

Integrative unit with omics & bioinformatic tools
オミクスとバイオインフォマティクスの食料健康科学への応用
(ボルドー大学)

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| Course | Integrative unit with omics & bioinformatic tools |
| Course No. | 01ER602 |
| Credits | 3 credits |
| Grade | 2 nd year |
| Timetable | Fall AB |
| Instructor | Prof. Dominique Rolin (UB)、 Prof. Antoine de Daruvar (UB)、 Prof. Michel Hernould (UB)、 Prof. Philippe Gallusci (UB)、 Prof. Catherine Bennetau (UB)、 Associate Prof. Kentaro Mori (UB)、 Associate Prof. Valérie Schurdi-Levraud (UB)、 Associate Prof. Patricia Thebault (UB)、 Associate Prof. Pierre Pétriacq (UB)、 Associate Prof. Stéphanie Krisa (UB) |
| Course Overview | <p>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.</p> |
| Remarks | Conducted in English at University of Bordeaux. |
| Course Type | Experiments and practical training |
| Link between Course Objectives and Activities | Analyzing omics data as an important knowledge basis regarding the functionality of bioresources and their potential medical applications, make the connection between health and food resources as well as build up on the expertise on the evaluation of food resource exploitation. |
| Academic Goal | <p>During this course student will learn about:</p> <ul style="list-style-type: none"> ◦ the basic concepts, technical terms and technology involved of omics 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) <p>Students will receive</p> <ul style="list-style-type: none"> - 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 anthocyanins, carotenoids and their potential benefits for human nutrition |

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| Course Schedule | <ol style="list-style-type: none"> 1. Lectures by specialists of omics tools and bioinformatic 2. Analysis of omics data 3. Case studies of selected molecules from their biosynthesis in plants or microorganisms to their human nutritional effects |
| Course Prerequisites and Advisories | |
| Grading Philosophy (Percentage/ Criteria/ Methodology) | Each student has to take part in the presentation of one molecule which have human benefits. Both the clarity and the accuracy of the presentations will be quoted. Each student will also have to answer to precise questions from the audience. The accuracy of their answer will be evaluated. The students will have to report on the practical training. The report will be quoted. |
| Self-Directed Learning Other Than Coursework | At home, students will have to prepare a survey on one molecule which have positive or negative human health benefits (vitamins, microtoxins, secondary metabolites as carotenoids or polyphenols). They will have to present as a conference to other students. |
| Textbooks, References and Supplementary Materials | None |
| Office Hours | By appointment only. |
| Other (i.e. Expectations on Classroom, Conduct and Decorum etc.) | None. |
| Related Courses | |
| Keywords | |