Tentative Outline

Thematic Issue for the journal "Current Gene Therapy"

Title of the Thematic Issue: *__Understanding the gut microbiome: Taxonomic signatures, functional genes, and the revolution of probiotics (next-generation probiotics) in treatment of chronic diseases__*

Guest Editor: Jodi Law Woan-Fei

• **Scope of the Thematic Issue:**

The gut microbiome plays an essential role in maintaining our health and the development of diseases. There is an increasing expansion of research in deciphering the mechanisms of gut microbiome-host interactions in modulating diseases. The gut microbiome provides protection to the host by microbe-generated metabolites that could regulate immune homeostasis. Therefore, the disruption to the balance of the gut microbiome could trigger disease development and jeopardize the host's health. The advanced technologies in the -omics era have provided excellent opportunities for researchers to explore the gut microbial community. The availability of whole genome sequencing, metagenomics, and metatranscriptomics offers new insights into gut microbiome through taxonomic and functional profiling. This also enables the identification of microorganisms as microbial biomarkers in disease diagnosis and prognosis. Furthermore, genetic and genomic tools have facilitated the characterization of microbes with probiotic properties from commensal microbiota, which are referred to as the "next-generation probiotics". These microorganisms have never been used as probiotic agents, and they serve as a modern approach to disease prevention and treatment. Apart from next-generation probiotics, the development of genetically engineered probiotics with enhanced probiotic traits is also an ongoing approach.

This thematic issue aims to contribute knowledge on the roles of gut microbiome composition and functional gene signature associated with the pathogenesis and treatment of chronic diseases, including metabolic diseases, cancers, and gastrointestinal disorders, through the application of genetic and genomic tools. This issue also gathers information on the recent developments of next-generation probiotics and genetically engineered probiotics as microbiome-based therapies for these diseases. We welcome comprehensive reviews and original research submissions for this Thematic issue to offer exciting updates on understanding the roles of gut microbiome and probiotics in treating chronic diseases.

Keywords: gut microbiome; probiotic; next-generation probiotic; genetically engineered probiotic; metagenomic; dysbiosis; chronic disease; diabetes; cancer; obesity; inflammatory bowel diseases

Sub-topics:

➢ Gut microbiome profile and gut microbiota markers of chronic diseases
➢ Gut microbiome taxa and functional gene composition in chronic disease
➢ Emerging next-generation probiotics for the treatment of chronic diseases
➢ Genetically engineered probiotics for the treatment of chronic diseases

Tentative titles of the articles and list of contributors:

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Schedule:

✧ Thematic issue submission deadline: 31 December 2023

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