

### *The Probiotic Revolution*

**A**T THE TURN of the century Dr. Elias Metchnikoff wrote a groundbreaking book entitled *Prolongation of Life*. It inspired and initiated what came to be known as the Probiotic Revolution. Metchnikoff, a Nobel laureate who discovered the cell scavengers known as phagocytes and other immune system components, documented in the book what he believed to be a direct link between human longevity and the necessity of maintaining a healthy balance of beneficial microorganisms within the body.

Today, some 90 years later, scientists and medical practitioners are proving and extending many of Metchnikoff's original findings on healing, immune-system enhancement, disease prevention, and life extension.

Not surprisingly, with only a few exceptions, little of this new research is being published by the information outlets of mainstream medicine.

We are accustomed to think that bacteria are dangerous forms of microscopic life with the potential to wipe us out. But not all bacteria are agents of darkness. Many are absolutely vital to our health. An entire bacterial universe resides in the nooks and crannies of the human gastrointestinal landscape. There are some 400 different species of these squatters comprising over two pounds of the adult's total body weight.

This vast population of microorganisms exceeds the number of tissue cells that make up the human body, which, according to Jon Minden, a biochemist at the Center for Light Microscope Imaging and Biotechnology, is about  $10^{14}$  or 10 trillion cells. If this intestinal ecosystem is functioning properly, it guards the body against parasites, harm-

ful bacteria, yeast, and viruses. We literally live or die at this subcellular level of existence and we have little or a lot of energy based on who is winning the interbacterial battle .

The harmful bacteria, whose names are associated with death and disease, multiply and spread their toxic influences whenever the body's immune system is weak, or whenever the hosts of beneficial flora is depleted. Bacterial allies fight off the pathogens and aid the body's defense system by producing natural antibiotics that are known to counteract harmful microorganisms.

The term "probiotic" (for life) was first used in scientific literature in 1965 to refer to substances secreted by one microorganism which stimulated the growth of another, in contrast to how antibiotics perform. Now, *probiotic* more generally refers to any microorganism that promotes gastrointestinal health.

There is a secret world within the human body that dramatically influences its health and longevity. As the Earth is home to an abundance of life forms that sometimes exist harmoniously and at other times struggle fitfully against each other, so the human body may be considered a micro-planet whose internal ecosystem includes trillions of living microorganisms that coexist—in concert or conflict.

The moment the human fetus begins passing through the uterus during labor, it comes in contact with, and picks up, a host of beneficial microorganisms that enter its body through the mouth as it passes through the birth canal. From there, they rapidly make their way into the intestinal tract, where they established themselves in large colonies. Moreover, mother's milk contains just the

right ingredients to nourish these friendly bacteria once they become established in the intestines. There, these "intestinal flora" produce a variety of substances that can prevent cancerous tumors, inactivate viruses, produce natural antibodies and vitamins, break down fiber and other food residues, reduce cholesterol, help to maintain the body's vital chemical and hormonal balance, maintain high energy levels and proper immune function, and counteract cancer causing compounds in the colon.

When the ecology of the human gastrointestinal tract becomes disrupted, beneficial microorganisms can no longer flourish in the needed numbers and proper balances. Then harmful toxin-producing bacteria and fungi begin to take over, further changing the ecology of the gastrointestinal tract.

We've heard the saying "Death begins in the colon." It should come as no surprise that many alternative doctors believe that a disrupted ecology of the gastrointestinal tract may be at the heart of up to ninety percent of all known human illness and disease.

Some of the more prevalent ill-health conditions associated with inadequate levels of beneficial microorganisms include chronic fatigue, rashes and other skin conditions, allergies, poor immune response to common illnesses and chronic degenerative diseases, rapid onset of osteoporosis, frequent diarrhea, constipation, and/or intestinal gas, high cholesterol levels, vitamin B deficiencies, dairy product sensitivities, chronic anemia, candida infections, intensified PMS symptoms, hormonal imbalances, chronic bad breath, chronic vaginal and bladder infections, and many other condition.

The gastrointestinal tract's balance of beneficial flora is most commonly disrupted by antibiotic usage, excessive sugar consumption, heavy alcohol intake, stress, and drinking chlorinated water and large amounts of colas and other carbonated beverages. Also deleterious to this important microbial balance are radiation therapy and the use of non-steroidal anti-inflammatory drugs (NSAIDS) like Motrin, Advil, Nuprin, Rufen, Medipren, Midol.

