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ABSTRACT BOOK

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like Crohn's disease and diabetes. Diet is a major regulator of the human gut microbiome composition and function. Early in life differences occur in the gut microbiome of breastfed compared with bottle-fed children, and it is notion that early gut colonization may influence long-term health. However, the role of diet in the causal pathway between the gut microbiome and disease can be very complex. Differences in the gut microbiome of obese people have been observed, but it is unclear if these are primary obesity initiators or simply the secondary effects of hyperphagia. Likewise in patients with coeliac disease, it is unclear if the gut microbiome plays a role in the disease underlying pathogenesis or any changes observed are the effect of treatment with gluten-free diet. An exciting area of future research is whether we can use microbial signatures as prognostic markers of adverse disease outcomes in condition, like intestinal failure, and also if dietary manipulation of the gut microbiome can control disease activity outcomes in patients with Crohn's disease and ulcerative colitis.

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The gut microbiota plays a central role in the attention deficit/hyperactivity disorder (ADHD)

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The gut-brain axis (GBA) is the bidirectional cross-talk between the gut microbiome and the central nervous system with the gut microbiota being the key regulator. The GBA axis includes nerve, neuroendocrine, and immune pathways, highlighting its central role in diverse neuropsychiatric disorders such as the attention deficit/hyperactivity disorder (ADHD). Today ADHD is the most prevalent neurodevelopmental disorder with unknown aetiology and extremely challenging diagnosis and treatment.

Compelling evidence supports a strong link between the gut microbiota and ADHD development. Gut microbiota has a great impact on the immune and neuroendocrine systems during the developmental critical periods in childhood when the ADHD onset occurs. Gut microbiota can directly or indirectly produce neuromodulators, like dopamine and serotonin, that can control dysfunctional behaviors and emotional regulation in ADHD. Additionally, patients with ADHD commonly manifest gastrointestinal symptoms, have an altered intestinal microbial genera, and specific dietary food known to modulate gut composition correlates with ADHD risk. Children with ADHD have significantly lower levels of omega-3 PUFAs and omega-3 PUFAs supplementation improves their inattention and hyperactivity symptoms by influencing their gut microbiota.

Modern life and its consequent changes in the dietary food, habits and lifestyles, have greatly impacted the gut flora increasing the neuropsychiatric disorder risk. Manipulations of the gut microbiome represent a promising therapeutic and preventive target in ADHD onset and development.

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Differences in bacterial community composition between healthy and polyps-related gut biopsies

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Although it is known that human gut (HG) microbiome diversity displays differences between healthy and non-healthy individuals, differences between healthy and pathogenic tissues on the same individual are not well studied. Here, we tried to examine these changes in correlation with different large intestine (LI) parts and the presence of different types of polyps and lesions. Flexible sigmoidoscopy or colonoscopy biopsies from macroscopically normal and abnormal tissues (polypoid), along with medical records, were collected from 16 individuals (mean age 67.8 ± 6.02 years, average BMI 24.7 ± 64.00 kg/m^2) from Ippokrateio general Hospital of Thessaloniki (Gastrenterology Lab) and 'Konstantopouleio – Patission' General Hospital. Tissue DNA extraction and illumina sequencing using bacteria specific primers were performed, followed by taxonomic and statistical analysis. All samples were characterized by the dominance of Firmicutes, Proteobacteria, Bacteroidetes and Actinobacteria that are the main Phyla observed in HG. However, differences were observed between different LI parts as well as between healthy and polyps gut tissues. Cluster analysis based on Horn similarities exhibited low similarities between individuals (<60%) while small polyps (<0.8 cm) samples along with the respective healthy tissues from sigmoid and rectum were grouped with similarities >50%, similarly to respective samples from the cecum. The rest of the samples including large and low dysplasia polyps along with the respective healthy tissues were grouped in separate pairs or small groups and exhibited much lower similarities. Taxonomic analysis revealed several genera that were prevalent and were significantly different between groups. Lachnospiraceae species and Blautia were increased in cecum samples, while in sigmoid and rectum samples Bacteroides was more prevalent. For the large polyps and lesion samples, bacteria such as Streptococcus and Staphylococcus, common in human microbiome, were disproportionally increased in lesion biopsies probably due to their ability to enhance host cell proliferation. In some lesion cases, species such as Methylorubrum, Terrisporobacter or Finegoldia, were found to be significantly enhanced. Most importantly, these species were also enhanced in the respective healthy samples, implying their importance for potential biomarkers for precancerous stages.

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Feeding the food allergy child

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Food allergy represents a substantial health problem in childhood. Over 90% of food allergies are caused by: eggs, peanuts, cow's milk, soy, nuts, shellfish, fish, or wheat. Diet plays a crucial role in both the prevention and management of food allergy. The maternal diet, the microbiome and early life feeding have been investigated for the prevention of allergic diseases. Allergic reactions to foods impair an individual's health and quality of life. The report of poor growth in children with food allergy is relatively common and is generally attributed to the number of foods excluded and the duration of the diet. An impaired growth in atopic children should not be attributed only to a high number of allergens and foods to