentrée (in front of the A22)
  - **Monday 17th :**
    - **12 – 2PM :** Outside games and animations : have your portrait taken, free hugs, world food, tatoos, exhibition about discrimination
    - **6.30 PM :** Board games evening
  - **Tuesday 18th :**
    - **12 – 2PM :** Associations village dedicated to sciences – Come and experiment funny things and have your scientific drink
    - **6 PM :** Escape games
  - **Wednesday 19th :**
    - **12 – 2PM :** Open mic, free zone, food and drinks
    - **18h :** Cultural workshops presentation and meeting with professors and concert

*During those 3 days, try to valide your associative passport and you may win cinema tickets !

Agenda

- 17-22st of September : Fête la rentrée
  - **Thursday 20th :**
    - **2 – 5 PM :** Job dating – Bring your CV ! (Victoire site)
    - **6 PM :** Station campus « Between past and present »
      - Surprising walk in the campus, vertical concert and performances (A4), drink
  - **Friday 21st** : World students night
- 27-6th of October : Campulsations, the cultural festival to celebrate the start of the academic year
- 12-16th of November : International week

Agenda

- Visits/Activities :
  - **Saturday 15th and 22nd of September :** Harvest in the vineyard - 5€ (inscription at the Guichet Unique from the 3rd of September)
  - **Saturday 6th of October :** Bordeaux welcome students – free visit of the city (online registration on the city of Bordeaux website until the end of September)
  - **October :** Visit of Pessac (le Corbusier area and vineyard)
  - **November :** Wine tasting
  - **December :** Ice skating Christmas party

*The program of activities will be sent to you by e-mail every 2 weeks. If you do not receive it, please contact us: bve.talence@u-bordeaux.fr

Rentrée 2018

Contacts

UB GIP Office

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