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with Michele Bender

Foreword by Mark Hyman, M.D.
Chapter 8

HEAL YOUR GUT

You’ve probably heard and even used the expression to “trust your gut” or said that you had a “gut feeling,” “gut instinct,” or “gut reaction” to or about a situation in your life. These expressions refer to an instinctive feeling or intuition that you have deep within your core. In the world of medicine, “gut” is a slang term that includes your whole digestive tract, including your stomach, small intestine, and large intestine. The gut is literally at the center of your body and it plays a central role in your health, just as your “gut feeling” plays a central role in your instinct. But before I go into detail about the gut and its impact on your health, let me first explain its crucial link to your immune system.

What’s Gut Got To Do With It?

Every day, you expose your body to things that may cause infections or illness such as viruses, bacteria, mold, parasites, and foreign proteins in food. These outside agents are typically brought into the body through your mouth and nose. As your first line of defense, the immune system in your gut is faced with the task of clearing out the bad agents, while keeping what your body requires to stay nourished and healthy. It also has the job of repairing any damage caused by these foreign substances and any reactions they’ve caused in your body, such as inflammation or infection.

To carry out these important tasks, the immune system is divided into two systems. Each one plays a role in protecting you from the invaders that come into your body every day. The first is called the innate immune system, which is the front line of defense. These cells are always alert and ready for action and need no priming or prep time. Antigen presenting cells are one type of cell from the front line and here’s how these cells get their name: an antigen is a substance, like a bad bacteria, yeast,
parasite, or virus, that is recognized as foreign when it meets up with these cells. To simplify, I often call the bad bacteria, yeasts, parasites, and viruses “invaders” or “foreigners.” An important type of antigen presenting cell that makes its home in your gut are the dendritic cells and they live right under the surface of your intestinal lining in large numbers. There, they lie in wait, their cell surface filled with receptors like antennae, ready to touch and then react to any foreigners that come their way. If the dendritic cells touch something they see as foreign, their job is to spread the word to the cells that make up your immune system’s second line of defense. As you can see, the two important roles of your immune system’s front line of defense are first to recognize what is foreign, and then to sound an alarm by telling other cells in the immune system to react.

The group of cells that make the second line of defense is formally known as the adaptive immune system, because they are cells that adapt to the alarm that’s been sounded. In the gut, the dendritic cells sound the alarm and activate your immune cells (more formally known as lymphocytes), which include your T cells and B cells. Both groups of immune cells live within and underneath the lining of your intestines. The dendritic cells respond immediately and then it takes a bit of time, anywhere from hours to days, for the lymphocytes to mobilize to either make more killers cells or to make antibodies to attack the foreigner.

When this process goes smoothly, there are signals and messages sent between the dendritic cells and T cells that keep the immune system in balance. T regulator cells help turn the alarm off when the immune system’s job is done. For example, let’s say that there was salmonella, a type of bacteria, in something you ate for dinner last night. If things are working correctly, your dendritic cells recognize the salmonella as foreign, and sound an alarm to the T cells and B cells, which then attack the bacteria and clear it out of your system. But if the T regulator cells are not working correctly the killer cells and/or antibody producing cells can get stuck in overdrive and become confused about what is foreign and what is not. This confusion can then cause autoimmune diseases. All of the steps in this book are aimed at balancing your killer cells and your antibody producing cells, and to do so we must focus on fixing your T regulator cell function.
So now you can see that your digestive system has a lot of influence on your immune system. [In fact, seventy-percent of your immune system actually lives in your gut.] Yes, you read that correctly! Seventy percent. It sounds surprising at first, but actually makes sense if you think about it. After all, you bring the outside world into your body through your mouth every day so your front line of defense needs to be in your gut. Because so much of your immune system is in your gut, it’s critical to keep your gastrointestinal system healthy and in balance. It is also one reason why in Functional Medicine, we look at the gut first when it comes to any chronic disease. These immune cells release many, many inflammatory molecules when they are activated, traveling around the body and causing inflammation in your joints, hands, blood vessels, brain, you name it! Since there is always inflammation at the root of all chronic disease, the gut is the place to start.

