

KEYNOTE SPEAKER

Diets may affect epigenetic regulation of inflammation via short chain fatty acids of GI microbiota

Alexander G Haslberger

University of Vienna, Dep. Nutritional Sciences

E-mail: alexander.haslberger@univie.ac.at

Abstract

Colonization of the gut by bacteria plays important roles in gut cell physiology and in metabolism and increasingly recognized roles in immune system homeostasis. Differences of microbiota between individuals, with regard to factors including diet, lifestyle, use of antibiotics, prebiotics, or probiotics, and gut microbiota-generated metabolites, further influence intestinal homeostasis, metabolic, nervous system, and immune and inflammatory response pathways.

Many of the signals generated by diet and intestinal microbiota that modulate immune and inflammatory response systems are sensed by cells in and beyond the gut via pattern-recognition receptors. These include Toll-like receptors which respond to stimuli including not only microbial components, but also certain free fatty acids. Several G protein-coupled receptors (GPRs) also recognize short-, intermediate-, and long-chain fatty acids. GPR120 and GPR40, modulate inflammatory responses by sensing medium and/or long-chain fatty acids

Levels of the short-chain fatty acids acetate, butyrate, and propionate generated by gut commensal microbiota affect gut epithelial cell bioenergetics, proliferation and barrier and inflammatory functions. Short chain fatty acid levels vary not only due to microbiome composition, but also due to dietary and lifestyle factors. Significantly, butyrate and propionate enter the systemic circulation, and acetate can reach particularly high levels in the systemic circulation.

Modulation of the epigenetic regulation of GPR receptors, inflammatory mediators but also DNA repair enzymes by SCFAs will be discussed.

Biography

Alexander G. Haslberger is associate professor at the Departments of Nutritional Sciences and Microbiology and Genetics at the University of Vienna. He worked at the WHO in Geneva and organized research projects in the areas of epigenetics, environmental health and gastrointestinal microbiota. He participated in the WHO reports, the OECD conference on genetic testing, the Public Health Genomic EC network, research projects in WHO, OECD and EPA.