Probiotics Master Guide

All in One

What Probiotics Should I Be Taking?

Microbiome Plus+ offers an advanced probiotic and prebiotic that have been proven to be effective in a number of clinical trials.

Here are some of the benefits:

* Improves Digestive Health

*Boosts Immune

* Helps Maintain a Healthy Microbiome

* Increase Vitamin D

* Lowers Cholesterol

* Improves Mood and Energy Levels

* Helps with Weight Loss

* Improves Overall Health

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Introduction

Congratulations on taking the first step toward a healthier you by downloading this book. This book encompasses an evidence-based approach pertaining to the restoration and healing of your gut.

Our body harbors over 10-100 trillion microbial species with a predominance of these bacteria in the gut. These microbes or microbiotas, along with their enclosed genetic material, constitute a highly organized Microbiome. Our delicate Microbiome is prone to damage by everyday factors, most importantly, by our current standard Western dietary pattern. Through this book, you'll get an insight into the rationale behind keeping your gut and the Microbiome healthy. We have shed light on the benefits of consuming live beneficial bacteria or probiotics, which when administered in adequate amounts confer a health benefit on the host. In particular, you'll learn about how a probiotic named *Lactobacillus reuteri NCIMB 30242* benefits our body beyond the domains of the gut, such as optimizing our cardiovascular health by lowering bad cholesterol levels.

Moving forward, this book will walk you through the common ailments faced by a malfunctioning gut, for instance, a leaky gut barrier and development of IBS as well as one of the most effective solutions to revamp the integrity of the gut barrier — i.e. probiotics. Since "all disease begins in the gut," we encourage you to keep other bodily systems and your health stable by maintaining the balance of your gut.

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About The Author

Muthupandi is a Microbiologist and healthcare administrator professional with expertise in Nutrition and healthcare management
he profound clinical experience and proficiency have
enabled her to achieve credibility in writing for various medical companies across the globe. She is the author of more than 50 articles. He is based in India in the South nation where he is continuing with his writing career.

From the Author

My extensive area of expertise in the field of gastroenterology, in essence, motivated me to serve as one of the authors for microbiome plus. I assure you that the evidence-based facts contained in this book are free of the market hype. Writing this book also helped me understand the product and the Microbiome on a deeper level.

The Microbiome and Bile Metabolism

The Microbiome

Your microbiome performs essential functions for your body, it is important that it is healthy and balanced[1-3].

- Recent evidence shows that your early childhood[4, 5], modern medicine[6], and diet[7] could have contributed negatively to the function of the microbiome and thus your health
- Bile metabolism is an important function of the microbiome and poor bile metabolism can lead to disease[8-15]
- Regaining microbiome and bile metabolism health requires serious lifestyle changes and or specifically formulated dietary supplements

The microbiome is the community of natural and essential organisms that live in your gut and perform functions necessary for your health like helping to digest your food[2], ensuring appropriate immune function[3], and maintaining your metabolic health[16, 17].

The bacteria that live in your gut are essential and good for your health.

The microbiome is assembled and shaped between the ages of 0-4 years old and it has been shown recently to be negatively affected by C-section delivery[4], insufficient breastfeeding[18], antibiotic use[6], an overly hygienic environment[19], and poor diet[7].

The health of your microbiome is largely a result of your childhood and diet but is also the result of environmental factors such as the use of oral antibiotic and the presence of disease[6, 20, 21].

The Microbiome of people with cardiovascular disease[22], irritable bowel syndrome (IBS)[10], irritable bowel disease (IBD)[13], low vitamin D[23] and osteoporosis[24], and other diseases such as obesity[25], liver disease[26], and type two diabetes mellitus (T2DM)[27] are notably different from those who are considered to be healthy.

The differences between a normal and unhealthy microbiome can be the result of disease or can be the cause of disease, both having a negative impact on your health.

To help restore your microbiome you must significantly and permanently change your diet by supplementing your diet with the specific bacteria required.

One important function of your microbiome is maintenance of a healthy bile metabolism.[28-30] Bile is involved in digestion of food, absorption of fat, absorption of cholesterol, removal of cholesterol from the body, production of hormones, absorption of vitamins, production of vitamins, and act on receptors found to be essential in weight management and glucose metabolism.

Healthy bile metabolism in the gut is important for the regulation of cholesterol balance[28, 30], inflammation leading to IBD[13, 14], in irritable bowel syndrome (IBS)[10], severe types of diarrhea[31], and maintaining healthy levels of vitamin D and calcium in blood[23, 32].

Bile metabolism can be disrupted by a poorly formed or damaged microbiome (bacteria in your gut)[10, 13, 14, 28, 33]. Permanent and stringent changes in your

diet and daily supplementation are the only ways to repair the microbiome and restore its function.

For people who have cardiovascular disease, low vitamin D and osteoporosis, and IBD, IBS, and some severe types of diarrhea there is evidence that your microbiome and bile metabolism could be causing and or could be affected by your disease and that daily supplementation of your microbiome with *L. reuteri* NCIMB 30242 bacteria can help to boost and restore the normal balance of the microbiome and bile metabolism.