The role of intestinal bacteria

The good bacteria that live in your intestines have the most important influence on the function of the T cells that are located there. Besides immune cells, the gut is also home to an estimated 70 to 100 trillion beneficial bacteria of various species. Though the word “bacteria” typically has a negative connotation, flora are a natural part of us and are critical for so many of your body’s functions. You may recognize the names of some of these good bacteria, like lactobacillus acidophilus and bifido bacteria, because they’re some of the most popular and in recent years their presence in
certain things like yogurts and probiotic supplements has been highly marketed. Experts are conducting ongoing research to understand the differences between the various species of these beneficial bacteria and the importance of each one. But for the purposes of this book, we’ll discuss the good bacteria in general (rather than differentiating between the various kinds) and detail the health benefits they offer, especially when it comes to the development and maintenance of your immune system.

As I have mentioned, there is an epidemic of autoimmune diseases today. [It is believed that imbalances in gut flora are a big part of the problem, causing both autoimmunity and making your symptoms and antibodies worse if you already have a diagnosed autoimmune disease.(2,3,4,5] How does the gut flora get out of balance? One theory is called the hygiene hypothesis and it suggests that we have been so focused on fighting germs –with things like antibiotics and antibacterial wipes, cleansers, hand sanitizers, and more – that we’ve sterilized our environments too much.(6) Many children today live in concrete jungles instead of being surrounded by dirt, trees, and grass the way most children were generations ago. As a result, they are not exposed to the bacteria, parasites, and molds that naturally exist when children play outside all day, every day. Because of this city living and our culture’s obsession with banishing germs, our children live in worlds that are too clean and without enough germs to fight, their immune systems don’t develop properly. After all, it is exposure to germs when you are young that helps teach your immune cells what is bad and what is not. Then when you get older, your immune system remembers and recognizes the dangerous germs and reacts against them. Exposure to germs also brings in many good bacteria and the gut immune system has to learn how to live with these trillions of bacteria and not attack them. Learning the difference between good and bad bacteria is called tolerance and this tolerance is something that develops in your body when you are very young. Tolerance is very, very important because without it your immune cells get confused and begin to overreact and attack your own good flora and your tissues, which is exactly what happens in autoimmune diseases.

When you are born, your body is sterile, meaning your skin, lungs, and intestines don’t contain any bacteria at all. When you pass through your mother’s birth canal, you are exposed to bacteria in the outside world and your gut begins a harmoni-
ous and beneficial relationship with over 1000 strains of good bacteria. The point is that when you are born, you need to be exposed to the many bacteria that will later live within you. In fact, the hygiene hypothesis has recently been renamed the Old Friends Hypothesis, with the “old friends” being the good intestinal bacteria, and suggests that many people have lost these “old friends” who have always lived within us humans. Some people joke that the answer to the hygiene hypothesis is that our children need to eat dirt, but that is not the way to expose them to the old friends that are beneficial. Instead, the most widely used approach is to re-balance the gut with herbs and probiotics (also called healthy flora supplements), which we will do in the next chapter, Healing Your Gut Workbook, but first it is important to understand what’s going on in your gut and why the bacteria that live there, or should be living there, are so crucial for a strong immune system and robust health in general.

For a healthy immune system, your body is dependent on a good relationship with the beneficial bacteria that live in your digestive tract. Although there is much evidence that other things trigger autoimmune diseases, and I discuss these things like toxins, stress, infections and food elsewhere in this book, the epidemic rise in autoimmune diseases in the last few decades suggests that there is something inside our bodies that has changed. One of these recent changes is the balance of good bacteria. Whether you have had an imbalance of good bacteria since childhood, or whether it happened later in your life from things like taking too many antibiotics and antacids, drinking too much alcohol, or experiencing too much stress, we need to focus on what we can do now, today, to bring your gut back into balance. A huge part of this healing includes making sure you have enough beneficial bacteria. But first let’s talk about what these good bacteria are actually doing inside of you.

