

# A New View of Human Physiology

How understanding your body's interactive systems can unlock optimal health



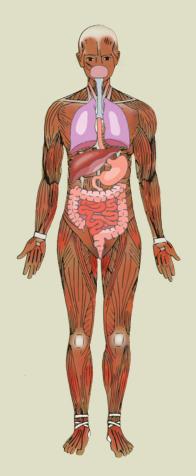
When I'm working with a new patient, I find it useful to talk a little about our basic human physiology. It's a subject that many of us encountered as early as middle school science class, but unless you choose a medicine- or biology-related course of study in college, you're not likely to gain much exposure to the topic beyond that – which is sort of a bummer.

Physiology considers all of the functions or activities of a particular organism and looks at the <u>"physical and chemical phenomena involved."</u> That covers an awful lot of ground. Understanding the systems that flow together to make you work is your best bet when it comes to advocating for yourself within the paradigm of standard medicine and it helps you properly place your diseases and symptoms in context. You're not "broken," your body is simply telling you that something is stuck.

Also unfortunate is the way that Western medicine tends to oversimplify human physiology. The body's beautiful, interwoven systems are often described and treated as distinct entities, easily placed in one category or box to be considered in isolation.

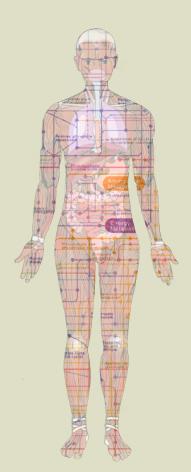
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## THE FIVE INTERWOVEN LAYERS



#### LAYER 1

I think of physiology in five layers. Each system is indeed a layer unto itself, but every layer interacts with another – sometimes three or more at one time. The first layer includes our muscles and organs, which are incorrectly considered to function like machines. In truth, this layer works more like an orchestra than a factory. These dense, localized systems digest and break food down into energy, circulate oxygen and nutrients, move toxins, build proteins, and provide movement and structure within the body.



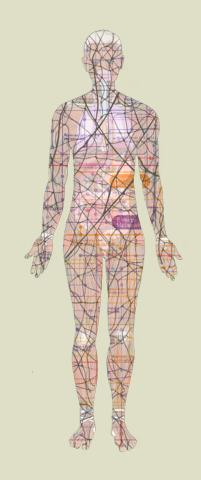
#### LAYER 2

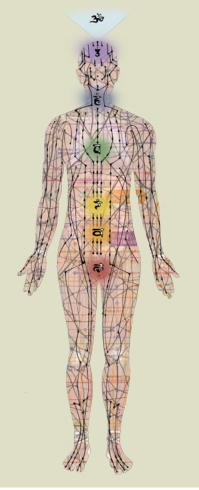
The next layer consists of our nervous, immune, and endocrine systems. These intricately related systems are diffuse with chemical signals and functions throughout the body and can't be said to reside in any one organ. They perform an amazing dance of communication that coordinates messaging between and among all of the denser glands and structures. The immune system (in the lymph nodes, spleen, bone marrow, and gut lining) defends us against invaders. The glands of the endocrine system send hormone signals that every cell of the body listens and responds to. Finally, the nervous system's "wiring" creates conscious thoughts, pain, and subconscious regulation.

## THE FIVE INTERWOVEN LAYERS

#### LAYER 3

The third layer is the connective tissue matrix, which acts much like a computer processor. It's a web of crystalline fibers that is semiconductive, which is one of the key properties of a silicon chip in a computer. This crystalline web extends from the nucleus of every cell, through the cell membrane, out into the extracellular space, and into the larger structures of the muscles, bones, fascia, and connective tissues of all organs. It has a structural function like the cables of a suspension bridge, but it also processes electromagnetic information and is therefore the mediator between the physical body and the energy body. The medical world's deepening understanding of the connective tissue matrix has recently been touted as the discovery of a new organ.





