Gut Microbiota for Health Expert Panel Charter

A cross disciplinary education & interest group under the auspices of the British Society of Gastroenterology (BSG Research Committee)

Mission Statement

- To help increase awareness and understanding among clinicians of the gut microbiota and its impact on health
- To be a 'go-to' address for UK clinicians (GPs, gastroenterologists, nurses, and allied health professionals) for defining what is currently reliably known in this field
- To drive scientific and clinical interest in the gut microbiota in gastrointestinal and liver disease

Objectives

- To facilitate the sharing of knowledge on the gut microbiota between academics, clinicians and researchers
- To map the science and reach consensus on what is known and what is not yet known
- To draft consensus statements on areas of interest for UK GPs
- To identify gaps in knowledge and research foci
- To identify R&D areas in this field that would advance understanding and lead to patient benefit
- To develop guidelines to ensure the safe and effective manipulation of the gut microbiota for therapeutic purposes (e.g. faecal microbiota transplantation (FMT) and responsible antibiotic use)

Funding

The panel members meet twice a year. The BSG covers costs for secretariat support. Funding for specific projects is subject to separate agreement.

Current Focus

- To continue to advise on the governance of FMT in the UK, to adapt current protocols for SARS-CoV-2 detection, and to set up a UK registry of groups conducting FMT
- To distribute the gut microbiome (poo) leaflet to primary healthcare professionals
- To publish an academic review explaining the methods used in commercial microbiome tests and the level of supporting evidence for any associated health advice
- To publish an academic review on how the gut microbiota influences drug efficacy
- To collaborate on producing educational material on the gut microbiota for clinicians
- To organise expert workshops, for clinicians and researchers
- To explore new themes:
    - Optimum pre-surgery regimes relating to the gut microbiota (e.g. dietary advice, probiotics etc)
    - The involvement of the gut microbiota in antimicrobial resistance
    - The diagnostic potential of the gut microbiota biomarkers
    - The involvement of the gut microbiota and long Covid
    - The paediatric gut microbiota

Focus Areas: selected recent papers of interest

Cancer and the gut microbiome (Lead: Julian Marchesi)

- Darnindro N et al(2025) Differences in diversity and composition of mucosa-associated colonic microbiota in colorectal cancer and non-colorectal cancer in Indonesia. *World J Gastroenterol.* ;31(7):100051.
- Wang N, et al (2025). Intratumoral microbiome: implications for immune modulation and innovative therapeutic strategies in cancer. *J Biomed Sci.* 19;32(1):23.
- Zhang *et al (2024)* A gut microbiota rheostat forecasts responsiveness to PD-L1 and VEGF blockade in mesothelioma. *Nat Commun* 15, 7187.
- Zeng *et al* (2024) Stomach microbiota in gastric cancer development and clinical implications. *Gut* doi: 10.1136/gutjnl-2024-332815
- Zepeda-Rivera *et al.* (2024) A distinct *Fusobacterium nucleatum*clade dominates the colorectal cancer niche. *Nature* **628**, 424–432.
- Roje *et al.* (2024) Gut microbiota carcinogen metabolism causes distal tissue tumours. *Nature* **632**, 1137–1144.
- Ebrahimi *et al.* (2024) Cabozantinib and nivolumab with or without live bacterial supplementation in metastatic renal cell carcinoma: a randomized phase 1 trial.*Nat Med* **30**, 2576–2585.

Diet and nutritional interventions (Lead: Ian Rowland)

- Lerma-Aguilera A M et al (2024) Effects of different foods and cooking methods on the gut microbiota: an *in vitro* approach. *Frontiers in Microbiology* 14.
- Wolter M et al (2024) Diet-driven differential response of *Akkermansia muciniphila* modulates pathogen susceptibility. *Mol Syst Biol* 20(6):596-625.
- Taglialegna, A. (2025) A gut microbiome-restoring diet. *Nat Rev Microbiol* (2025).
- Looijesteijn et al (2024) A double-blind intervention trial in healthy women demonstrates the beneficial impact on *Bifidobacterium* with low dosages of prebiotic galacto-oligosaccharides. Frontiers in Nutrition 11.
- Medawar *et al* (2024) Prebiotic diet changes neural correlates of food decision-making in overweight adults: a randomised controlled within-subject cross-over trial. *Gut* **73:**298-310.
- Khavandegar *et al.* (2024) Adherence to the Mediterranean diet can beneficially affect the gut microbiota composition: a systematic review. *BMC Med Genomics* **17**, 91.
- Ross, F.C., Patangia, D., Grimaud, G. *et al.* The interplay between diet and the gut microbiome: implications for health and disease. *Nat Rev Microbiol* **22**, 671–686 (2024).