**Healthy Flora and The Immune System**

There is a lot of research looking at the bacteria that live in the gut and how they grow, develop, and help our immune systems function properly. As I mentioned before, it appears that gut flora play a huge role in early infancy in helping your im-
mune cells develop properly and in the right balance. Beneficial bacteria also seem to help the immune system learn the difference between something like your own tissue that is a natural part of you (which I also refer to as “self”) and a foreign substance (which is also called “not self”). Thus, the immune cells develop tolerance to these bacteria rather than try to kill them.

Good bacteria are key players in the relationship between your immune system cells in both the first line of defense and the second. Changes in your good bacteria can have a significant influence on your body’s T helper cells that, as we discussed in Understanding the Stress Connection, help accelerate your immune system’s response to a foreigner. I describe these T helper cells as the gas in a car because they help turn on your body’s immune response. However, these cells can get stuck in overdrive, keeping your immune response going on and on without stopping. Sometimes they get stuck making more killer cells (which is called Th1 dominance). Sometimes they get stuck making more B cells and antibodies (which is called Th2 dominance). Good bacteria help unstick the gas peddle, and help the breaks (the T regulator cells) work better. Ideally, we want the gas and brakes to be working in balance.

Beneficial bacteria also stimulate the production of a protective antibody that’s one of the main defenses in your gut. It’s called immunoglobulin A, a compound made by the immune system to fight off foreign substances. (This compound is so important that one way to tell if your gut immune system is working properly is to have the levels of this antibody measured in your blood, stool, and saliva.)

Good bacteria make something called short chain fatty acids, which feed and strengthen all the cells that line your digestive tract, keeping them healthy. They also help form the protective barrier (also called your intestinal lining) that helps keep the outside world in your intestines and not in the rest of your body when you eat. And creating this barrier is no small task considering that the surface area of your intestines, when if opened up and spread out, would be greater than that of a tennis court. These good bacteria interact with your immune cells to directly protect you from harmful infections and maintain the function of that barrier so that unwanted foreign proteins and infectious agents can’t seep into the blood stream. If this barrier is compromised, you can develop what is called leaky gut syndrome, a condition that can lead to autoimmune diseases. (But more on that later in this chapter.)
We are constantly exposed to toxins like cleaning products, pesticides, and additives in the food we eat and the air we breathe. Our good bacteria help us begin the process of metabolizing these toxins, which means changing their form to make them less harmful. They also make enzymes that improve digestion. In particular, they help the body break down gluten, a protein found in wheat, barley, spelt, and kamut. As we discussed in Chapter 2 Using Food As Medicine, gluten is a very toxic protein that often causes an allergic reaction or other immune response and is a big problem for people with autoimmune diseases. Properly digesting and breaking down this gluten protein decreases the chance that your immune system will react when you eat it. [It is entirely possible that impaired digestion and a leaky gut due to a lack of beneficial gut flora is the reason why some people develop gluten issues in the first place.]

Lastly, good bacteria also help the body process vitamins such as B12 and K so they can be better utilized and absorbed by the body. [The bottom line: Having enough friendly flora in your gut reduces the incidence of allergies and autoimmune diseases] and restoring and balancing these flora in the gut can treat and reverse these conditions as well. (Something else we’ll discuss later in this chapter.).

So what does it feel like when you don’t have enough good bacteria in your gut? You can have:

- constipation
- diarrhea
- gas
- bloating after eating
- abdominal cramping or discomfort
- upper stomach problems like reflux and indigestion.

Fixing the bacteria imbalance is critical not only to alleviate all these gut symptoms, but also for you to heal your immune system, and we will do that in the next chapter, Healing Your Gut Workbook.
Belly Out Of Balance

Before we move on to healing your gut, let’s look at all the things that can go wrong in the gut that harm your immune system. We will start at the top with your stomach.