A diet high in red meats or rich, fatty foods will dramatically alter the acid/alkaline balance of the intestines, leading to the overgrowth of disease-causing, putrefactive bacteria that eventually

overcome the beneficial bacteria and open the door to an onset of serious health problems.

From the time of ancient civilizations, humans have consumed fermented foods such as yogurt, curds, fermented soybeans, buttermilk, and fermented cabbage or sauerkraut. The fermentation process has permitted certain bacteria from the air to grow in these foods and subsequently in the gut of those consuming them.

The most prevalent microorganisms in most yogurts—*Lactobacillus bulgaricus* or *Lactobacillus acidophilus*—are also found in the human gut, apart from other friendly microflora such as *Lactobacillus casei* and *Bifidobacteria*. But such foods, with their lower level of useful lactic acid bacteria, have not been able to entirely counteract the unhealthy body conditions produced by modern lifestyles and adverse environmental conditions. Researchers have found that altered levels of acidity and alkalinity in the gastrointestinal tract will change the ecology of the bowel environment, and thereby affect the type, quantity, and behavior of microorganisms found there.

Under ideal conditions of health and diet, the different strains of bacteria or micro-flora compete with and check the excessive number of any one strain. A healthy condition can be achieved if a balance between the "good" and "bad" bacteria in the ratio of 85 percent to 15 percent.

But this ratio will change with a poor diet, toxic environmental conditions, physiological stress, and overuse of certain drugs such as antibiotics and contraceptive pills, resulting in many forms of illness. When established, colonies of putrefactive bacteria often discharge highly toxic by-products while reacting with foods in the digestive tract. This reaction can upset the ecology of the gastrointestinal tract and slowly poison the entire body. The end result is the onset of chronic degenerative diseases.

Modern biotechnology has made it possible to deliver concentrated forms of microbial food supplements, each containing many billions of viable beneficial organisms, which may be divided into two classes—resident and transient microbes.

The two principal kinds of resident microbes are the bifidobacteria and the lactobacilli.

## BIFIDOBACILLI

Four of the most important bifidobacteria are *B. longum*, *B. bifidum*, *B. infantis*, and *B. breve*. From birth these vital bifidobacteria play a crucial role in human health. When a baby is born, the intestines are virtually sterile, free of micro organisms. Immediately, something like a Wild West land grab ensues as friendly and harmful bacteria stake their claims, vying for territory and dominance.

Between the fourth and seventh day among breast fed babies, bifidobacteria normally outdo the rest of the field. Researchers now realize that one of the chief reasons breast-fed babies get markedly fewer infections than formula-fed babies is that mother's milk tends to promote superior growth of bifidobacteria in the gastrointestinal tract, whereas store bought formulas have little such beneficial effect.

Over ninety percent of the microbial count in a breast fed infant's intestinal tract is composed of the highly beneficial bifidobacteria. These microorganisms, in turn, produce high degrees of essential by-products in the intestines, which act as a barrier to the growth of dangerous pathogenic microbes that cause infection and disease.

The levels of beneficial bifidobacteria appear to decline dramatically as the human body ages. Some researchers believe this steep decline is due chiefly to gradual disruptions and changes in the acid/alkaline balance of the bowels, which tend to favor the growth of harmful viral and fungal organisms as well as putrefactive, disease causing bacteria, and disfavor the growth of beneficial bifidobacteria.

Many researchers now believe that declining levels of bifidobacteria in the intestinal tract may actually mark the eventual onset of chronic degenerative disease. These declines brought on by aging make supplementation of these vital, beneficial micro organisms all the more desirable.

Vital bifidobacteria may help detoxify the human system and remove numerous harmful substances. They have the ability to remove cancer-forming elements or the enzymes that lead to their formation. They have also demonstrated anti-tumor properties in laboratory studies.

*Bifidobacteria longum* and *bifidum breve* are substantial producers of important B vitamins.

Many of the problems associated with aging, such as mental fatigue, depression, low energy levels, and upper respiratory problems, have been linked to decreasing levels of B-12. Some researchers suggest that supplementing the body with a healthy population of bifidobacteria may be helpful in maintaining adequate levels of these important B vitamins.

