BIO-441

Nutrition: from molecules to health

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Cursus	Sem.	Type
Sciences du vivant	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Courses	2 weekly
Exercises	2 weekly
Number of positions	

Remark

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 â##Integrated systems approachâ##, 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/challengtes of omics technologies for nutritional and health sciences, with emphasis on the characteristics of the technologies (genomics, proteomics, metabolomics, lipidomics, micronutriment 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