Your Digestive Power

I like to describe the entire digestive tract as a river. The stomach is at the top of that river and has a major influence on what the balance of good bacteria, and thus your immune health, will be downstream. The contents of the stomach empty into the small intestine, which flows into the large intestine and then out of the body. As the river flows, the stomach secretes acid and the enzyme pepsin, which begins the digestion of protein. It also secretes messengers that tell the pancreas and gall bladder to release enzymes and bile to help the digestion process even further. Without adequate amounts of these acids and enzymes, food doesn’t break down properly so it sits in your stomach, refusing to leave. This poor digestion can cause reflux or heartburn.

The Importance of Acid

Speaking of heartburn, another important part of your stomach is the acid it contains. If you think back to high school chemistry, you may remember that pH is a measure of how acidic or alkaline something is. There is a pH scale that goes from 0.0 to 14.0. Anything less than 7.0 is acidic, anything more than 7.0 is alkaline, and 7.0 is neutral. Many people take antacids to reduce the acid in their stomachs, yet the pH of your stomach needs to be 1.5, an acid pH, for several important reasons. First, a pH of 1.5 kills any viruses and bacteria that you might ingest and prevents unwanted infections from coming into your body and stressing your immune system. (Think of it as your own personal food sterilizer!) An acid pH also helps the food in your stomach digest quickly and move forward, instead of refluxing backward into your throat. Good bacteria are very tolerant to acid, while unfriendly flora and yeast
are not, and so an acid pH will help the bacterial balance in your small intestine, which is downstream from your stomach, stay in favor of good bacteria.

The right pH is also necessary for the digestion and absorption of many vitamins and minerals, which is key because certain vitamin deficiencies can cause an array of health problems. For example, a B12 deficiency can harm your ability to make red blood cells, which you need to bring oxygen to tissues throughout your body. This is a condition called anemia where you tend to feel very tired as a result. Calcium and magnesium deficiencies can contribute to osteoporosis, a disease where your bones become very porous and at risk for fracturing. In fact, many studies link antacids to an increase in fractures believed to be caused by the poor absorption of minerals like calcium and magnesium in an alkaline pH. The absorption of other minerals like zinc, which is a key player in the immune system, is also affected. Low stomach acid can really impair your digestion of protein, which provides the body with amino acids that are critical for the creation of new tissue especially immune cells. To have enough amino acids for a healthy immune system, you need to be eating enough protein. But you also need to digest protein properly so it can be absorbed; stomach acid helps activate your digestive enzymes so this can happen. After leaving the stomach, the food you eat moves into the upper part of the small intestine called the duodenum. This area is where the enzymes from your pancreas and the bile from your gall bladder meet up with the food to further digest proteins, carbohydrates, and fats. These enzymes need a low pH to work well. If your stomach acid or digestive enzymes aren’t doing their best, they don’t finish their job and partially digested foods make their way further down into the intestines. These particles traveling where they don’t belong adds to the problem of leaky gut syndrome (an issue we’ll discuss shortly) and increases the risk of food sensitivities and autoimmune reactions, in fact studies have shown people who take antacids and proton pump inhibitors have an increased risk of developing food sensitivities.

[Now you can see why antacids, which many people think help their stomachs actually do the opposite and harm your immune system.(7)] So if you regularly pop them, we need to get you off of them. But don’t worry. You don’t have to choose between having heartburn and your stomach having the right pH. There are other ways to treat heartburn.
What’s commonly known as heartburn is caused by a stomach lining (which is called the mucosa) that has worn away, making it raw and sensitive to the amount of acid that should be in your stomach. As we discussed, this acidic environment is normal; it’s the worn stomach lining that is not. Many things can cause this lining to wear away, including stress, alcohol, a stomach bacteria that causes infections called H.pylori, aspirin, and medications. Once the lining is damaged, you feel the acid that is normal to have in your stomach, but which you wouldn’t feel if your lining were strong, thick and healthy. Because acid is so important, the answer is not to kill it. The answer is to heal the lining, something we will do in the next chapter, the Healing Your Gut Workbook.

