Module title	**Foodomics**
Code	F3
Degree Programme	Master of Science in Life Sciences
Group	Food
Workload	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
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, Rue de l'Industrie 19 1950 Sion
Lecturers	• 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 (50%) 2. Written final examination, closed book (50%)
Format	7-weeks
Timing of the module	Spring semester, CW 8-14
Venue	Blended learning format. Presence sequences take place in Berne
Bibliography	Pre-course reading: • Pray L, Pillsbury L, Tomayko E, 2013. The Human Microbiome, Diet, and Health. The National Academic Press, Washington D.C., USA (doi.org/10.17226/13522.) – **Free pdf download** Selected reading (suggested): • Foodomics: Omic Strategies and Applications in Food Science Editor: Jorge Barros-Velázquez, Print ISBN-10: 1788018842 • Foodomics: Advanced Mass Spectrometry in Modern Food Science and Nutrition, Editor: Alejandro Cifuentes, Print ISBN: 9781118169452 • Bioinformatics for High Throughput Sequencing Editors: Naiara Rodríguez-Ezpeleta, Michael Hackenberg, Ana M. Aransay, Print ISBN: 978-1-4614-0781-2 • The Gut Microbiome in Health and Disease Editors: Dirk Haller, Print ISBN: 978-3-319-90544-0 • Metabonomics and Gut Microbiota in Nutrition and Disease Editors: Sunil Kochhar, Francois-Pierre Martin, Print ISBN : 978-1-4471-6538-5
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	20.08.2025