

THE MICROBIOME, MICROBIOTA, PREBIOTICS AND PROBIOTICS

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This article deals with microbiome, microbiota, prebiotics and probiotics. At first, two of the topics will be introduced: Microbiota and the microbiome.

Microbiota, or microbes are the combination of bacteria, viruses, fungi, and other single-celled organisms that live on top of or inside the human body. Humans need the microbiota. They play a very important role in human health. For example, microbiota is involved in the digestion of certain foods that cannot be digested by the stomach and small intestine. Also, these microbiota play a key role in maintaining energy homeostasis (the balance on energy inflow and energy outflow).

The human genome is well known. It is the entire set of chromosomes of the human organism.

The microbiome is the name given to all of the genes inside these microbial cells. So, the microbiome is the genome of all the bacteria, viruses and fungi on top and inside the human body. This genome is very important for humans because we live in symbiosis with our microbes. They play a vital role in the health of all living systems.

Gut microbiota is the name given to the microbe population living in our intestine. The gut microbiota play an important role in all kinds of processes in our body. The gut microbes can even influence our brain by making chemicals that affect its processes. They produce lots of short-chain fatty acids (SCFA). They affect the brain by reducing appetite. Microbes that produce this are also important for forming the barrier between blood from the brain and the fluid in the central nervous system.

When there is an imbalance of the normal microbiome content, it could disrupt the symbiotic relationship between the host (the human being) and associated microbes. This is called dysbiosis. Dysbiosis typically occurs when the bacteria in your stomach and intestines become unbalanced. When these bacteria become unbalanced, like the bad ones overpowering or outnumbering the good ones, it can lead to illness. Over recent years the gut microbiome in particular has been linked to all kinds of diseases such as diabetes, autism, anxiety, obesity and even cancer.

Now, the two other topics that this article is about will be introduced: Prebiotics and probiotics.



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A lot of people don't know the difference between the words prebiotic and probiotic.

Etymologically, "pro bios" means "for life". In biology and medicine, probiotics are defined as microorganisms (usually bacteria) that are similar to beneficial microorganisms found in the human gut that are taken as dietary supplements or found in foods. Probiotic bacteria make the intestine the strongest defence system in our body.

For their work, they use water-soluble prebiotic fibres as energy sources.

The best-known examples are lactobacilli and bifidobacterial.

Some studies suggest that probiotics may also be good for your mental health. This may be possible as there is a connection between brain health and gut health.

There are a couple of reasons why probiotics are of importance to the human body.

Probiotics cleanse the intestines and protect the sensitive intestinal mucous membranes. They also produce vitamins, enzymes, amino acids, essential fatty acids. Another important ability of probiotics is that they can defend the body against pathogenic germs and stabilise the immune system.

Many more positive effects for the human Health include that they may decrease the need for antibiotics, the chance to get gestational diabetes, yeast infections as well as eczema.

Foods which contain probiotics are Yogurt, Kefir and fermented foods such as Sauerkraut and buttermilk.



Lactobacillus fermentum ME-3 (probiotic bacteria)

Scientists know little about potential risks of probiotics and further studies have to be conducted in order to be able to confirm the evidences.

Prebiotics on the other hand are a non-digestible food substance with the addition of fermentable molecules capable of promoting the growth and activity of bacterial groups already present in the intestinal flora or taken at the same time.

They can be found in plants, vegetables and in plant fibres.

Prebiotics are known to many as fibres. They are the main food on which probiotics feed, stimulating growth and activity. Being undigestible substances, they reach the large intestine intact. Specifically, selected prebiotics are suitable for stimulating



digestion even for the sensitive digestive system, while coarse fibres such as whole-grain products can often cause unpleasant disorders (flatulence).

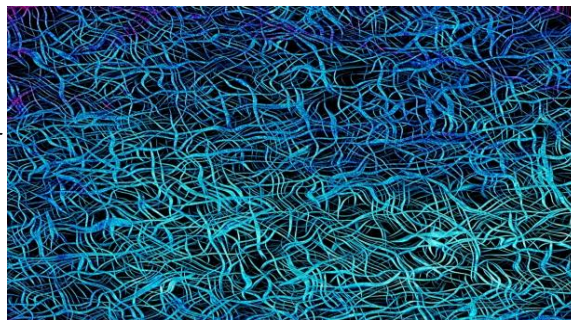
Examples of different prebiotics might be Oligofructose, Beta-glucens, Pectin and Inulin.

By including a variety of foods in their diet, people can ensure that they consume a range of prebiotics that may fuel various strains of bacteria

Prebiotics are found in many high-fibre foods, including some fruits, vegetables and whole grains.

So why are they important?

The main benefits of prebiotics are that they may support a healthy gut and a better digestive health. They also prevent antibiotic-related health problems and improve calcium absorption. One of the benefits that can even lead to weight loss is that it can change the metabolism rate.



Prebiotics are found in many high-fibre foods

There is even less research on prebiotics than on probiotics. That is why scientists are still not sure about the actual health benefits and potential risks. They are also not sure whether prebiotics are actually strengthening the potential benefits of probiotics.

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