Faecal Microbiota Transplantation (FMT) (Lead: Tariq Iqbal)

- Chen-Liaw, A., Aggarwala, V., Mogno, I. *et al.* Gut microbiota strain richness is species specific and affects engraftment. *Nature* 637, 422–429 (2025).
- Ghani R, et al (2024). Faecal (or intestinal) microbiota transplant: a tool for repairing the gut microbiome. *Gut Microbes.* 6(1):2423026.
- Mullish et al (2024) The use of faecal microbiota transplant as treatment for recurrent or refractory Clostridioides difficile infection and other potential indications: second edition of joint British Society of Gastroenterology (BSG) and Healthcare Infection Society Guidelines. J Hosp Infect 148:189-219
- Video of the updated guidelines
- Overview of the updated guidelines
- Yadegar et al (2024) Fecal microbiota transplantation: current challenges and future landscapes. Clin Microbiol Rev 37:e00060-22.

Gut-brain axis (Lead: Debbie Shawcross)

- Loh, *et al.* (2024) Microbiota–gut–brain axis and its therapeutic applications in neurodegenerative diseases. *Sig Transduct Target Ther* 9, 37.
- Bruggeman **(2024)** Safety and efficacy of faecal microbiota transplantation in patients with mild to moderate Parkinson's disease (GUT-PARFECT): a double-blind, placebo-controlled, randomised, phase 2 trial. *EClinicalMedicine.* 71:102563.
- Kolobaric et al. (2024) Gut microbiome predicts cognitive function and depressive symptoms in late life. *Mol Psychiatry* 29, 3064–3075.
- Taglialegna, A (2024) Feeling the blues with *Parabacteroides*. *Nat Rev Microbiol* https://doi.org/10.1038/s41579-024-01016-2
- Xie, et al (2024) Integrated multi-omics analysis reveals gut microbiota dysbiosis and systemic disturbance in major depressive disorder. *Psychiatry Research* 334: 115804 ISSN 0165-1781,

Gut microbiome (general) (Lead: Julian Marchesi)

- Radlinski, L.C., Bäumler, A.J. (2025) Microbiome science needs more microbiologists. *Nat Microbiol* 10, 263–264.
- Willis, A.D., Clausen, D.S. Planning and describing a microbiome data analysis. *Nat Microbiol* (2025).
- Van Hul et al (2024) What defines a healthy gut microbiome? Gut doi:10.1136/gutjnl-2024-333378.
- The Human Gut Microbiome Atlas
- Lee et al (2024) Global compositional and functional states of the human gut microbiome in health and disease. *Genome Res.* 34(6):967-978. doi: 10.1101/gr.278637.123.
- WHO/BS/2022.2416: A WHO collaborative study to evaluate the candidate 1st WHO International Reference Reagents for Gut Microbiome analysis by Next-Generation Sequencing
- WHO/BS/2023.2455 WHO 1st Reference Reagent for DNA extraction of gut microbiome
- Chen-Liaw et al (2024) Gut microbiota strain richness is species specific and affects engraftment. *Nature*

Gut virome

- Tian *et al.* (2024) Gut virome-wide association analysis identifies cross-population viral signatures for inflammatory bowel disease. *Microbiome* 12, 130.
- Zeng *et al.* (2024) A metagenomic catalog of the early-life human gut virome. *Nat Commun* 15, 1864.
- Veldsman et al (2024) Structural and Functional Disparities within the Human Gut Virome in Terms of Genome Topology and Representative Genome Selection. Viruses 16(1):134.
- Talarico et al (2024) The effects of stress on gut virome: Implications on infectious disease and systemic disorders. *Microbiologyopen* 13(5):e1434. doi: 10.1002/mbo3.1434.
- Ritz, N.L., *et al.* The gut virome is associated with stress-induced changes in behaviour and immune responses in mice. *Nat Microbiol* 9, 359–376 (2024).

