

Marius Vital

Dr. Marius Vital joined the lab of James Tiedje at MSU as a Post-doctoral fellow beginning of 2011, after finishing his PhD on drinking water microbiology at ETH Zürich, Switzerland. His current research involves many aspects of microbial ecology and evolution with specific focus on the principles governing structure/function of the human gut microbiota. Major fermentation products such as short chain fatty acids are of particular interest and Dr. Vital is developing methods, based on both gene-targeted and '-omics' approaches, to reveal the functional diversity in those complex intestinal communities and to expose the key players. The techniques are assisting to identify specific processes promoting disease in humans and should, eventually, improve diagnostics and contribute to the development of strategies to treat disease/maintain health.

Lecture Topic

How to investigate specific functions in complex microbial communities: butyrate-synthesis in the gut microbiota as an example.

It is increasingly recognized that intestinal microbial processes are essential for maintaining host health. At MSU we develop methods such as amplicon sequencing and quantitative PCR of specific target genes as well as global metagenomic analyses to investigate microbial functions. We are specifically interested in butyrate-synthesis, which promotes epithelial integrity and intestinal homeostasis by serving as the primary energy source for colonocytes and controls local immune responses. It is postulated that imbalances in butyrate production is associated with many emerging diseases such as IBD and type 2 diabetes. The developed methods enabled us to reveal basic mechanisms and associated key players governing butyrate-synthesis in complex communities and are currently applied in several medical related projects such as the Human Microbiome Demonstration Project: "*The Gut Microbiota in Ulcerative Colitis*".