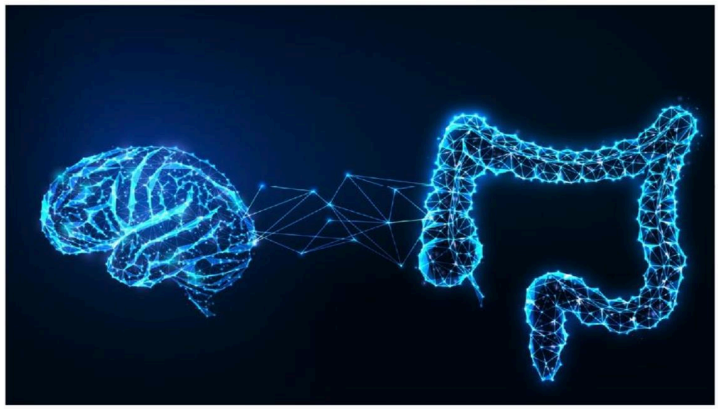
You Can Control Immuno-Neuro-Endocrine Stress

by Guy Schenker, DC



In recent decades, intestinal microbiota has become a subject of intense research showing that your microbiota has far-reaching health effects because it is intimately involved in numerous aspects of normal physiology.[1]

Consider these facts:

More than 70% of your immune system resides in the lining of your intestinal tract and is activated from there by your microbiota to perform immune functions throughout your body.[2]

Amazingly, the surface area of your gut is the size of a tennis court if it were spread out flat — nearly 3,000 square feet.

Research also shows there are direct axes (communication systems) originating from your microbiota-controlled gut lining:

- A gut-brain axis[3]
- A gut-hypothalamus axis[4]
- A gut-liver axis[5]
- A gut-adipose axis[6]
- A gut-pancreas axis[7]
- A gut-muscle axis[8]
- A gut-immune system axis[9]

Each of these is a two-way communication line to and from your microbiota-controlled gut lining. All aspects of your body's metabolism are influenced by your microbiota activating one or more of these axes.

To illustrate, your microbiota help control your metabolism through the gut-liver axis, the gut-pancreas axis, the gut-muscle axis, and the gut-adipose axis.[10] An unhealthy microbiota is a primary and major contributor to:

- Weight gain
- Hypoglycemia
- Insulin resistance leading to type 2 diabetes
- Elevated triglycerides
- Fatty liver disease

This colon-microbiota control of fat and sugar metabolism is also influenced by the gut-hypothalamus axis. The hypothalamus receives signals from the gut that influence control of the pituitary, and, hence adrenal function, thyroid function, and sex hormone function. Abdominal weight gain, in particular, indicates an excessive adrenal cortisol stress response provoked in part by an aberrant gut-hypothalamus axis.

As any of these axes go functionally awry, there is an inflammatory component to the resulting pathophysiology, and that brings us to the most fundamental communication line of all — the gut-immune axis. That critical axis is likely far greater in scope than you have ever imagined.

Truly, your gut-immune axis is the control center of the immune system by:

- Initiating the release or inhibition of pro-inflammatory cytokines.
- Initiating the release or inhibition of anti-inflammatory cytokines.
- Activating macrophages when the need is perceived.
- Being saturated with billions of mast cells, the most fundamental component of the innate immune response.[11]
- Connecting the immune system to the nervous system as mast cells cluster around sympathetic and parasympathetic nerve endings in the gut wall.[12]
- Receiving parasympathetic feedback provoked by the inflammatory cytokine interleukin-2.[13]
- Responding with an alarm reaction to the toxins produced by abnormal bacteria, fungi, yeast, or viruses in the GI tract, triggering the release of the pro-inflammatory cytokines interleukin-1 and interleukin-2.[14]

So, if the GI tract regulates the immune system, and you know the immune system is the keystone in your defense against the immune-neuro-endocrine stress that underlies all chronic disease and dysfunction, then how important is restoring ideal gut mucosa structure and function? In other words, who needs supplementation with a synbiotic (a blend of probiotics and prebiotics)? You do, as does everyone in your family and all your patients.

In fact, the human microbiome is proving to be vastly more important to your health than the human genome. The Human Microbiome Project reference database, established in 2012, reveals in unprecedented detail the previously unimaginable influence of prebiotics and probiotics on health.

Prebiotics are often neglected. Their contribution to cultivating a prolific immune-reactive microbiota is huge. Prebiotics serve two purposes. First, they increase the population of beneficial bacteria. There are a few select prebiotics that specifically "fertilize" the proliferation of the most desirable probiotics. The second purpose of prebiotics is the production, through fermentation of that prebiotic, of increased quantities of the extremely immune-reactive short-chained fatty acids, especially butyrate, a major controller of the gut-immune axis.[15]

Specific combinations of prebiotics with probiotics minimize the production of endotoxin, and that alone takes a huge stress off the immune system. Endotoxin interferes with the communication axes systemically in two ways.