Infectious disease (including antimicrobial resistance) (Lead: Vishal Patel)

- Davido B et al (2025) How can the gut microbiome be targeted to fight multidrug-resistant organisms? *The Lancet Microbe*
- Marcelo et al. (2024) Mining human microbiomes reveals an untapped source of peptide antibiotics. *Cell*, 2024; DOI: 10.1016/j.cell.2024.07.027
- Garcia-Santamarina et al (2024) Emergence of community behaviors in the gut microbiota upon drug treatment. Cell, (Better together: gut microbiome communities' resilience to drugs | EMBL)
- Furuichi *et al.* (2024) Commensal consortia decolonize Enterobacteriaceae via ecological control. *Nature* **633**, 878–886. (Gut microbes fend off harmful bacteria by depriving them of nutrients (nature.com))
- Merrick B et al (2023) Modulation of the Gut Microbiota to Control Antimicrobial Resistance(AMR)-A Narrative Review with a Focus on Faecal Microbiota Transplantation (FMT). *Infect Dis Rep.* 15(3):238-254.
- Cunningham & Harris (2023). Gut microbial analysis and faecal transplantation to improvesurgical outcomes. *Br J Surgery* 110: 757-764.
- Zampaloni, C *et al.* (2024) A novel antibiotic class targeting the lipopolysaccharide transporter. *Nature* **625**, 566–571.

Inflammatory bowel disease (Leads: Georgina Hold & Ailsa Hart)

- Quraishi Mnet al (2025) Open Label Vancomycin in Primary Sclerosing Cholangitis-Inflammatory Bowel Disease: Improved Colonic Disease Activity and Associations With Changes in Host-Microbiome-Metabolomic Signatures. *J Crohns Colitis.*
- Wyatt NJ et al (2025) Evaluation of intestinal biopsy tissue preservation methods to facilitate large-scale mucosal microbiota research. *EBioMedicine.* 112:105550.
- Zheng, J., Sun, Q., Zhang, M. *et al.* Noninvasive, microbiome-based diagnosis of inflammatory bowel disease. *Nat Med* (2024).
- Bethlehem et al (2024) Microbiota therapeutics for inflammatory bowel disease: the way forward, *Lancet Gastro Hepatol* 9(5) 4760486.
- Zhou H et al (2024) Lupus and inflammatory bowel disease share a common set of microbiome features distinct from other autoimmune disorders. *Annals of the Rheumatic Diseases*
- Katsoudas N et al (2024) Dietary Emulsifier Exposure in People With Inflammatory Bowel Disease Compared With Healthy Controls: Is There a Cause for Concern? *Inflamm Bowel Dis* doi:10.1093/ibd/izad318.

Irritable bowel syndrome (Lead: Julie Thompson)

- Uriot O et al (2025) Gut microbial dysbiosis associated to diarrheic irritable bowel syndrome can be efficiently simulated in the Mucosal ARtificial COLon (M-ARCOL). *Bioengineered.* 16(1):2458362.
- Tunali V, et al (2024). A Multicenter Randomized Controlled Trial of Microbiome-Based Artificial Intelligence-Assisted Personalized Diet vs Low-Fermentable Oligosaccharides, Disaccharides, Monosaccharides, and Polyols Diet: A Novel Approach for the Manage
- Sarkawi, M. *et al.* A randomized, double-blinded, placebo-controlled clinical trial on Lactobacillus-containing cultured milk drink as adjuvant therapy for depression in irritable bowel syndrome. *Sci Rep* 14, 9478 (2024).
- Chen Y et al (2024). Gut microbiota and intestinal immunity-A crosstalk in irritable bowel syndrome. *Immunology.* 172(1):1-20.

Liver (Lead: Debbie Shawcross)

- Lee, Sunjae et al (2024) Oral-gut microbiome interactions in advanced cirrhosis: characterisation of pathogenic enterotypes and salivatypes, virulence factors and antimicrobial resistance. *J Hepatology* in press
- Dalby MJ et al (2025) Pathological expansion of gut microbiome-associated *Enterococcus* in advanced cirrhosis corresponds with multilevel perturbations of the gut-liver-immune axis medRxiv
- Jin Y, et al. (2024) Silymarin decreases liver stiffness associated with gut microbiota in patients with metabolic dysfunction-associated steatotic liver disease: a randomized, double-blind, placebo-controlled trial. *Lipids Health Dis.*;23(1):239.
- Liu J, MacNaughtan J, Kerbert AJC, *et al.* Clinical, experimental and pathophysiological effects of Yaq-001: a non-absorbable, gut-restricted adsorbent in models and patients with cirrhosis. *Gut* 2024;**73:**1183-1198.
- Lee S (in press) Pathogenic entero- and salivatypes harbour changes in microbiome virulence and antimicrobial resistance genes with increasing chronic liver disease severity. *bioRxiv*
- Lee S et al (2024) Oral-gut microbiome interactions in advanced cirrhosis: characterisation of pathogenic enterotypes and salivatypes, virulence factors and antimicrobial resistance. J Hepatol (in press)