Surprisingly, many people with reflux or heartburn actually have too little stomach acid, a condition called hypochlorhydria. Acid is made in special cells in your stomach called parietal cells. If your stomach lining is constantly irritated, these cells can become damaged and produce less acid. It is also possible to develop antibodies to these stomach cells, a common condition called autoimmune gastritis that affects up to 2% of the population and is even more common among those living with autoimmune diseases. For example, researchers at the University of Antwerp in Belgium, found that people with type 1 diabetes and autoimmune thyroid disease were three to five times more likely to have autoimmune gastritis than those who did not have either of these conditions. Low stomach acid is also caused by H. pylori infection, getting older (acid levels decrease as you age), and chronic stress-related gastritis. (8) But whatever the cause, low stomach acid has been associated with many autoimmune diseases including Addison’s disease, lupus, myasthenia gravis, celiac disease, dermatitis herpetiformis, Graves’ disease, pernicious anemia, rheumatoid arthritis, Sjogren’s syndrome, and vitiligo.

Let me give you an example from my practice. My patient Linda, a 40-year-old African American woman, came to see me four years after she was diagnosed with Sjogren’s syndrome. Sjogren’s is an autoimmune condition where antibodies attack and damage your salivary glands and tear ducts. Linda was a classic case of Sjogren’s syndrome with the common symptoms of dry mouth and eyes and joint pain (Most patients have some sort of inflammation, usually arthritis or muscle tenderness.) Linda had also been living with constipation and abdominal pain that she said
had been going on “forever,” probably since her mid 20’s. She also had a persistent cough and reflux that she remembers began when her mother died five years prior. A year before coming to see me, an endoscopy revealed signs of a chronically irritated stomach lining and inflammation in her stomach. Her doctor prescribed a proton pump inhibitor (PPI), which is a medication that reduces the amount of acid in the stomach and is commonly used to treat acid reflux and heartburn. But she didn’t want to stay on the medication because she was worried about developing osteoporosis and the risk of fracturing a bone because as I mentioned earlier, numerous studies link PPI’s to an increased fracture risk. She also wanted to get off the medication because her persistent, bothersome cough, which is one of the medication’s possible side effects, still lingered. As a result, she came to see me for help with her digestive issues.

One of the first things I did was to put Linda on the elimination diet that we discussed in Chapter 3 Using Food As Medicine Workbook removing gluten, dairy, soy, and corn for three weeks. Almost immediately, the joint pain she’d been living with for four years disappeared, a result that is pretty typical. (When we talk about leaky gut syndrome later in this chapter, I will explain how some of the foods you eat can cause inflammation in your joints). However, we needed to go further because a stool test showed an overgrowth of yeast and bad bacteria and lack of good bacteria in her gut. (A stool test is when a sample of your stool is sent to a laboratory for analysis.) After treating Linda’s gut with herbs like berberine and oregano and probiotics, which are live cultures that help balance the flora in your gut, her abdominal pain and constipation were gone.

However, Linda still had reflux and, although she was free of any physical symptoms of Sjogren’s syndrome (her dry eyes and mouth were gone), a blood test showed that her antibody levels for this condition were still high. So I decided to focus on her stomach and her digestive power and added two supplements to her regimen. One was a digestive enzyme and the other something called betaine, which is stomach acid in a pill form. Just two weeks after she started taking these supplements, the reflux Linda had lived with for five years was finally gone. Making her stomach more acidic so that the pH was close to 1.5, activated the digestive enzymes. Linda was finally able to properly digest the foods she ate. The fact that these en-
zymes and extra stomach acid worked showed me that Linda’s reflux was caused by poor digestion, a poor production of stomach acid, and a chronically irritated stomach lining due to stress. Just to note, there are foods you can eat instead of taking supplements to boost your enzymes and stomach acid, like apple cider vinegar and ume boshi plums, and you will learn more about these foods in the Healing Your Gut Workbook.

