Role of Diet on the Gut Microbiome and Implications for Human Health

Guest Editor:

Dr. Carlotta De Filippo,
National Research Council, Institute of Agricultural Biology and Biotechnology (IBBA-CNR), Pisa, Italy.

Special Issue Introduction:

The intestinal microbiota plays a fundamental role in maintaining the health of the host organism, providing essential metabolic capacities, such as the bioavailability of nutrients, vitamins, and energy, as well as contributing to detoxification processes and resistance to infectious diseases. The intestinal microbiota is also capable of metabolizing biologically active molecules from food, which would otherwise be discarded by the intestinal tract, recovering energy, thanks to the microbiome that enriches the human body with genes involved in metabolic pathways, such as the degradation of indigestible plant polysaccharides, the fermentation of carbohydrates, producing organic acids, the biosynthesis of essential vitamins and isoprenoids and the metabolism of amino acids, proteins, lipids and, last but not least, the metabolism of xenobiotic compounds.

The intestinal microbiota is also able to influence the energy balance of the host, as demonstrated by several studies on germ-free animals (in which the microbiota is totally absent), which require 30% more energy in the normal diet to maintain the ideal weight. In fact, intestinal bacteria draw the necessary energy from the metabolism of sugars and proteins, through the fermentation process. The transformation of non-digestible dietary polysaccharides (cellulose, hemicellulose, pectin, non-digestible starch) occurs by bacterial enzymes that transform the material deriving from food into volatile substances (carbon dioxide, hydrogen sulfide) and short-chain fatty acids (SCFAs) such as acetic, butyric and propionic acid, derived from the fermentation of fibers which represent the main source of nourishment of the colon mucosa.

The composition of the human intestinal microbiota is extremely variable both between healthy people and between lean and obese individuals, as well as very sensitive to changes in the diet of the same individual producing important changes in metabolism such as the absorption, storage, and metabolism of dietary lipids, which are strictly regulated by the gut microbiota. Understanding the interactions between diet and gut microbiota is a topic of great interest in the scientific world.

This special issue aims to highlight how diet can modulate the gut microbial communities in health and disease and applications in the frame of microbiome research, allowing discussion of the latest microbiome advancements and applications in the field.

We welcome original or review manuscripts, perspectives, opinions, and commentary on different aspects of this special issue, including but not limited to:

Innovative approaches to study microbiomes:

- In vivo and in vitro models to study macro and micro-nutrient effects on gut microbiota;
- Mechanistic diet-microbiome studies in health and disease;
- Relation between different traditional dietary regimens and gut microbiota composition;
- In vitro modeling of diet-microbes modulation with metabolomics profiles;
- Meta-omics data integration, artificial intelligence, and novel simulation models in microbiome research tools;

Innovative approaches to modulate microbiomes:

- Next-generation probiotics;
- Emergent prebiotics;
- Smart and precision probiotics/prebiotics.
- Functional foods.

Submission Deadline: 31 Jan 2023

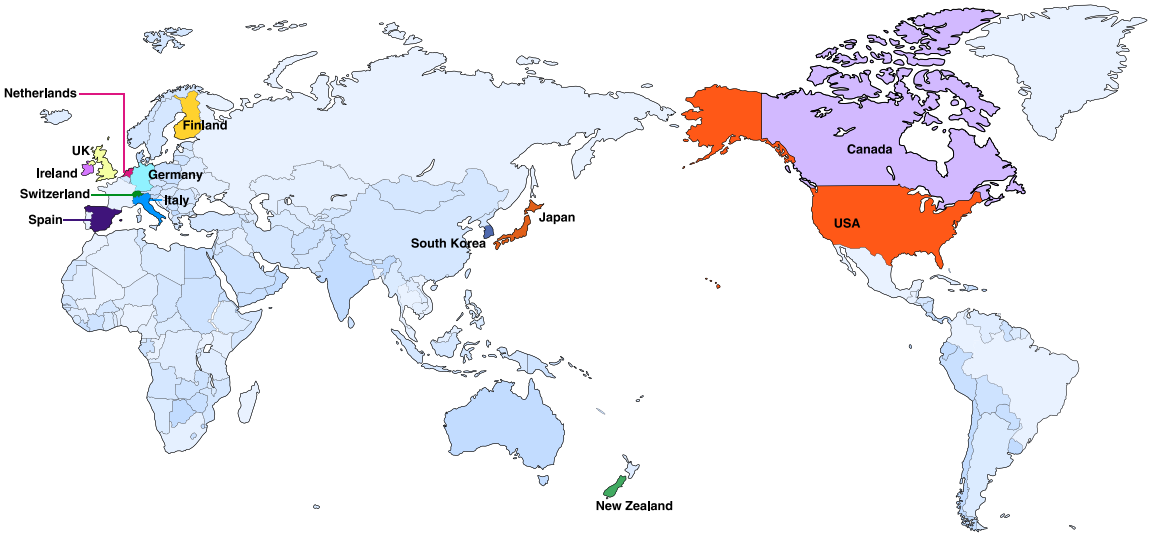
Benefits to Authors:

- The APCs ($600) will be WAIVED;
- Enjoy faster publication than regular submissions;
- Authors will be invited as Guest Speakers to our journal webinars. The webinar will be held via Zoom and it will also be broadcast live on Youtube and the Chinese WeChat Official Account, Video Account, Bilibili;
- A special interview will be provided to authors and will be promoted on the journal homepage and all media promotion platforms of both via the journal and publisher.

Journal Introduction:

Microbiome Research Reports (MRR) is an international peer-reviewed, open access journal. The overall aim of *MRR* is to publish high quality researches from scientists with a common interest in microbiome/microbiota research in all its multidisciplinary aspects. The journal is founded by OAE Publishing Inc., under the guidance of our Editor-in-Chief Professor Marco Ventura (University of Parma, Italy). *MRR* was officially launched on July 26 2021. Looking forward to your attention and cooperation! Welcome to contact the editorial office for details, editorialoffice@mrrjournal.net.

Editorial Board team:



Scan the QR code to view the journal website