#### LAYER 4

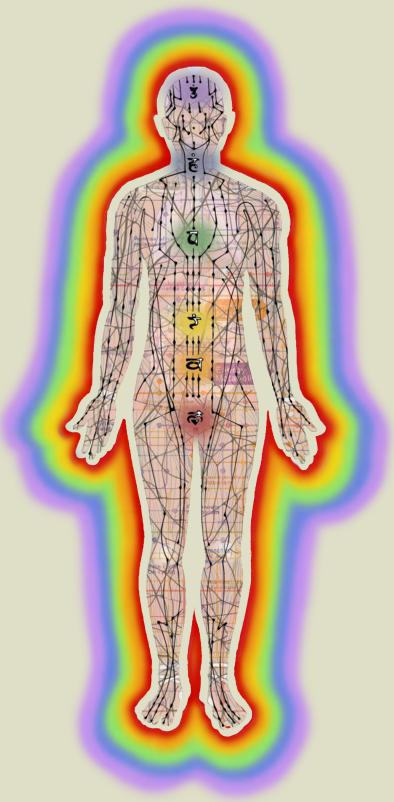
From the connective tissue layer, we move on to our electromagnetic anatomy. This layer is commonly referred to as chakras, meridians, nadis, or aura depending upon which traditional medicine practice you're familiar with. Regardless of the name, it's helpful to think of this system as a vital continuation of your physical physiology, at times serving as a blueprint for physical function but also enmeshed with the biological workings of the body.

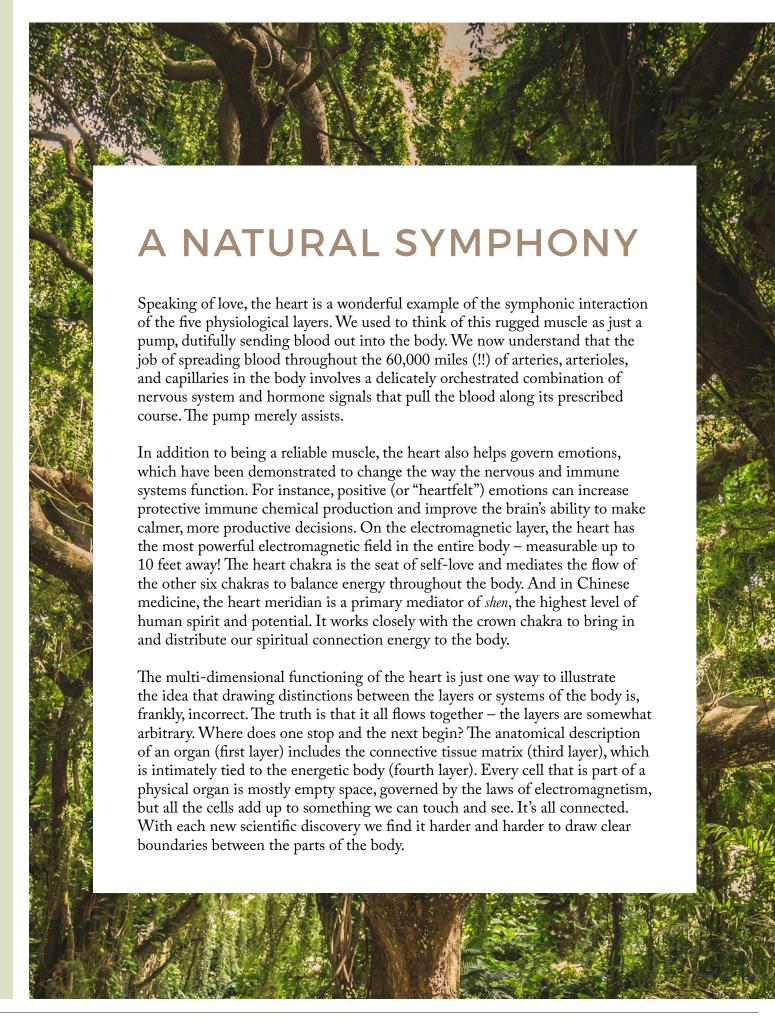
Take, for example, the third chakra, seated in the area of digestion. The language of this chakra might be more overtly focused on the energetic aspects of digestion in life, such as the processing of an experience or interaction, but a healthy third chakra is also necessary for optimal intestinal function. Physical digestion includes the breaking down of food into useful fuel to absorb and the elimination of waste. Similarly, a healthy third chakra helps you bring into your being what is nourishing or useful, and let go of what is toxic or waste. You've probably experienced firsthand how this "digestive" process can get screwed up when you go through a traumatic experience or even a stressful conversation.

