Nutrition: from molecules to health

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Cursus

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<th>Ingénierie des sciences du vivant</th>
<th>Sem.</th>
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<td>Sciences du vivant</td>
<td>MA2, MA4</td>
<td>Opt.</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: 2

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

Summary
We will introduce the fundamentals of nutrition and its impact on human health and disease. Then we will introduce a concept and strategy termed "Integrated systems approach," i.e., a multidisciplinary methodology to better define human health based on holistic phenotyping of human individuals.

Content

- Fundamentals of nutrition and its impact on human health and disease
- Discussion of traditional and novel experimental designs for evaluating the role of nutrition in human health
- Introduction and current utility/challenges of omics technologies for nutritional and health sciences, with emphasis on the characteristics of the technologies (genomics, proteomics, metabolomics, lipidomics, micronutrient analysis)
- Translations and applications of molecular phenotyping in the areas of human ageing and metabolic/gastrointestinal health.
- Molecular signaling pathways and regulation of nutrient uptake and utilization
- Concept and utility of molecular phenotyping and integrated systems analysis.

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
- Demonstrate knowledge about current omics technologies and their utility and limitations for human nutrition and health research
- Develop a molecular and systems understanding of the role of nutrition in health
- Define key molecular and cellular pathways that control glucose and energy homeostasis

Transversal skills

- Access and evaluate appropriate sources of information.
- Summarize an article or a technical report.
- Demonstrate the capacity for critical thinking

Teaching methods
Lectures and exercises

Expected student activities
Reading, analysis and presentation of articles.

Assessment methods
Written exam during the semester