Six months after her first appointment, Linda repeated her initial lab tests and her results had reversed, meaning there was no sign of Sjogren’s syndrome and her antibody levels were now normal. For her, all the answers to changing her health (and thus, her life) sat right in her gut! The same could be true for you, as it often is for those with autoimmune conditions, which is why this part of The Immune System Recovery Plan is so important.

Dysbiosis: An Imbalance In Your Gut’s Good Bacteria

When the amount of healthy bacteria in your gut is too low, a condition called dysbiosis occurs. Sometimes you might also have an overgrowth of harmful bacteria, yeast, or parasites and this makes the dysbiosis more severe. The severity of dysbiosis can cause a lot of intestinal symptoms, and as I mentioned before, many people are given a diagnosis of irritable bowel syndrome because they have chronic constipation and/or diarrhea, gas, and/or bloating after they eat, and sometimes also don’t feel good after they eat any food at all. In addition to your digestive symptoms, these changes in your gut flora have such profound effects on both your immune system’s first and second lines of defense, and so it is not surprising that an imbalance has been linked to autoimmune diseases.

Researchers at the University of Arizona College of Medicine recently reviewed the literature on this topic and found good evidence that dysbiosis plays a role in
rheumatoid arthritis and, in animal studies, multiple sclerosis. (4) Because we are just now beginning to understand this relationship, research in this area should really explode in the years to come.

There are five types of dysbiosis. All of them have many symptoms in common such as:

- Constipation
- Diarrhea
- Gas
- Bloating
- abdominal cramps
- nausea
- feeling sick after eating

Unfortunately, you can also have more than one kind of dysbiosis at the same time! The mildest form of dysbiosis is insufficient good bacteria. Here you have a lack of the beneficial bacteria needed to balance the gut.

Next is small intestinal bacterial overgrowth (SIBO), which occurs in the upper part of the small intestine when bacteria from the colon grow in the wrong place. People with SIBO might also have stomach symptoms like heartburn and reflux.

The third type is immunosuppressive dysbiosis. Here toxins from harmful bacteria, yeast, or a parasite lower your levels of good bacteria and give off toxins that weaken or break down the gut wall lining and cause leaky gut syndrome. People often get this form of dysbiosis when they have an overgrowth of yeast in the body called candida, which is what happened to Linda. I discovered this after seeing the results of her stool test. Though a stool test is helpful, you do not need to do one to diagnose yourself. I’ll show how using the self-assessment in the next chapter, the Healing Your Gut Workbook. People with this kind of dysbiosis often have sensitivities to many different foods, feel tired and puffy and have difficulty concentrating right after eating or even the next day.

A fourth type is inflammatory dysbiosis, which is when the body has an exaggerated response to your body’s imbalance of good bacteria. Physical symptoms of this type of dysbiosis include muscle and joint pain in addition to digestive symptoms like gas and bloating. This form of dysbiosis is often seen in autoimmune diseases.
The last type is parasites, which can infect the digestive tract and put stress on the population of good bacteria. Parasites often cause diarrhea, cramping, and bloating. But they can also be silent, causing no obvious gut issues, but hives for no clear reason or food and environmental allergies that you have never had before. The only way to diagnose a parasite is to do a stool test.

All types of dysbiosis except the first one require the removal of bad bacteria, yeast, or parasites. And all of them can be thought of as infections that aren’t detected by routine medical tests or procedures. Dysbiosis can be caused by an overuse of antibiotics and antacids, including proton pump inhibitors that lower the production of acid in the stomach; gastrointestinal infections; gastrointestinal surgery; chronic digestion problems (because undigested foods wreak havoc in the intestines); chronic constipation; eating the standard American diet, which is very low in the fiber that your beneficial flora need to thrive and be healthy; and eating foods that your body’s immune system is reacting to. A good example of this is gluten, which causes many different kinds of reactions in the body, one of which is celiac disease, as we discussed in detail in Chapter 2 Using Food As Medicine. Chronic stress, which can lower the levels of the friendly flora in your gut can also cause dysbiosis.(9)

What’s really important to note is that even a small disruptive event in your gut, for example taking a short course of antibiotics for a sinus infection, can create a severe or chronic condition like yeast overgrowth or small intestinal bacterial overgrowth. That said, a relatively minor change—if carefully conceived—can sometimes restore that balance and, as a result, your gut health. For example, simply taking a daily probiotic supplement can create or stimulate major changes in your good bacteria, which ultimately decrease an allergic reaction or other symptoms that you may be having.

