<table>
<thead>
<tr>
<th>Module title</th>
<th>Foodomics</th>
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<tbody>
<tr>
<td>Code</td>
<td>F3</td>
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<tr>
<td>Degree Programme</td>
<td>Master of Science in Life Sciences</td>
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<tr>
<td>Group</td>
<td>Food</td>
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<tr>
<td>Workload</td>
<td>3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)</td>
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</tbody>
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| Module Coordinator | Name: Dr. Wolfram Brück (HES-SO, Sion) – Representing FNH (BFH)  
Phone: +41 (0)27 606 86 64  
Email: wolfram.bruck@hevs.ch  
Address: HES-SO Valais//Wallis, Institute of Life Technologies, Route du Rawyl 64 1950 Sion |
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<tr>
<td>Lecturers</td>
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</table>
- Dr. Wolfram Brück  
- Guest lecturers |

| Entry requirements | Preparatory reading list given before course begins and unmarked online pre-test on reading material  
Preparatory work for terminology and online pre-test |

| Learning outcomes and competences | After completing the module, students will be able to:  
- Explain digestive tract anatomy & function;  
- Explain a nutrient's absorption, metabolism, elimination or biological effects;  
- Evaluate current nutrigenomic, microbiome and metabolome methods (16S sequencing and metagenome sequencing (NGS-based), NMR, HPLC-MS, GC-MS);  
- Develop strategies to evaluate and analyse large data sets (data mining);  
- Formulate their own ideas on the impact of dietary regulation of gene function on human disease;  
- Explain the basics of systems biology. |

| Module contents |  
- Digestive tract anatomy & function  
- Nutrient absorption, metabolism, biological effect and elimination  
- Nutrition and the human microbiome in health and disease  
  - I: Overview  
  - II: Gut-Brain Axis and autoimmune diseases  
- How the Microbiome Influences Host Diet Metabolism  
- How Diet Impacts the Microbiome  
- Pre- and Probiotics  
- Microbiota-Targeted Therapies: An Ecological Perspective  
- Tools and Models for Assessment of the Microbiome and Metabolome  
- Dietary regulation of gene function  
- Metabolic disorders  
- Working with large data sets: Strategies, Programs, Formatting  
- Functional Foods and personalised nutrition  
- Regulatory Framework & Challenges  
- Systems biology |

| Teaching / learning methods | Self-study, group work, student and instructor presentations, instructor lead discussions, case studies |
### Assessment of learning outcome
1. Presentation of group work (40%)
2. Written final examination, closed book (60%)

### Format
7-weeks

### Timing of the module
Spring semester, CW 8-14

### Venue
Bern

### Bibliography

**Pre-course reading:**

**Selected reading (suggested):**
- **Foodomics: Advanced Mass Spectrometry in Modern Food Science and Nutrition.**
  Editor: Alejandro Cifuentes, Print ISBN: 9781118169452
- **NMR-based Metabolomics**
- **Bioinformatics for High Throughput Sequencing**
- **Diet-Microbe Interactions in the Gut, 1st Edition, Effects on Human Health and Disease**
  Editors: Kieran Tuohy, Daniele Del Rio, Print ISBN: 9780124078253
- **The Gut Microbiome in Health and Disease**
  Editors: Dirk Haller, Print ISBN: 978-3-319-90544-0
- **The Gut-Brain Axis: Dietary, Probiotic, and Prebiotic Interventions on the Microbiota**
  Editors: Niall Hyland, Catherine Stanton, Print ISBN: 978-0-12-802304-4
- **Metabonomics and Gut Microbiota in Nutrition and Disease**

### Language
English

### Links to other modules
The present module complements specialisation modules of BFH FNH-4 “Food for Specific Target Groups“ and FNH-5 “Food Ingredients“, where more specific subjects are addressed

### Comments

### Last Update
05.08.2019