

# Master in Life Sciences

A cooperation between  
BFH, FHNW, HES-SO, ZHAW

<b>Module title</b>	<b>Foodomics</b>
<b>Code</b>	F3
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	Food
<b>Workload</b>	3 ECTS (90 student working hours: 42 lessons contact = 32 h; 58 h self-study)
<b>Module Coordinator</b>	<p><b>Name:</b> Dr. Wolfram Brück (HES-SO, Sion) – Representing FNH (BFH)</p> <p><b>Phone:</b> +41 (0)27 606 86 64</p> <p><b>Email:</b> <a href="mailto:wolfram.bruck@hevs.ch">wolfram.bruck@hevs.ch</a></p> <p><b>Address:</b> HES-SO Valais//Wallis, Institute of Life Technologies, Rue de l'Industrie 19 1950 Sion</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Dr. Wolfram Brück</li> <li>• Guest lecturers</li> </ul>
<b>Entry requirements</b>	<p>Preparatory reading list given before course begins and unmarked online pre-test on reading material</p> <p>Preparatory work for terminology and online pre-test</p>
<b>Learning outcomes and competences</b>	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> <li>• Explain digestive tract anatomy &amp; function;</li> <li>• Explain a nutrient's absorption, metabolism, elimination or biological effects;</li> <li>• Evaluate current nutrigenomic, microbiome and metabolome methods (16S sequencing and metagenome sequencing (NGS-based), NMR, HPLC-MS, GC-MS);</li> <li>• Develop strategies to evaluate and analyse large data sets (data mining);</li> <li>• Formulate their own ideas on the impact of dietary regulation of gene function on human disease;</li> <li>• Explain the basics of systems biology.</li> </ul>
<b>Module contents</b>	<ul style="list-style-type: none"> <li>• Digestive tract anatomy &amp; function</li> <li>• Nutrient absorption, metabolism, biological effect and elimination</li> <li>• Nutrition and the human microbiome in health and disease <ul style="list-style-type: none"> <li>- I: Overview</li> <li>- II: Gut-Brain Axis and autoimmune diseases</li> </ul> </li> <li>• How the Microbiome Influences Host Diet Metabolism</li> <li>• How Diet Impacts the Microbiome</li> <li>• Pre- and Probiotics</li> <li>• Microbiota-Targeted Therapies: An Ecological Perspective</li> <li>• Tools and Models for Assessment of the Microbiome and Metabolome</li> <li>• Dietary regulation of gene function</li> <li>• Metabolic disorders</li> <li>• Working with large data sets: Strategies, Programs, Formatting</li> <li>• Functional Foods and personalised nutrition</li> <li>• Regulatory Framework &amp; Challenges</li> <li>• Systems biology</li> </ul>
<b>Teaching / learning methods</b>	Self-study, group work, student and instructor presentations, instructor lead discussions, case studies

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<b>Assessment of learning outcome</b>	1. Presentation of group work (50%) 2. Written final examination, closed book (50%)
<b>Format</b>	7-weeks
<b>Timing of the module</b>	Spring semester, CW 8-14
<b>Venue</b>	Blended learning format. Presence sequences take place in Berne
<b>Bibliography</b>	<p><u>Pre-course reading:</u></p> <ul style="list-style-type: none"> <li>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.) – <b>Free pdf download</b></li> </ul> <p><u>Selected reading (suggested):</u></p> <ul style="list-style-type: none"> <li><u>Foodomics: Omic Strategies and Applications in Food Science</u> Editor: Jorge Barros-Velázquez, Print ISBN-10: 1788018842</li> <li><u>Foodomics: Advanced Mass Spectrometry in Modern Food Science and Nutrition.</u> Editor: Alejandro Cifuentes, Print ISBN: 9781118169452</li> <li><u>Bioinformatics for High Throughput Sequencing</u> Editors: Naiara Rodríguez-Ezpeleta, Michael Hackenberg, Ana M. Aransay, Print ISBN: 978-1-4614-0781-2</li> <li><u>The Gut Microbiome in Health and Disease</u> Editors: Dirk Haller, Print ISBN: 978-3-319-90544-0</li> <li><u>Metabonomics and Gut Microbiota in Nutrition and Disease</u> Editors: Sunil Kochhar, Francois-Pierre Martin, Print ISBN : 978-1-4471-6538-5</li> </ul>
<b>Language</b>	English
<b>Links to other modules</b>	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
<b>Comments</b>	-
<b>Last Update</b>	20.08.2025