BIO-441 Nutrition: from molecules to health
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<th>Cursus</th>
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<td>Ingénierie des sciences du vivant</td>
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Language: English  
Credits: 4  
Session: Summer  
Semester: Spring  
Exam: During the semester  
Workload: 120h  
Weeks: 14  
Hours: 4 weekly  
Lecture: 2 weekly  
Exercises: 2 weekly  
Number of positions

Remarque
Integrated and holistic systems approach from molecules to health - For MSc students only

Summary
The course will address how nutrition affects human health and disease. We will describe how nutrients are absorbed and metabolized. We will introduce the concept of the integrated systems approach to better define human health based on holistic phenotyping of human individuals.

Content
- Fundamentals of nutrition and its impact on human health and non-communicable disease
- Introduction of the gastrointestinal system and the hormonal regulation of digestion and absorption.
- Effect of glucose and fructose on tissue function and human health
- Polyphenols and their impact on health and disease
- Introduction and current utility/challenges of omics technologies for nutritional and health sciences, with emphasis on the characteristics of the technologies (genomics, proteomics, metabolomics, micronutrient analysis)
- Translations and applications of molecular phenotyping in the areas of metabolic and gastrointestinal health.
- Concept and utility of molecular phenotyping to clinical intervention studies
- Methods and concepts of human genetics and their applications to nutrigenetics

Learning Outcomes
By the end of the course, the student must be able to:
- Define the basics of nutrition and its impact on human health
- Manage principles of macronutrient absorption and metabolism
- Demonstrate knowledge about current omics technologies
- Develop a molecular understanding of the role of nutrition in health

Teaching methods
Lectures

Expected student activities
Reading, analysis, presentation of a scientific article in the field of nutrition and preparation of a mini grant proposal.

Assessment methods
Weekly evaluation with a quiz (questions related to the course), presentation of one scientific article (from a proposed list), writing of mini grant