# THE FIVE INTERWOVEN LAYERS

#### LAYER 5

As a final layer of human physiology, we must consider the spiritual connection that each of us has to something bigger than our own body. In fact, this layer might just be the thread that ties all the working parts together. Our felt experience of this connection is overwhelmingly strong as an infant, then diminishes as we go through the excitements and traumas of becoming individuals and trying to figure out our place in the world. Hopefully, we can strengthen the connection once again as we turn inward to find self-love, joy, peace in the present moment, and our mission in this world.





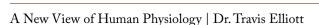
#### ORGANIC COMMUNICATION

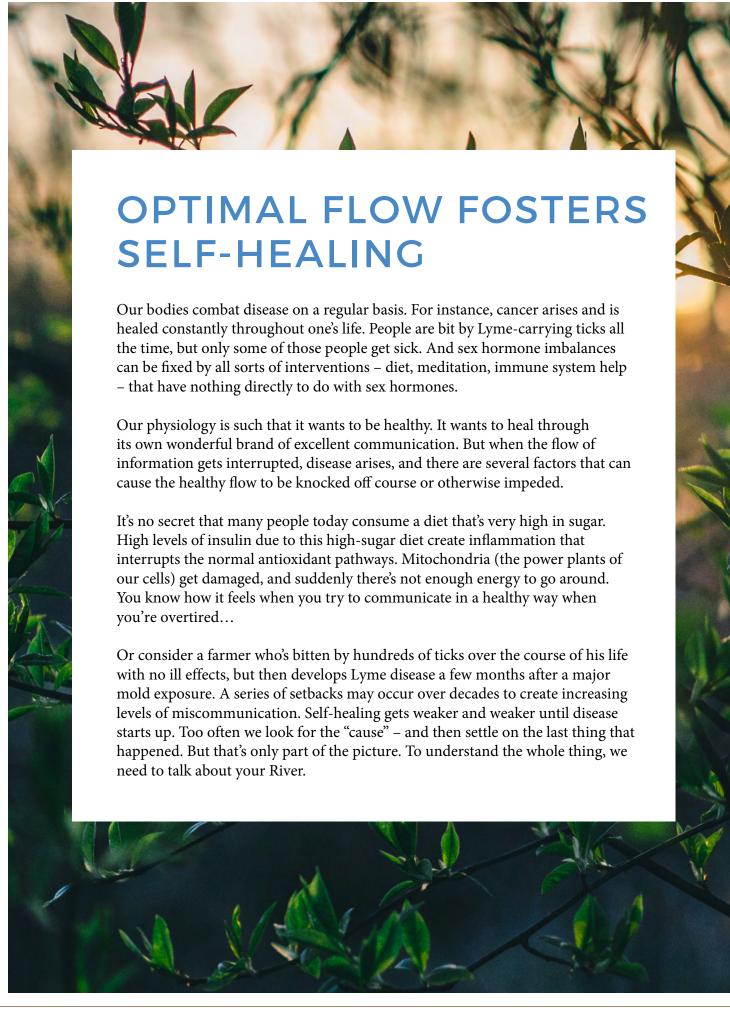
We rely on this complex, non-linear system to keep us healthy and vibrant. Like any system of its kind, the key to proper functioning is good communication. Think about your own family – or our country. Profound issues arise when people get closed off into isolated groups and communication breaks down. The flow of accurate, relevant information is critical to the health of any group, system, or organization.

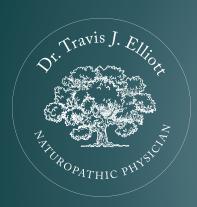
In human beings, the flow of information takes many forms and occurs on all levels. Here are just a few examples:

- Hormones can penetrate deeply into any cell nucleus in the body, directing changes in the way DNA codes are read.
- Neurotransmitters and electrical impulses in the nervous system talk directly to all organs, blood vessels, and even the spongy matrix between cells.
- Our thoughts can create a resonance that changes the physical structure of proteins sticking out of cell membranes, much like a radio signal changes the physical action of a speaker.

