

List of Master and Bachelor Topics - Food Biotechnology 2022

Prof. Dr Ing. C. Lacroix, Institute of Food Nutrition and Health, ETH-Zurich

AE Andi Erega; **AGe** Annelies Geirnaert; **AGr** Anna Greppi; **AS** Aline Schneider; **BP** Benoit Pugin; **FC** Florentin Constancias; **JI** Julia Isenring; **JZ** Janina Zünd; **LB** Lea Bircher; **MC** Marta Cerruti; **MV** Mathieu Verpaalen; **PK** Palni Kundra; **VR** Vanesa Rocha Martin; **KY** Kun Ye

A. Nutrition and metabolic activities of food and gut microbes

- **“Gut-brain axis”** –Physiological characterization of neurotransmitters-producing gut microbes (BA/MA) –**BP/KY**
- **“B-vitamins trading in the gut microbiota”** – Investigate B9 and B12 cross-feeding among microbes from the human gut microbiome (BA/MA) – **PK/AGe**
- **“Inflammation and gut microbial metabolism”** – Characterizing the response of gut commensals to oxidative stress and redox potential alteration; contribution to the dysbiotic gut ecosystem (BA/MA) – **JZ/BP**
- **“Fighting AMR bacteria in the gut”** – Investigating the power of reuterin produced by *Lactobacillus reuteri* to inhibit the growth of antimicrobial resistant microbes in the human gut (BA/MA)- **AGr**
- **“Synbiotic: 1+1=3?”** *In vitro* study of synbiotic-pathogen-gut microbiota interactions at microscale – (BA/MA) – **AE/AGe**

B. Fermentation and downstream processes

- **“A big challenge!”** Biotechnology of next generation live biotherapeutic products of strict anaerobic gut microbes - (MA) - **FK/CL** (collaboration with Pharmabiome AG)

- **“Production of novel microbial therapeutics”** – Transform intestinal fermentation technology from laboratory scale towards a manufacturing site for artificial gut microbiota intended for therapeutic application in humans (MA) – **JJ/LB**
- **“It’s all about the blend”** – Identify the synergistic effects of fructans and human milk oligosaccharides on toddler gut microbiota using the PolyFermS colonic fermentation model – **LB**
- **“Teamwork wins”** – Designing and producing micro-beads encapsulating gut microbes as smart building blocks for gut microbial biotherapeutic production (BA/MA) - **MV/AGe**
- **“Give them vitamins”** – Impact of B vitamins on the growth, metabolism and competition of gut microbes in the PolyFermS adult colonic model– (BA/MA) –**MC**

C. Molecular characterization of food & gut microbes

- **“Microscale”** – Deciphering gut microbial interactions using *in vitro* PolyFermS beads (BA/MA) - **AS/FC/LB**
- **“Regulation of GABA-production in *B. thetaiotaomicron*”** – Functional characterization of the genes involved in the production of the neurotransmitters GABA (GAD-system) in *B. thetaiotaomicron* using genetically engineered mutants strains. (BA/MA) – **BP/KY**

Prof. Dr Christophe Lacroix, August 2022