Probiotics as modulators of human gut microbiota

For the past years human gut microbiota has attracted researcher's attention. It is now known that human gut microbiota is involved in several chronic diseases like, obesity, allergies and even on neuropsychiatric disorders. An unbalance of the gut microbiota (dysbiosis) can originate gut inflammation and subsequently lead to the development of a disease. The human gut is colonised by complex ecosystem of microorganisms, comprising virus, archaea, fungi, and other eukaryotes but mainly by bacteria[1,2] with approximately 50 bacterial phyla and about 100-1000 bacterial species[3], being the most predominant anaerobic bacteria like Firmicutes and Bacteroidetes and also Proteobacteria, Verrumicrobia and Actinobacteria[4–6]. This microbial community has several functions, from protection against pathogens, to the regulation of the immune systems enhancing protection[4,7] , metabolic and structural functions. The human gut microbiota community is a dynamic, as it can adjust to different environments[3] Although, as described by Lozupone *et al*[8] and Adak *et al*[9] a positive feedback can disrupt the cooperation within the microbial community, which can lead to the development of a specific immune response, being the onset of health issue. There is scientific evidence that probiotic and prebiotic can help to deal with the so-called plague of the 21st century, food poisoning, obesity, allergy, cardiovascular diseases and cancer.[10] Probiotic, which means "for life", have an impact on the resident microbiota, intestinal epithelium cells and the immune system[11]. As an example, it been demonstrated that parietal microbiota can be changed by probiotics, influencing systemic metabolism like insulin resistance[12]. All these new findings, demonstrate the ability to modulate the colonizing gut microbiota in order to overcome particularly health issue. Even though, must more research is required, particularly the development of new and complex dynamic gut mimic systems.

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