## LACTOBACILLI

Lactobacilli also have health enhancing benefits. Unfortunately, much like the beneficial bifidobacteria, these vital resident microorganisms have been noted to decline in numbers as we age.

With the decline certain diseases begin to appear. For example, lactobacilli produce vitamin K, which helps blood to clot and is essential for the building of strong bones. New research suggests that Vitamin K deficiency may be a crucial factor in predisposing the human body to the onset of osteoporosis.

Lactobacilli include the following strains:

***Lactobacillus Rhamnosus***. According to noted Canadian bacteriologist Edward Brochu, *L. rhamnosus*: increases the natural killing activity of spleen cells, which may help to prevent tumor formation; provides an increased resistance to listeria monocytogenes, the disease-causing bacteria associated with encephalitis; causes a threefold increase in the ability of phagocytes to destroy foreign invaders and other harmful matter; increases circulating antibodies by six to eight times their normal levels; and helps the body resist microbial infections by increasing levels of immunoglobulins and directly activating macrophages. They are "the workhorses of the immune system."

***Lactobacillus Salivarius***. According to Scott Gregory, O.M.D., author of *A Holistic Protocol for the Immune System*, the resident *L. salivarius* provides the human body with increased stores of energy due to its unique ability to break down foods in the intestinal tract and to make vital nutrients more readily available for use elsewhere in the body. It also helps the entire colon by eating away encrusted putrefactive materials, and it helps repair the intestinal tract by providing needed enzymes and essential nutrients, as well as by adhering to and protecting the mucosal lining.

***Lactobacillus Acidophilus***. The best known of all the lactobacilli, this popular resident of the gastrointestinal tract produces significant quantities of the enzyme lactase, which aids in the digestion of milk and other dairy products and eliminates many of the serious problems associated with lactose intolerance. According to Dr. Morton Walker, *L. acidophilus* has now been shown to produce at least four powerful antimicrobial compounds, including acidolin, acidophilin, lactocidin and bacteriocin, which inhibit the growth and toxin-producing capabilities of 23 disease-causing pathogens, including campylobacter, listeria, and staphylococci. It is used in treating chronic vaginal yeast infections, has shown both antifungal and antiviral activity, can retard flu or herpes, and is able to reduce cholesterol levels.

### TRANSIENT MICRO ORGANISMS

Transient micro organisms are also extremely important to understand. These include food borne micro organisms and even soil borne micro-organisms that make their way into the human digestive tract and, depending upon the characteristics of the specific organism involved, either subtly or dramatically influence the overall health of the human system.

Transient micro-organisms are different from resident micro-organisms in that they do not take up permanent residence in the gastrointestinal tract. Instead, they establish small colonies for brief periods of time before dying off or being flushed from the intestinal system via normal digestive processes, or by peristaltic bowel action.

Transient micro-organisms include:

***Bacillus laterosporus***. In recent clinical studies has been demonstrated to provide relief from symptoms associated with suppressed immune system function, such as chronic fatigue syndrome, Candida infections, Epstein-Barr virus, herpes, Crohn's disease, chlamydia, cytomegalovirus, parasitic infections, and many more. The effectiveness of laterosporus may be due to its strong antibiotic qualities.

***Bacillus subtilis***. One of the most important immune system stimulators of all the transient micro-organisms, *B. subtilis* is remarkable for its ability to

activate the body's immune defense and to stimulate the proliferation of crucial lymphocytes.

***Bacillus coagulans***, also known as *L. sporogenes*, modifies serum lipoproteins or blood fat levels, and, according to Dr. A. B. Gandi, provides an excellent preventative effect against various diseases of the intestine.

***Streptococcus thermophilis*** produces a number of antibiotic-like substances as part of its metabolic process and helps to suppress tumor development and growth. By producing substantial quantities of the enzyme lactase, it aids in the digestion of milk sugars and may provide an effective remedy against lactose intolerance. It has been used in hospitals as an effective remedy for chronic diarrhea in infants.

### SUPPLEMENTATION

Broad spectrum supplementation seems to be the most effect way to deliver the micro-organisms. Some products contain up to fourteen different strains of beneficial resident and transient bacteria. Other health practitioners recommend alternating three or four combinations of friendly flora in one-week cycles.