What is the Microbiome?

The human microbiome is the population of more than 100 trillion microorganisms that live in our gut, mouth, skin and elsewhere in our bodies[34]. These microbial communities have numerous beneficial functions relevant to supporting life. They are needed to digest food, to prevent disease-causing bacteria from invading the body, to develop and maintain the immune system, and to synthesize essential nutrients and vitamins.

The total number of genes associated with the human microbiome exceeds the total number of human genes by a factor of 100-to-one. With the advancement of genomic technologies, the capacity of this "second genome" to influence health can now be harnessed as a function of the whole community.

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The Evolution of Microbiome

The Evolution of the Microbiome

Planet Earth is unique in many ways, and gathering the conditions to host life makes it even more special as compared to other planets, not only in our solar system but also in other planetary systems from the Milky Way and other galaxies. According to NASA's definition, there are three conditions for planetary habitability: the existence of complex organic compounds, liquid

water, and a source of energy to sustain metabolism. Planets with the capabilities of harboring life thus need to be at a certain distance from the star they orbit around so that the surface is neither too cold nor too hot to prevent water from constantly freezing or evaporating. The size of the planet is also important since that will determine the gravity to hold a viable atmosphere and will influence on the rotational speed to allow for alternation between day and night and therefore relatively well-distributed energy (in the form of light and heat) along its surface. While, complex organic compounds may have come to the Earth from extraterrestrial sources, as suggested from observations on comets and asteroids, theories propose that origins of life in the universe date from more than 10 billion years ago, with models advocating for a genes-first or metabolism-first categories or the more recent hybrid models. Microbial fossil remains in stromatolites provide evidence that life on Earth started 3.7 billion years ago.

With only one cell, bacteria constitute some of the simplest and some of the most ancient organisms on Earth having short reproduction cycles varying from ten minutes to up to one day. Given the relatively simple DNA replication machinery with unsophisticated quality control and short reproduction times, microbes can evolve and adapt easily to environments with diverse nutrient sources, temperatures, acidity, or humidity. Throughout Earth's history, life progressed from unicellular microorganisms to more complex multicellular species that integrate the kingdoms of fungi, plants, and animals, which provided newer and more diversified habitats for microbes to live and prosper. Besides soil, terrestrial and aquatic plants and animals host between thousands and millions (and even billions) of microbial species, depending on the environment. Specifically, the digestive systems of animals including worms, flies, birds, reptiles, and mammals (of course humans too) provide housing and food for the microorganisms that live therein. These microbes constitute a dynamic ecological system, each of them owning hundreds of genes that form part of a microbiome. For example, the human gut microbiome includes approximately 3 million genes, which is approximately 100 times the number of genes present in human cells. The constantly changing resources of the host (the food we eat) shape the size and composition of these guest communities. These guests are not necessarily enemies of the host, but are helpful and almost essential to the host's health. As shown in worms, flies and humans, the microbiome is involved in the host's growth, metabolism, immunity, and mood.

Microbial ancient DNA has been found in permafrost samples collected from several-hundred-thousand-year-old ice found at the bottom 20-meter layer of a 308-meter-deep glacier in Tibet, and in amber samples dating several hundred thousand years. The gut microbiome of ancient humans and animals was investigated in DNA samples extracted from coprolites (fossils of animal excrements) or palaeofaeces (feces from ancient species that were preserved by the specific environmental conditions where they remained). In particular, ancient microbial DNA was recovered from different archeological sources including the Rio Zape burial site in Mexico with samples dating 1400 years before present and the gut of "Ötzi the Iceman", the 5000-year-old mummy (the oldest human mummy ever found) discovered in the Tyrolean Alps in 1991. The microbiome recovered from Rio Zape coprolites resembled in great part that of African rural populations with a smaller resemblance to the primate non-human. Ötzi's microbiome was similar to that of the primate gut. These results contrast the lifestyles and dietary habits of ancient and present day societies. Nowadays we live in a more cosmopolitan world with access to processed foods and antibiotics, which accounts for major differences in the microbiome as compared to rural and ancient communities. Whereas the use of antibiotics protects humans from diseases that were untreatable in the past, these remedies are not pathogen-specific and their use results in the loss of bacterial species that may have beneficial effects on the host. Evidence of the diet effect is suggested by the presence of the species Treponema in the 1400-year-old Rio Zape samples as well as in present-day rural African samples, as opposed to cosmopolitan microbiomes. Treponema species (cousins with the syphilis-causing microbe) are believed to help the in the digestion of fibrous foods and therefore a shift towards processed diets results in a less appealing environment for such microbes in the modern society's gut. On the contrary, the loss of microbial diversity due to consumption of processed food or the exposure of antibiotics may result in the increase of autoimmune disorders, such as inflammatory bowel disease or rheumatoid arthritis, as seen in recent studies.

Thus, it appears that the gut microbiome evolved with technological advances and changes in lifestyles which brought significant benefits to our health, but scientists are starting to realize that the maintenance of a diverse gut's microbial ecology is important as well. The consumption of natural diets in combination with prebiotics and probiotics may help maintain a healthy microbiome.