[The bottom line: dysbiosis can trigger or promote an autoimmune disease because the lack of healthy flora and influence of toxic, harmful flora cause the immune system to malfunction.] Dysbiosis can also lead to leaky gut syndrome, a problem on its own that we’ll discuss shortly. My point here is that finding out if you have dysbiosis and treating it is a foundational part of how I work with patients in my office and in the program I’m sharing in this book. Research shows that restoring healthy flora to
the gut helps improve immune function, and I am continually amazed at how balancing the good bacteria in the gut helps almost everyone feel better! (10, 11, 12)

**What Is Leaky Gut Syndrome?**

I’ve mentioned leaky gut syndrome a few times already, so let me finally explain it in some detail. Normally, the cells that line your intestines stick tightly together and form a protective barrier that is hard to penetrate. Sitting on top of the cell lining, is a layer of mucus that is also an important part of the barrier. This barrier’s job is to regulate everything that passes between the environment within your intestine and your body. Together with the immune cells located in your gut, this barrier helps control how your immune system reacts to anything foreign. When this barrier is weak or compromised, you have a condition called leaky gut syndrome. The problems caused by this condition are easier to understand if you imagine the barrier like a brick wall made of intestinal cells and what is called intercellular tight junctions, which are the “glue” that holds these cells together and forms the rest of the barrier. When the glue breaks down, there are cracks in between the cells that allow food particles and bacteria to literally leak into your bloodstream. (Hence the name “leaky gut syndrome.”) Researchers at the University of Maryland School of Medicine recently identified a molecule called zonulin, that is part of the glue. They found that when the zonulin is damaged, the result is leaky gut syndrome. (13)

Leaky gut allows anything that is inside your intestines to be “seen” by the immune system that is lying beneath your intestinal lining - like food proteins, good bacteria, harmful bacteria, yeast, and parasites. When this exposure is chronic, meaning it goes on and on for months, the immune reaction over time begins to malfunction, putting you at risk for an autoimmune disease. The researchers who identified zonulin found that in people who have a genetic predisposition to autoimmune disease, damaging zonulin and the glue that holds the cells together, caused them to
develop an autoimmune disease more often than people who had normal zonulin and glue, meaning a normal intestinal barrier.

This “glue” in between the cells gets damaged from things like dysbiosis from yeast, parasites or bad bacteria, severe stress, alcohol, certain medications, or after a virus or chemotherapy. When this happens, in addition to putting you at risk of developing an autoimmune disease, you are likely to develop food sensitivities. And these food sensitivities can happen not only in childhood, but later in life, too, something that comes as a surprise to most people especially if they had no food sensitivities or allergies as children. Maintaining a strong barrier is the best way to keep your immune system healthy, which as I have said, means that it knows when to turn on and off, knows the difference between self and foreigners and has tolerance to the good bacteria lining the digestive tract.

Some things that can cause leaky gut syndrome include:

- Antibiotic use. Typically this means taking antibiotics multiple times over multiple years, but taking them only one time can also be an issue
  - Acute trauma, emotional or physical, like surgery or food poisoning.
  - Chronic stress
  - Infections or exposures that were never resolved like traveler’s diarrhea or a parasite.
- Chronic dysbiosis. Bad bacteria can secrete enzymes that destroy the glue between the cells.
- Non steroidal anti-inflammatory (NSAID) medications like ibuprofen and other prescriptions
  - Toxins, like those secreted by the yeast candida. These can bind to part of the protective barrier breaking it down. They also can create pores across the membranes of the barrier.
- Alcoholism
What Does Leaky Gut Feel Like?

