

Probiotics and Gut Microbiota *The Underlying Helpers of Health*

Andrew Binger*

Group of Microbiology, Division of Biology and Chemistry (DBC), The BASE, Chapel Hill, NC 27510, USA

*: All correspondence should be sent to: Dr. Andrew Binger.

Author's Contact: Andrew Binger, PhD, E-mail: andrew.binger@basehq.org

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As per the amount of time that bacteria spend living and growing in the intestine, we can divide them into two categories: long-term (also called permanent residents) and transitory (also called alien). According to the findings of previous research, a dysbiosis of the microbiota in the gut may be linked to a wide variety of human illnesses. Microorganisms that are considered to be living, such as bacteria, are known as probiotics. When given to a host in adequate quantities, probiotics can be beneficial. There is compelling evidence that probiotics have a positive impact on health, but this area of research has to be expanded.

Keywords: Probiotics; Prebiotics; Gut Microbiota; Health; Diseases

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A vast number of microorganisms, including bacteria, viruses, molds, protozoa, and parasites, inhabit the human digestive tract. As far as bacteria are concerned, their number exceeds 100 trillion, there are thousands of species, and their mass exceeds 1 kg (1). The metabolic byproducts of bacteria also supply 10% of the thermal energy for the human body. More than 70% of the immune cells in the human body are found in the intestine. The intestine is the largest immunological organ in the human body, and intestinal bacteria can be considered an organ of the entire human body and one of the ten vital organs (2). Probiotics and symbiotic bacteria account for 10%-20% of human gut microbiota. Bad bacteria (harmful bacteria, pathogenic bacteria) made up 20% of the total. And 60%-70% of the bacteria were neutral (opportunistic bacteria, opportunistic pathogens). The bacteria in the middle are often either good or harmful, but they will wait for the chance to improve or deteriorate, depending on which one has the upper hand, before moving closer. Intestinal bacteria are classified as either long-term (permanent residents) or transient (foreign) based on the length of time they dwell and

grow in the intestine. The symbiotic bacteria in the stomach can coexist with the host human body in a way that is mutually advantageous, generating the so-called "human super organism." The fermentation of helpful bacteria is advantageous for the human body. The corruption of harmful microorganisms causes sickness in humans. When healthy, commensal bacteria are resistant to the immune system. When ill, harmful microorganisms mount an immunological response. The large intestine has the most intestinal bacteria, followed by the small intestine, while the stomach contains the fewest. This gut colony-forming bacteria-gut-brain axis (microbiota-gut-brain axis) regulates nerve transmission, endocrine, digestion, metabolism, and immunity, and is therefore strongly associated with numerous body functions and disorders (3).

Probiotics are described as microorganisms (living bacteria) that are advantageous to the host when administered in sufficient proportions (4). The vast majority of probiotics are lactic acid bacteria, which can decompose carbohydrates and metabolize them to produce lactic acid, acetic acid, propionic acid,

butyric acid, and short-chain fatty acids. These acids can acidify the intestinal environment, inhibit the proliferation of harmful bacteria, regulate the balance of flora, and enhance digestion. Increase the synthesis of vitamins, enzymes, and interferon; increase bowel motility; enhance immunity; prevent allergies and infections; enhance the prevention of allergies and infections. Lactobacilli, bifidobacteria, yeast, and various cocci and bacilli are prevalent. Prebiotics are substances that promote the growth of beneficial bacteria (bacteria) in the colon via dietary supplements, such as oligosaccharides (oligosaccharides), dietary fibers (water-soluble, water-insoluble), and certain Chinese herbal remedies (5). Synbiotics are preparations containing both probiotics and prebiotics. Prebiotics (Biogenics), also known as lactic acid bacteria-producing substance extracts, are produced by culturing a variety of symbiotic lactic acid bacteria (ALBEX). Probiotics are substances that contain probiotics, prebiotics, or both.

According to prior studies, dysbiosis of gut microbiota may be associated with a variety of human disorders (6). (i) Digestive tract: antibiotic-associated diarrhea (pseudomembranous colitis), traveler's diarrhea, inflammatory bowel disease (ulcerative colitis, Crohn's disease), irritable bowel syndrome, colorectal polyps, diverticulosis, hemorrhoids, colorectal cancer, leaky gut syndrome, lactose intolerance, celiac disease, pylori infection. (ii) Nonalcoholic hepatitis, alcoholic hepatitis, cirrhosis, hepatic encephalopathy, gallstones. (iii) Obesity, diabetes, metabolic syndrome, excessive cholesterol, and aging are all metabolic conditions. (iv) Autoimmunity, food, pollen, rheuma-

toid arthritis, and asthma are examples of allergy immunity. (v) Cardiovascular conditions include hypertension, coronary heart disease, and atherosclerosis. (vi) Skin conditions include atopic dermatitis, eczema, and acne. (vii) Urogenital: urogenital tract inflammation, bacterial or *Candida albicans* vaginitis, and breast cancer. (viii) Neuropsychiatry: Down syndrome, depression, anxiety, dry depression, dementia, autism, anorexia, memory loss, schizophrenia, Parkinson's disease, and multiple sclerosis.

There is a close relationship between gut microbiota and disorders of the digestive tract and beyond. Due to the fact that each human's gut microbiota is unique and diverse, it will vary with age and external and internal environmental influences, despite the similarity of each individual. In recent years, the so-called "personalized" medical paradigm has also been utilized to treat gut flora. Early treatment of recurrence of pseudo-membranous colitis or inflammatory bowel disease was improved, and then oral therapy of fecal bacteria capsules (pour pill) was introduced (7). Utilize healthy individuals' flora to alter the gut microbiota of patients, ultimately improving their condition. According to studies, using the fecal bacteria of thin mice to feed fat mice can lead to the weight loss of fat ones (8). It is known that the gut microbiota influences the eating habits of the host, which in turn affects the metabolic function, resulting in weight loss (9). Recently, psychobiotics research, development, and application have been on the rise, combining the domains of gastrointestinal tract and neuropsychological medicine (10, 11). I look forward to demonstrating future success. ■

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