Widespread fear of bad or pathogenic bacteria as the cause of many, if not all, of our worst infectious diseases has led to overuse of antibiotics in medicine and pesticides in agriculture. The problem with this approach is that it is non-selective. It destroys all bacteria, both friendly and adverse.

This upsets the natural biological balance and actually leaves the body more susceptible to future infection. In other words, the primary cause of infection is not due to the presence of unfriendly bacteria, but to insufficient friendly bacteria. With a balance of many different types of friendly bacteria in adequate numbers, unfriendly bacteria do not have the opportunity to create illness.

In such a case, one may benefit from a probiotic supplement. For those who have been on antibiotics and want to replace the good flora during this time, they may want to supplement with much higher quantities of these probiotics. For example, there may be the need to use 20 to 40 or more billion colony-forming units (CFUs) per day when more therapeutic amounts are required. If, however,

someone has minor intestinal concerns and/or just wants to replace the flora to support good intestinal health, they may supplement with a smaller amount, 1 to 5 billion CFUs per day. Multi-spectrum and high potency formulations are marketed under such brand names as Pro-Bio Gold and Multi-Flora Spectrum and are available through UAS Laboratories, Kirkman Laboratories, and other sources.

### SOIL BASED ORGANISMS

Today, millions of people know about the proven health benefits that can be gained by supplementing and maintaining the human body's native population of beneficial intestinal microorganisms. Whether through the use of cultured soured-milk food products like yogurt, or through the use of specially developed bacilli supplements, it is now abundantly clear that maintaining the body's natural balance of intestinal microorganisms is one of the primary keys to maximizing long-term health and well-being.

What most people don't realize, however, is that there are numerous other beneficial microorganisms which have been proven to dramatically benefit the human body, even though they are not native to its normal intestinal flora.

As Dr. Peter Rothschild, one of the world's foremost experts on human immune response and its relation to beneficial microorganisms, recently emphasized: "It's a crying shame that most health-minded Americans today have been brainwashed into thinking that their beloved holy St. Acidophilus is the only micro-organism that can benefit their health. In truth, there are many bacterial microorganisms in existence which can stimulate phenomenal health and immune system benefits when ingested as dietary supplements—even though they are in no way indigenous to the human system."

In particular, Dr. Rothschild is referring to soil-based organisms, which have several advantages over the microflora endogenous to the human system: they proliferate more rapidly and more aggressively stake out a claim for "squatter's rights," digesting and dislodging accumulated putrefaction in the process. They energetically break down

hydrocarbons into their basic constituents, enhancing assimilation and increasing overall nutrition. This action helps to eliminate constipation. SBOs produce specific proteins which act as antigens (foreign substances), which, in turn, stimulate the immune system to produce "non-addressed" antibodies above its normal homeostatic level. That is, they have not been pre-programmed to attack any specific infection or pathogenic agent. They are kept in reserve and are imprinted by the immune system when a definite threat arises.

Any existing health problem is thus assisted by the elevated level of immunologic capability, while incipient problems are more forcefully kept at a standoff. SBO's vigorously attack and eliminate pathogenic molds, yeasts, fungi, and viruses, rescuing what may be an overworked immune system. SBOs work in symbiosis with somatic cells, metabolizing proteins for them and helping to rid the cellular environment of toxic wastes, thereby boosting its normal function.

Further specific actions of SBOs, which are relatively new to the health field and have received virtually no attention from mainstream medicine, include their ability to stimulate the body's production of up to 20 sub-species of alpha-interferon, a key regulator of the human immune response, and a potent antidote for chronic fatigue syndrome, viral herpes, and hepatitis-B and C, influenza, and other immunopathic conditions.

SBOs produce lactoferrin, an iron-binding protein which retrieves iron from ingested food and delivers it to where it is needed. It is especially helpful in treating anemia and difficulties in iron assimilation. SBOs also produce SOD (super oxide dismutase) as a bi-product of their metabolism. SOD is a powerful anti-oxidant, an effective scavenger of free-radicals, which cause the cellular mutations associated with the onset of cancer and inflammatory diseases.

SBOs are marketed under several different names, including EarthFlora, Royal Flora, and Nature's Biotics. The prospects for their usefulness in restoring and maintaining human health at the physiological level is most promising. □

—C.W.