People with leaky gut syndrome often have digestive symptoms like constipation or gas and bloating after they eat. But it is also possible to have leaky gut syndrome and have absolutely no digestive symptoms at all. Instead, you might feel your hands and feet swell up after you eat, your muscles are tight and stiff in the morning, and you have brain fog and difficulty thinking after eating certain foods. These symptoms are a result of what’s called systemic inflammation, which simply means that there are irritating molecules running around your body after you eat certain foods. Sometimes it is hard to know which food is the culprit because it seems like you react to so many. I hear this story from my patients with bad leaky gut syndrome very often. Also, when you get symptoms that are nowhere near your stomach, like joint pain or headaches, you may not realize they are even related to your diet.

How Does Leaky Gut Cause Autoimmune Disease?

Let’s go into a bit more detail about how you can get autoimmune disease from leaky gut syndrome. The latest research and literature about leaky gut syndrome and autoimmune disease shows that almost every one with an autoimmune disease has leaky gut syndrome, even if they don’t have any gut symptoms. (14, 15) This lack of symptoms is why, with all my patients, I do a comprehensive digestive stool analysis to make sure their gut flora is healthy. But what is the link between leaky gut and autoimmune disease?

As we discussed, when your intestinal barrier is weak or broken down partially digested food or antigens from bacteria and yeast can seep out, bump into the lymphoid tissue and immune cells in your gut, and then also get into your bloodstream. Your immune cells react by making lots of T helper cells, which are directly in charge of revving up the killer cells and antibody producing cells to attack anything they don’t recognize as an invader. However, problems can occur when your body starts producing an abundance of T helper cells, especially if the T regulator cells don’t do their job to turn this attack off. These extra T helper cells can:
• rev up the killer T cells too much, prompting them to mistake your own tissues for foreign invaders.
• tell the killer cells to make inflammatory molecules that are sent out all over your body causing inflammation and pain at distant places.
• tell immune cells, called B cells, to make antibodies that bind to the foreigner and form something called an immune complex. These immune complexes can circulate throughout the body and build up in tissues, causing irritation, inflammation, and swelling. Since food is a big trigger for these kinds of reactions when you have leaky gut syndrome, I always recommend eliminating gluten, dairy, soy, corn, and eggs from your diet. (I haven’t told you to eliminate and test your sensitivity to eggs, yet, but don’t worry, it’s coming!) This can really improve symptoms dramatically. While you will still actually have a leaky gut when you are on an elimination diet, you are no longer eating the foods that trigger inflammation and worsen symptoms, so you begin to feel better immediately. Once you fix the leaky gut, you will be able to eat those foods again, but this will take at least six months. (I will show you how to heal your gut in the next chapter)
• tell the B cells to make antibodies to the foreigner; these antibodies can make a mistake and attack your own tissue instead, which is called “molecular mimicry” and is believed to be one of the ways that a viral infection and a food like gluten, can trigger autoimmune disease.
• get stuck “on” and so the immune response keeps going without stopping

Hopefully, you now understand that in order to reverse your immune disease or illness and have the healthiest immune system possible, we need to find what is causing the T cell imbalance, so that we can turn off the revved up T helper cells and calm down the killer cells, or the antibody producing cells. Helping your T regulator cells work better is important to help this balance. I know the way to do this and I will show you.

Both in my practice and in the latest research and scientific literature, I see that in order to fully heal and balance your immune system, we must heal your intestinal lining and make sure you have a good, intact barrier. Otherwise, your immune
imbalance and your reactions to food and other antigens will not be cured and will come back again and again. The first step is to treat the cause, which is usually dysbiosis or impaired digestion.

Now you can see why it is so important to figure out what’s going in your gut and heal your dysbiosis and/or leaky gut syndrome if you have them. To do so, let’s move on to the Healing Your Gut Workbook in the next chapter where you will find self-assessments for these conditions and a treatment plan based on the results. Just think: you’re getting closer and closer to healing your gut and feeling better.