

Gut microbiome as a target in dietetic practice

Summary

The human gut microbiome comprise over a trillion microbial cells. Improvements in technologies to characterise this ecosystem have advanced our understanding of the association of the microbiome with health and disease. Although these new advances are exciting, they present challenges to dietitians who are faced with an ever-increasing number of research studies to read and interpret, and are required to respond to questions from patients regarding the potential of microbiome modification to ameliorate disease.

The composition of the microbiome are described in vastly different ways, for example, reporting at the phyla, genera, species and strain level. Other approaches to categorizing the microbiome include “enterotypes”, which are discrete clusters of bacterial communities in the gut based upon the predominance of key species.

Probiotics and prebiotics have been used for many years to modify the microbiome. The extent to which the microbiome can be altered by these dietary components is still emerging, including wide inter-individual variation in response.

Both irritable bowel syndrome (IBS) and inflammatory bowel disease (IBD) are characterised by altered luminal and mucosal colonic microbiota, however, their responsiveness to microbiome-modifying treatment differs. Furthermore, the role of the microbiome on health extends beyond the gut, with studies showing altered microbiome in people with depression and more than 20 clinical trials of probiotics as therapeutic agents.

The symposium will review: (i) the composition of the gut microbiome, its relevance to health and disease and methods of manipulation; (ii) how the microbiome are altered in key disorders relevant to dietetic practice (e.g. IBS, IBD, depression); and (iii) the evidence for microbiota-modifying interventions (diet, probiotics, prebiotics) in key areas of relevance to dietetics.

Keywords

microbiome, gastroenterology, irritable bowel syndrome, inflammatory bowel disease, depression, mental health

Learning outcomes

1. To understand the composition of the gut microbiome, its relevance to health and disease and methods of manipulation
2. To understand how the microbiome are altered in key disorders relevant to dietetic practice (e.g. IBS, IBD, depression).

3. To have a critical understanding of the evidence for microbiota-modifying interventions (diet, probiotics, prebiotics) in key areas of relevance to dietetics

Programme

10:00 (25 mins)	Microbiome 101: what are the gut bacteria, what do they do and how can they be modified by diet, probiotics and prebiotics? Professor Kevin Whelan RD, King's College London
10:25 (20 mins)	Microbiome in irritable bowel syndrome and approaches to modifying it in dietetic practice Dr Heidi Staudacher RD, Deakin University, Australia
10:45 (15 mins)	Microbiome in inflammatory bowel disease, probiotics, prebiotic and FMT Dr Caroline Tuck APD, LaTrobe University, Australia
11:00 (15 mins)	Mental health and depression: can diet manipulate the microbiome to impact the brain? Dr Megan Rossi RD, King's College London

Biographies

Professor Kevin Whelan

Kevin Whelan is the Professor of Dietetics and Head of the Department of Nutritional Sciences at King's College London, United Kingdom. Professor Whelan is a Principal Investigator leading a research programme exploring the interaction between diet, the gastrointestinal microbiota and health and disease. He has undertaken numerous multi-centre investigations of the microbiota in patients with inflammatory bowel disease, irritable bowel syndrome and patients receiving artificial nutrition, and the use of diet to modify these. He has published over 170 peer-reviewed papers on the topics of fibre, probiotics, prebiotics and FODMAPs. He is the Series Editor of the BDA book series 'Advanced Nutrition and Dietetics' which consists of four books on Gastroenterology, Diabetes, Obesity and Nutrition Support and on the editorial board of the Journal of Human Nutrition and Dietetics and Alimentary Pharmacology and Therapeutics. In 2012 he was awarded the Nutrition Society Cuthbertson Medal for clinical nutrition, in 2017 was appointed a Fellow of the British Dietetic Association and in 2018 delivered the Dr Elsie Widdowson Memorial Lecture.

Dr Heidi Staudacher

Heidi Staudacher is an accredited practising dietitian with experience in the clinical management of disorders of gut-brain interaction (DGBI). She is an Alfred Deakin Postdoctoral Research Fellow at the Food & Mood Centre at Deakin University in Melbourne, Australia and leads the dietary trials stream with the centre. Her PhD at King's College London, United Kingdom, investigated dietary interventions in irritable bowel syndrome, including their impact on the gastrointestinal microbiome, and was supported by

a prestigious NIHR Clinical Doctoral Fellowship. Her primary research focus includes investigating the pathophysiology and dietary management of DGBI, the role of diet in DGBI with mental health comorbidity, and diet-microbiome interactions in these disorders. Her research program has significantly expanded knowledge on IBS treatment and underpins several clinical guidelines globally. She is a 2021 Griffith University Discovery Award finalist.

Dr Caroline Tuck

Caroline Tuck is a Lecturer in the Department of Dietetics and Human Nutrition at La Trobe University, Melbourne, Australia. She is an Accredited Practising Dietitian with a broad range of clinical experience. Caroline completed her PhD in 2017 with the Department of Gastroenterology at Monash University Melbourne, after which she conducted a post-doctoral research fellowship with the Gastrointestinal Diseases Research Unit at Queen's University in Canada. Her research focuses on nutrition intervention in patients with gastrointestinal conditions. This has included studies from bench to bedside, including multiple clinical trials as well as basic science projects to provide mechanistic understanding. Caroline was a co-author on the World Gastroenterology Organisation 'Diet and the Gut' guidelines, and she has received several research awards, including a prestigious Canadian Institutes of Health Research Post-Doctoral Fellowship grant and the Award of excellence in Nutrition and Dietary Fibre research from the Nutrition Society of Australia.

Dr Megan Rossi

Megan Rossi is a Registered Dietitian with a PhD in gut health from the Faculty of Medicine and Biomedical Sciences at the University of Queensland, Australia. Megan's PhD was recognised for its contribution to science receiving the Dean's Award for excellence. Megan is a Research Fellow at King's College London investigating nutrition-based therapies in gastrointestinal health, including prebiotics and probiotics, dietary fibres, the low FODMAP diet and food additives. Megan was the recipient of the 2017 British Medical Journal Open Gastroenterology prize 'Best clinical science abstract for oral presentation' and the British Nutrition Foundation 'Drummond Pump Priming Award'. Megan also founded The Gut Health Clinic where she continues to practice alongside a team of gut specialist dietitians.