

'Functional Microbiomics': Unlocking Nutrition-Microbiome-Host Interaction with Metabolomics

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In the past years, microbiome research has dramatically reshaped our understanding of how microbes impact on a multitude of (patho-)physiological processes in the host. However, causal links between the microbiota and diseases are still lacking to a large extent. Metabolomics allows the investigation of microbial metabolic activities, and thus, is an ideal "omics" technology for assessing functional nutrition-host-microbiota crosstalk.

This presentation will provide an overview about the physiological role of the microbiome and recent advances in the analysis of the microbiota metabolome in various research disciplines including cardiology, diabetology, neuroscience and oncology. Key metabolic pathways covering a variety of target metabolites produced and/or biochemically modified by gut bacteria (with a focus on choline metabolism, bile acids, branched-chain amino acids and tryptophan metabolism) and their importance in pathophysiological processes, diseases, as well as drug response will be highlighted.

A broad targeted profiling technology, the MxP[®] Quant 500, is the worldwide first standardized solution for multiplexed, targeted quantification of up to 630 endogenous and microbiota-derived metabolites and lipids by mass spectrometry. It is applicable to a wide range of matrices, including plasma and feces, and ensures highly accurate and reproducible results.

Investigation of the functional nutrition-microbiome-host interplay is a key aspect to better understand the causal link to physiological processes, disease development, as well as response to drug treatment.