First, these toxic bacterial products trigger an inflammatory cascade in the immune system of the gut lining. Dendritic cells, mast cells, and macrophages are inappropriately activat-

ed by endotoxin, thus setting off a massive pro-inflammatory chain reaction that disperses through the entire body. Pro-inflammatory cytokines are released that may result in acute symptoms of disease, but always result in low-grade chronic inflammation.

The second way endotoxin distorts the communication axes originating in the gut is by dominating the communication line between the gut and the brain, the gut and adipose, and the gut with the liver. The inappropriate responses of these target organs to endotoxin are a major factor involved in inflammation associated with metabolic diseases, obesity, type 2 diabetes, hypertension, and fatty liver.

Only a small quantity of prebiotics is required to yield major decreases in immuno-neuro-endocrine stress. The growth of specific probiotics is fertilized most effectively by konjac glucomannan and high FOS inulin. Bifidobacteria (the most quantitatively significant bacteria in your colon) are especially responsive to glucomannan and inulin.

We have just introduced the concept of specificity in prebiotic and probiotic supplementation. This concept is essential for you to understand. Immune-controlling probiotic supplementation can never be achieved with a random assortment of probiotics. There is surprising specificity in the action of particular probiotic species with some of them being anti-inflammatory, while some are beneficially pro-inflammatory in certain immune-deficient states. When properly nurtured with prebiotics, some probiotics will control excessive lymphocytic Th-1 inflammation, and some control excessive lymphocytic Th-2 immune-reactivity.[16]

However, some probiotics are actually pro-inflammatory in a damaging way. One particular bacterial species actually disrupts the gut-immune axis. The ever-popular Lactobacillus acidophilus causes bronchial distress and very commonly causes wheezing in children. It is of no anti-inflammatory benefit for asthmatics, and it can actually exacerbate asthma. Furthermore, L. acidophilus is not even a natural colonizer of the human microbiota after six months of age. Truly, you must caution your patients to never take a probiotic supplying the ubiquitous acidophilus.[17,18]

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First, consider the Bifidobacterium group, particularly the powerfully immune-modulating B. lactus, B. breve, and B. longum. These are foundational species in your microbiota and are the major colonizers. A substantial population of Bifidobacteria is a constant source of immune support and helps defend against excesses of E.coli and other endotoxin producing species. It is important to note that while Bifidobacteria are somewhat resistant to assault by antibiotic drugs, you will still lose 30% of them in a typical round of antibiotics. Restor-

ing that population is essential, and those who repeatedly take antibiotics are continually suffering some degree of aberrant immune function.

While Bifidobacteria are your resident defenders, some specific probiotics have an even greater impact on immune function. They control multiple triggers for mast cell activation or inhibition, for macrophage activation or inhibition, for butyrate production, and for every one of the gut-organ axes.

One particular species of note is Lactobacillus reuteri, which has well-documented anti-inflammatory properties. It is effective at inhibiting the inflammatory cytokines associated with the Th-1 inflammation found in autoimmune diseases such as rheumatoid arthritis, type 1 diabetes, Crohn's disease, and multiple sclerosis. This impressive anti-inflammatory probiotic also controls the Th-2 excess in atopic patients, decreases allergic airway response, and decreases both allergic and non-allergic dermatitis. Amazing stuff![19]

Yes, you have the power to control immuno-neuro-endocrine stress via specific supplementation with synbiotics. Systemic inflammation control will only be achieved when you functionally restore the 70% of your immune system residing in your gut.

Dr. Guy Schenker, a Pennsylvania chiropractor since 1978, developed the Nutri-Spec System of Clinical Nutrition, which eschews symptom- based nutrition in favor of individualized metabolic therapy. Reach us at 800-736-4320, email NutriSpec@Nutri-Spec.net, or visitnutri-spec.net.

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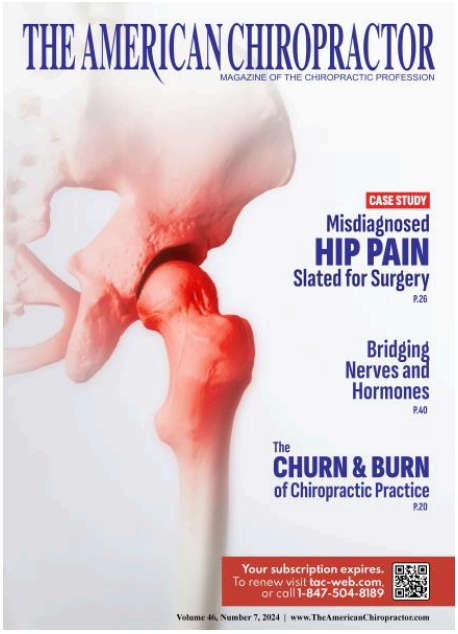

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