**Probiotics and Prebiotics: Where Are We Going?**

Gerald W. Tannock, editor
ISBN: 0-9542464-1-1
Pages: 336
Price: $180

“Probiotics and prebiotics have become part of the lexicon of food technologists,” writes Gerald W. Tannock, editor of the provocative new book, Probiotics and Prebiotics: Where Are We Going? Probiotics were defined by Fuller in 1989, as “live microbial feed supplements that beneficially affect the host animal by improving its intestinal microbial balance.” The concept of probiotics is not new, however. Approximately 100 years ago, Elie Metchnikoff, the father of immunology, investigated intestinal microbes as causative agents in aging, a process he called “autointoxication.” He believed that lactic acid–producing bacteria (such as those found in yogurt) would suppress the growth of more proteolytic, autointoxicating bacteria.

Prebiotics have been defined as “nondigestible food ingredients (usually carbohydrates) that beneficially affect the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon.” Potential prebiotics have included bifidobacteria, indigenous microbes epidemiologically associated with long life and other healthful conditions.

The concept of probiotics has been developing over recent decades, and the use of prebiotics extends this idea. Although the ideas are intriguing, the central theories to be tested and the tools necessary to test them have been lacking. This book contributes substantially to addressing these difficul-

ties. The opening chapter, by Tannock, is rich in ideas and sets the appropriate tone for the rest of the book. The other nine chapters, by 20 other authors from seven countries, address both hypotheses and specifics in state-of-the-art reviews.

The central issue in this field is the following: how can the metabolic activities of the bacterial population in the colon be manipulated to promote health? Rigorous scientific exploration of this question has been limited by two factors: the colonic biota (flora) is vast and also largely undefined. In consequence, many studies, fueled by commercial self-interest, have lacked the stringency necessary for true scientific advancement. Accordingly, a substantial portion of this book discusses the methods, current or being developed, that will help address these deficiencies. Improved methods hold the promise of better defining which bacteria are present, distinguishing how much the biota varies from person to person, and measuring how well persons respond to probiotics and prebiotics.

Another important issue is exploring the relationship of the microbial biota and the host, especially the healthy host; such microecologic studies are critical to understanding potential microbial contributions to disease. Again, development of standard methods would permit these assessments; without extensive cataloging, we cannot establish the baseline.

A third and related issue is defining conditions that might be ameliorated by probiotic or prebiotic therapies. The authors provide a long list of such diseases, including colon cancer, inflammatory bowel disease, and some less obvious candidates such as osteoporosis and atopic diseases (for example, asthma). Some researchers have hypothesized that these latter diseases result from a childhood deprived of specific pathogens, the “hygiene hypothesis.” Use of probiotics and prebiotics has been advanced as one solution to that problem.

In summary, Probiotics and Prebiotics is an important book, from which I have learned much. One deficiency, however, is the book’s remarkable absence of discussion about the role of these agents in the selection of particular bacterial populations. The focus of the book, and of the field, is largely on metabolism, but any of the anticipated therapies, especially prebiotics, will select for particular bacterial species or phenotypes. A greater focus on the biology of selection in this milieu would have been helpful. Nevertheless, this limitation does not substantially reduce the great utility of this volume to those interested in ecology, microbiology, medicine, or nutrition. This book explores a field that is out of the mainstream of human biology and medicine but deserves to be more central. For a field often marked by hyperbole because of commercially based conflicts of interest, this book is appropriately subdued and scientifically balanced. The editor and authors should be credited for their scholarly approach.

Martin J. Blaser*

*New York University School of Medicine, New York, New York, USA

---

**Instructions for Infectious Disease Authors**

**Book Reviews**

Short reviews (250–500 words) of recently published books on emerging disease issues are welcome. The name of the book, publisher, and number of pages should be included.
That’s where prebiotics and probiotics come in. What are prebiotics? Prebiotics are substances found mostly in plant-based foods which provide sustenance for the beneficial bacteria in your gut. Prebiotics and probiotics go together well because probiotic and beneficial bacteria cannot thrive without prebiotics because prebiotics are an important source of sustenance. As a result, the reduced abundance of health-promoting bacteria could cause imbalances in your gut ecosystem that is felt throughout the body.

**TIP:** You can buy prebiotic and probiotics supplements, but it’s best to try and incorporate prebiotic and probiotic foods into your diet. Prebiotics and probiotics are both pretty big topics in nutrition these days. Yet even though they sound similar, the two play different roles for your health. Probiotics are beneficial bacteria, while prebiotics are food for these bacteria. This article explains what you need to know about the two.

**Prebiotics:** These substances come from types of carbs (mostly fiber) that humans can’t digest. The beneficial bacteria in your gut eat this fiber. If you are going to eat fermented foods for their probiotic benefits, make sure they are not pasteurized, as this process kills the bacteria. Some of those foods can also be considered synbiotic, because they contain both beneficial bacteria and a prebiotic source of fiber for the bacteria to feed on. One example of a synbiotic food is sauerkraut.
Probiotics and prebiotics have become part of the lexicon of food technologists, writes Gerald W. Tannock, editor of the provocative new book, Probiotics and Prebiotics: Where Are We Going? Probiotics were defined by Fuller in 1989, as live microbial feed supplements that beneficially affect the host animal by improving its intestinal microbial balance. The concept of probiotics is not new, however. Approximately 100 years ago, Elie Metchnikoff, the father of immunology, investigated intestinal microbes as causative agents in aging, a process he called autointoxication. EID. Blaser MJ. Probiotics and Prebiotics: Where Are We Going?. Emerg Infect Dis. 2003;9(5):610. https://dx.doi.org/10.3201/eid0905.030134. AMA. Blaser MJ. Together, prebiotics and probiotics can help to reduce your risk of cardiovascular disease and improve cholesterol levels. Your digestion will be enhanced due to the efficiency of bacteria in breaking down food you eat, which in turn can reduce symptoms such as bloating and gas. You also be obtaining more nutrients from your diet, which can go a long way in supporting energy levels and vitality. The health of your gut is closely linked to many other bodily functions. Not all companies are going to provide you with a nice allowance to buy expensive home office equipment. 100% remote companies such as Doist (the creators of Todoist and Twist) provide a $2,000 allowance to all their staff every two years to buy office equipment. Others are not so generous. Probiotics, as you may already know, are the living bacteria that colonize our intestinal tracts and perform a number of important functions related to digestion and immune protection. They’re a natural feature of the gut and body, and prebiotics are their food source. Probiotics consume and ferment this food source in order to increase mineral absorption, promote the production of short-chain fatty acids, protect the intestinal lining, balance hormones, and facilitate the proper elimination of waste. Unlike probiotics, which are extremely sensitive to heat and stomach acid, prebiotics are vir