Course syllabus

Tarmflorans betydelse för hälsa
Insights into Health and Gut Microbiome

TFRP15, 7,5 credits, A (Second Cycle)

Valid for: Single courses at LTH autumn 2022
Faculty: Faculty of Engineering, LTH
Decided by: PLED B/K
Date of Decision: 2021-12-08

General Information

Language of instruction: The course will be given in English

Aim

To encourage and stimulate the interest of students for nutritional science with an emphasis on the physiology of nutrition, elucidating functional adaptation to macromolecules digestion and also facilitate understanding of the role of gut microbiota in human health and how different diets affect the gut microbial composition.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- have deeper knowledge in nutritional physiology
- learn which factors affect colonization and establishment of the gut flora
- understand about intestinal barrier function, mucosal immunity and inflammation
- understand principles of Next Generation Sequencing technology for studying intestinal microbiome

- understand how our diet components, pre- and probiotics can affect gut flora composition and function
- understand how intestinal flora may influence function of peripheral organs

Competences and skills
For a passing grade the student must

- be able to describe and estimate the importance of intestinal flora throughout life
- be able to report in writing form om current research conducted in a selected area of nutrition and health

Judgement and approach
For a passing grade the student must

- demonstrate the ability to critically analyse and evaluate information regarding diet-related changes in intestinal flora composition and possible effects on health
- write an individual assignment based on scientific papers

Contents

This course is suitable for professionals or students with some background in nutrition who wants to deepen their knowledge in the field focused on the digestion and utilization of dietary macronutrients by the human digestive system with insights in colonization of microorganisms, establishment of their composition and role in human health and immunity.

The following topics are included in the course:

- Repetition of the fundamentals of nutrition and digestive system physiology.
- Dietary and environmental factors affecting colonization and establishment of gut microbiota (i.e. geographic location, society, mode of delivery, breastfeeding, bioactive food compounds, indigestible carbohydrates etc.)
- Gut barrier function, immunity and inflammation (i.e. factors affecting mucus production, antimicrobial secretion, cross-talk between commensal bacteria and immune cells etc.)
- Next Generation Sequencing as a modern technique to study gut microbiome (i.e. samples collection, storage, extraction and sequencing of microbial genome, reference databases etc.)
- Exploring concepts for targeted nutrition and microbiome-focused treatments for metabolic disease prevention (i.e. investigating diet-related microbiome changes in relation to health benefits etc.)
- Special attention will be paid to potential constraints for normal physiological functioning of the body during development and aging, thus no inherited genetic pathology or infection diseases will be included in the course.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Individual written literature report assessing ability to search literature, evaluate the content and critically discuss the subject and individually written home examination.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Parts
Code: 0120. **Name:** Insights into Health and Gut Microbiome.
Credits: 4,5. **Grading scale:** TH. **Assessment:** Individually written home examination
Code: 0220. **Name:** Literature Overview Project.
Credits: 3. **Grading scale:** UG. **Assessment:** Includes individual written literature report assessing ability to search literature, evaluate the content and critically discuss the subject

Admission

Admission requirements:

- 90 credits whereof at least 7.5 credits in either human physiology, nutrition, mucosal immunology or similar. English 6

Reading list

- Erdman J. W., Macdonald, I. A. Zeisel, S. H.: Present Knowledge in Nutrition, 10th Edition. Wiley, 2012, ISBN: 978-0-470-95917-6.
- Additional scientific articles and electronic resources.

Contact and other information

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