

## Microbiota and gas related complaints

Francisco Guarner, Teknon Medical Centre, Barcelona, Spain

A healthy diet rich in vegetables and legumes may induce mild abdominal discomfort. In some individuals, however, symptoms include abdominal bloating, pain, and excessive evacuation of gas per anus. We investigated the relationships among diet, abdominal sensations, gas evacuation and colonic microbiota in healthy individuals and in patients complaining of flatulence. In patients, meal-induced symptoms such as bloating, distention and pain, were found to be linked with microbial instability. The diet rich in fermentable vegetables induced abdominal symptoms, and patients' gut microbiotas developed instability in composition, exhibiting variation in abundance of the dominant genera and reduction of microbial diversity. In contrast, healthy subjects showed minor or no symptoms and their gut microbiotas were stable. In patients, but not in healthy individuals, the volume of gas evacuated correlated with abundance of *Bilophila wadsworthia* in fecal samples. This species is bile-tolerant and generates hydrogen sulfide, which is an irritating gas that might induce symptoms. The study suggested that symptomatic responses may be due to insufficient adaptation of gut microbial metabolic networks for processing food substrates.

A common therapeutical approach to manage functional abdominal symptoms is the avoidance of foods that contain fermentable oligosaccharides, disaccharides, monosaccharides and polyols, called low "FODMAP" diet. The approach is successful in reducing symptoms, but does not provide permanent relief. We compared the effects of a prebiotic supplement plus a placebo diet (Mediterranean-type diet) to a placebo supplement plus a diet low in FODMAPs in patients with IBS. The intervention had opposite effects on fecal microbiota composition in the two groups. *Bifidobacterium* spp. increased in the prebiotic group and decreased in the low-FODMAP group, whereas *Bilophila wadsworthia* (a sulfide producing species) decreased in the prebiotic group and increased in the low-FODMAP group. The prebiotic option may provide better opportunities for adaptation of the microbiome to process food substrates.