- Ha S *et al.*(2024) Interplay between gut microbiome, host genetic and epigenetic modifications in MASLD and MASLD-related hepatocellular carcinoma. *Gut* 74(1):141-152

Metabonomics (Lead: Jonathan Swann)

- Vich Vila A, Zhang J, Liu M*, et al*. Untargeted faecal metabolomics for the discovery of biomarkers and treatment targets for inflammatory bowel diseases. *Gut* 2024;73:1909-1920.
- Mohr, A.E., Sweazea, K.L., Bowes, D.A. *et al.* Gut microbiome remodeling and metabolomic profile improves in response to protein pacing with intermittent fasting versus continuous caloric restriction. *Nat Commun* 15, 4155 (2024).
- Sun H, et al (2024). Integrated metagenomic and metabolomic analysis reveals distinctive stage-specific gut-microbiome-derived metabolites in intracranial aneurysms. Gut. 73(10):1662-1674.
- Roje, B., Zhang, B., Mastrorilli, E. *et al.* Gut microbiota carcinogen metabolism causes distal tissue tumours. *Nature* 632, 1137–1144 (2024).
- Little AS et al (2024) Dietary- and host-derived metabolites are used by diverse gut bacteria for anaerobic respiration. *Nat Microbiol* 9(1):55-69.
- Kang WK et al (2024) Vitamin B_{12}produced by gut bacteria modulates cholinergic signalling. *Nat Cell Biol*. 26(1):72-85.

Paediatrics (Lead: Richard Hansen)

- Gutierrez, M.W., van Tilburg Bernardes, E., Ren, E. *et al.* Early-life gut mycobiome core species modulate metabolic health in mice. *Nat Commun* 16, 1467 (2025).
- Orchanian SB, Hsiao EY (2025) The microbiome as a modulator of neurological health across the maternal-offspring interface. *J Clin Invest.* 135(4):e184314.
- Boulund U et al (2025) The role of the early-life gut microbiome in childhood asthma. *Gut Microbes*. 17(1):2457489.
- Shao, Y., Garcia-Mauriño, C., Clare, S. *et al.* Primary succession of Bifidobacteria drives pathogen resistance in neonatal microbiota assembly. *Nat Microbiol* 9, 2570–2582 (2024).
- Frerichs NM et al (2024). Microbiome and its impact on fetal and neonatal brain development: current opinion in pediatrics. Curr Opin Clin Nutr Metab Care. 27(3):297-303.
- Beck, L.C., Berrington, J.E. & Stewart, C.J. Impact of probiotics on gut microbiome of extremely preterm or extremely low birthweight infants. *Pediatr Res* (2024).
- Conrad MA, et al (2024). The intestinal microbiome of inflammatory bowel disease across the pediatric age range. Gut Microbes.16(1):2317932.
- Bohn et al (2024) Associations of gut microbiota features and circulating metabolites with systemic inflammation in children. *BMJ Open Gastroenterol.* 11(1):e001470.

Primary Care (Lead: Jamie Dalrymple)

- Lancet Editorial (2024) Direct-to-consumer microbiome testing requires regulation. *Lancet Gastro Hepatol* 9 (7) P583.
- Van Hul et al (2024) What defines a healthy gut microbiome? Gut doi:10.1136/gutjnl-2024-333378.
- Ford AC et al ((2023) Amitriptyline at Low-Dose and Titrated for Irritable Bowel Syndrome as Second-Line Treatment in primary care (ATLANTIS): a randomised, double-blind, placebo-controlled, phase 3 trial. The Lancet, 402, 1773 – 1785.
- Koutoukidis et al (2022) The association of weight loss with changes in the gut microbiotadiversity, composition, and intestinal permeability: a systematic review and meta- analysis. *Gut Microbes.* 14(1):2020068.
- Mullish BH et al (2020) The gut microbiome: what every gastroenterologist needs toknow. *Frontline Gastroenterol.* 12(2):118-127.