

March 14-15th, 2015, Barcelona

Fact sheet #5

Nutrition and intestinal health: We are what we eat

Diet, the gut microbiota and digestive health are mutually intertwined. These links and the beneficial potential of probiotics were among the top issues of the Gut Microbiota for Health World Summit that took place in Barcelona, March 14-15, 2015.

The role, that the gut microbiota plays for digestion, metabolism and intestinal health can hardly be overestimated. Many of the 20.000 single functions that have been attributed to intestinal microbes are linked to digestion. These gut bacteria are powerful helpers as they

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have enzyme-encoding genes that the cells of the digestive system are missing. This enables them to extract energy from food components that are inaccessible for the cells of the human body. This applies, for example, to the metabolisation of carbohydrates that the gut cells cannot break down to

make use of. Some of these bacterial species can switch between different kinds of nutritional sources while others are more specialized. Certain bacteria are also able to produce vitamins and minerals. Studies with germ-free mice make clear how indispensable the gut microbiota is: In contrast to mice with a normal gut microbiota these animals require an extraordinarily large and diverse supply of nutrients as energy sources in order to maintain their health and body weight.

Diet can change the gut microbiota

But the interaction between diet and gut microbiota is mutual: As the microbiota acts on the digested nutrients, the food, in reverse, has a major impact on the gut microbial system. Its metabolic activities depend to a large extent on the amount and proportion of non-digestible carbohydrates and proteins reaching the intestine. Moreover, diet patterns that remain stable over long periods not only influence such momentary intestinal activities, but also help shape the gut microbiota's composition. Animal trials as well as investigations of human gut microbiota samples show that dietary changes can induce changes of the microbial

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composition. Taking into account that the gut microbiota impacts not only digestion but also the intestinal health in general as well as the immune system and even brain functions it is fair to say that to a considerable extent “we are what we eat”. So, diet is a key issue when it comes to preserve gastrointestinal health, because by eating and digesting we feed also our gut microbiota and thus influence its diversity and composition. If this balance is disturbed, a number of disorders, including metabolic conditions as well as functional and inflammatory bowel disorders and other immune mediated diseases might result. Although a disrupted microbial equilibrium can have many causes – infectious pathogens or use of antibiotics

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among them – the role of nutrition and lifestyle is crucial.

A balanced diet pays off as it supports the formation and maintenance of a well-composed microbial community, where the

different bacteria species live in a system of “checks and balances”. One way to help approach this goal is the use of prebiotics and probiotics, which are two widely studied elements in the field of gut microbiota. As both have beneficial effects nutritional experts highlight the importance of including them in our diet. Prebiotics are indigestible components of the diet that serve as food for some beneficial bacteria and thus can promote their growth. One example of a prebiotic is inulin, which is found in chicory and artichokes. Probiotics are “live microorganisms that, when administered in adequate amounts, confer a health benefit on the host”, according to the definition that the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) approved in 2001.

Scientifically assessing probiotics

Recently, the International Scientific Association for Probiotics and Prebiotics (ISAPP) – a nonprofit collaboration of leading scientists dedicated to promote research and information exchange on probiotics and prebiotics – convened an expert panel whose task it was to develop recommendations for the scope and appropriate use of the term “probiotic” in the light of recent advances in science and applications. The panel agreed upon a consensus statement comprising a number of points, one of which is that the FAO/WHO definition has

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proven to be useful and should be maintained. “However, the subtleties of this definition should be carefully observed,” said Prof Colin Hill (Alimentary Pharmabiotic Centre, Cork, Ireland) who presented the consensus document at the Gut Microbiota for Health World Summit in Barcelona¹. Prof. Hill gave a number of examples that do not match the criteria to be called probiotics: Dead microbes and microbial products such as metabolites and microbial components – although they might have therapeutic potential – cannot be classified as probiotics. But also live microbes merely used as processing aids in the production of fermented foods do not count as probiotics, which are ingested primarily for their health benefit. Faecal microbiota transplants should also not be classified as probiotics as they are uncharacterized mixtures of strains. “The panel recommends that the term probiotic be used only on products that deliver live microorganisms with a suitable viable count of well-defined strains with a reasonable expectation of fostering the wellbeing of the host. For some well-studied species, supporting a healthy digestive tract as reflected in a wide diversity of GI endpoints can be regarded as a core benefit. Other beneficial outcomes such as supporting the immune system, the health of the reproductive tract, oral cavity, lungs, skin and gut–brain axis are promising, but evidence is not developed to the point where such benefits can be generalized to any taxonomic group and must be considered strain-specific benefits,” said Prof. Hill.

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Translating probiotics research into clinical practice

How can clinicians with gastrointestinal patients benefit from novel findings in the field of probiotics research? A recently published reference guide, which was supported and facilitated by the European Society for Primary Care Gastroenterology (ESPCG), helps to answer this question by providing primary care physicians who wish to recommend specific probiotics to their patients with the required information. The guide which was written by an international Consensus group of experts comprises evidence-based information from 37 randomised, placebo-controlled, high-quality studies on the effects of specific probiotics on lower gastrointestinal (GI) diseases in adults, mostly irritable bowel syndrome (IBS) and antibiotic-associated diarrhoea (AAD). Results of studies that had met the strict criteria of the

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expert panel were translated into a reference tool. It lists 32 different available specific probiotics, together with the formulations and the doses in relation to the conditions they have been applied to and the treatment outcomes established by the included studies.

Among others, the reference guide gathers high evidence on the beneficial outcome of probiotic treatment in two main areas: the prevention of antibiotic-associated diarrhoea (AAD) and the reduction of overall symptom burden as well as abdominal pain and bloating in IBS patients. There is also moderate evidence that specific probiotics improve bowel movements in IBS patients, and raise the general quality of life in GI patients. Another important outcome is the conclusion that probiotics are safe and do not cause adverse effects. In sum, the studies the reference guide is based on make it plain that certain specific probiotics can alleviate a number of lower GI symptoms in adults. But this requires that the probiotic is carefully chosen and taken in adequate doses on a regular basis for at least one month, unless it cannot be tolerated for any reason.

References:

1. Hill, C. et al. Nat. Rev. Gastroenterol. Hepatol. advance online publication 10 June 2014;
[doi:10.1038/nrgastro.2014.66](https://doi.org/10.1038/nrgastro.2014.66)

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