

March 5-6th, 2016, Miami
Fact sheet #4

Gut's helpers: What can be expected of probiotics?

Probiotics have become a blooming area of research, raising hopes for a treatment that is efficient, easily applicable and safe. Prof. Philippe Marteau (Paris 7 University, Paris / France) who chaired a session on gut microbiota interventions at the "Gut Microbiota For Health World Summit" 2016 presented an outline of the current situation.

Until the 1990s probiotics used to be a fairly marginal research field within the scientific community. But over the past two decades, in the wake of the expanding area of gut microbiota research the situation has radically changed. Meanwhile, a large number of trials have demonstrated the principal capacity of probiotics to help reverting dysbiosis and contribute to the maintenance and restoration of digestive and immune health. As Prof. Marteau pointed out, probiotics can produce molecules that interact with the host via various mechanisms and pathways. Some probiotics stave off pathogens that try to invade the host. This fits with their ability to fortify the gut barrier in order to keep harmful micro-organisms residing in the gut lumen away from the blood stream. Further important modes of interactions include the strengthening of the bodily defenses by stimulating immune mechanisms inside and outside the gut, as well as communication with nerve cells of the gut that regulate – among other things – the gut motility. Studies suggest that certain probiotics have anti-inflammatory effects while others can regulate bowel transit or mitigate symptoms such as bloating, flatulence or abdominal pain. Functional bowel disorders, certain forms of diarrhea and – to some extent – inflammatory bowel diseases (IBD) have been the main areas, where probiotics have proven to be beneficial, although to varying degrees. One big advantage of probiotics is their commonly acknowledged safety, although, as Prof. Marteau pointed out, some studies suggest that side effects cannot be completely excluded.



Philippe Marteau, France

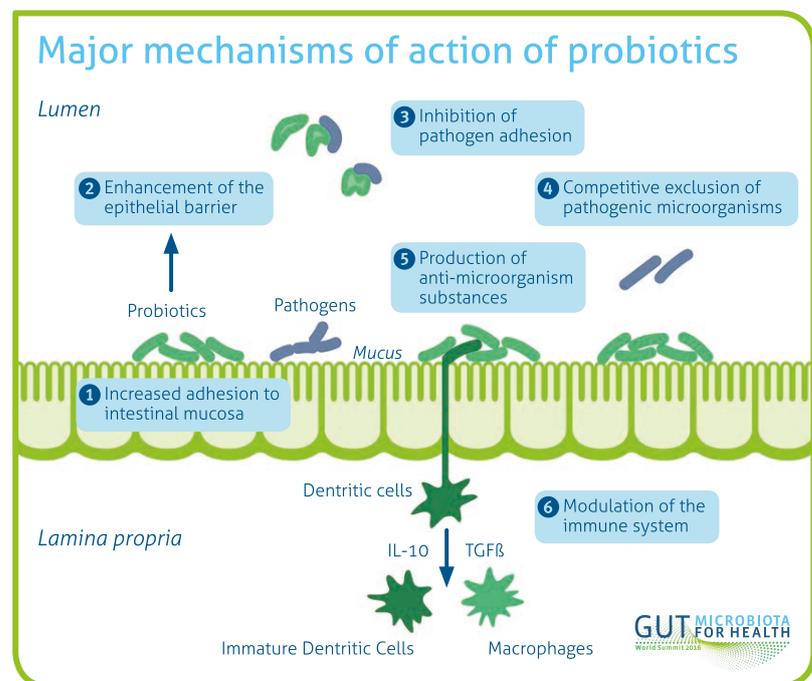
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Supporting the microbial ecosystem

Probiotic interventions should be studied and assessed against the background of the increasing knowledge about the intricate relationships constituted by the intestinal community, which can be regarded, according to Prof Marteau, as an ecosystem, consisting of microbial “landscapes”, nodes of interaction and specific core microbes. Successful application of probiotics increases the biodiversity and genetic richness of this ecosystem, thus restoring or maintaining its balance, and enhancing its stability,

resistance and resilience, that is the microbiota’s capability to quickly return to its earlier, healthy state after having been challenged by harmful events such as diseases or antibiotic cures. However, as Prof. Marteau explained, for probiotics to unfold their entire range of capabilities a whole lot of issues need to be clarified. So far, many studies have not been very convincing as they are only based on a small number of participants. This

often leads to considerable uncertainties in results unless the effect of the probiotic intervention is very pronounced. “A statistically sound base and a clearly defined methodology are key for gaining reliable results,” said Prof Marteau. Controversial issues also include the recommendable dosing of probiotics. “It is safe to say, that the effective dose is not the same for all probiotics as is also the case for antibiotics and other drugs,” said Prof. Marteau. Hence, the popular rule according to which “much helps much” should certainly not be followed.



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“Probiotics can produce molecules that interact with the host via various mechanisms and pathways thus staving off pathogens”

*Philippe Marteau,
France*

Species or strain?

With regard to the question whether probiotic effects have to be attributed to specific bacterial species or rather – on a lower taxonomic level – to strains, he opted for the latter: “It is true that there is no proof from clinical trials in humans that effects are strain- and not species-specific. But this is not surprising as this matter has not been investigated in the course of these trials. However, laboratory experiments with cultivated cells have provided evidence for some strain specificity.”

Existing metaanalyses of data obtained with different strains are not very helpful, because, as Prof. Marteau criticized, their underlying hypothesis of a single active ingredient, which can be attributed to all the strains involved is not sound. This does not concern meta-analyses of data obtained with a single strain, which, according to Prof. Marteau, provide substantial evidence for a certain degree of single strain efficacy: “One lesson to be learned from all this could be, that the widely held belief, that ‘only mixtures can be effective’ roots in misleading advertisement rather than in scientific research.” Prof Marteau concluded by pointing again to the great opportunity, offered by probiotics, to make major therapeutic progress. “However, we have to keep in mind, that the development of a probiotic is not easier than that of any other drug. It is a long process that carries the risk of failure together with the prospect of great benefits for the patients.”

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