- Digestion depends on the sense of smell and taste to stimulate nervous system and hormone chemicals to prime the stomach and ready the release of enzymes and bile. It can also be slowed down by emotional stress.
- The belief system that "I am not allowed to cry" can create an emotional holding that prevents proper elimination by the bowels, lymph, liver, and lungs such that chemical toxicity can accumulate. This holding can eventually poison enzyme systems and cellular energy production in the mitochondria, leading to fatigue, muscle pain, and depression.
- The feeling of being at peace and connected to something bigger than yourself whether it's during a walk in the woods, a messiah chorus, a near-death experience, an intimate moment with a stranger, or losing yourself in the synchronous movements of a college rowing team has dramatic and immediate effects on the flexibility of the nervous system, stress hormones, physical performance, emotions, cancer progression, digestion, and... well, any other body function.







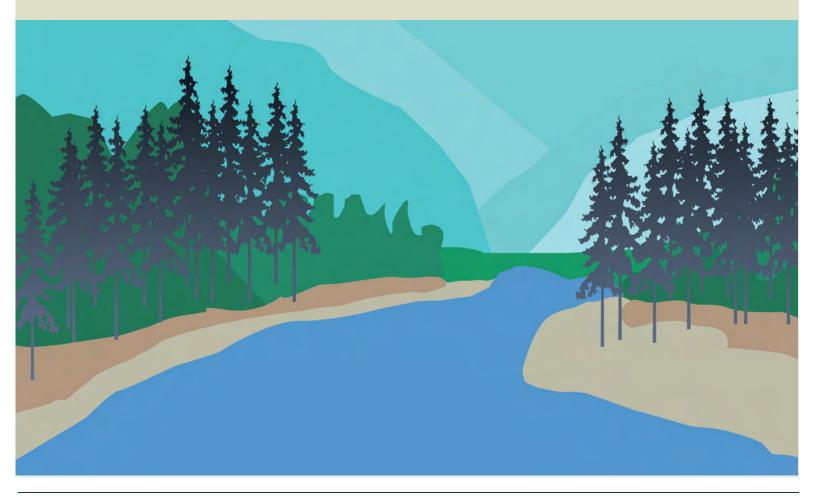
# In the Flow \_\_\_\_\_\_ The Importance of a Strong Physiologic Current

# **DEFINING "FLOW"**

When you hear the word "flow," what do you think of? What are some of the images or words that spring to mind? Tears flow, sometimes. "Flow" describes a popular style of yoga. Some people may think of money – cash flow. But my understanding of this idea comes directly from helping my sick patients get well. When I think of "flow," I think of health, and in my mind I see a river.

I believe this idea of visualizing a human body as a river is a powerful analogy that can help us heal chronic disease. As I described in the last chapter, the flow of information between all layers of our physiology is a foundation of optimal health. The problem is that physiologic flow is rarely addressed by either conventional or alternative physicians. Instead, we are trained as mechanics for a body that is considered, when sick, to be broken.

But what would happen if we centered our health care around the flow of information and the flow of self-healing instead? What would happen if instead of cataloging everything that is wrong in a patient we looked for the key obstacles that were blocking this self-healing? What would medicine look like if we focused less on deficiencies and broken parts and instead worked with each patient's innate ability to heal? By working to release blockages to healing, we can partner with each patient's restorative flow as powerful medicine in its own right.



Over the past three years, I've gained the tools and ability to work in conjunction with my patients' self-healing, and to act less and less like a mechanic trying to fix broken parts. This new way of working with my patients has taught me one thing over and over: flow is king. And in order to help my patients understand how we are working together to heal their disease, we end up talking a lot about rivers.

Like human physiology, a healthy river in nature has good flow. The quality of that flow depends on the health of the parts (the water, the bank, and the riverbed) and the way they work together. More specifically, a river needs clean water that's full of healthy organisms, a strong riverbank with diverse vegetation that can handle both droughts and spring floods, and then room within the riverbed for shifts in flow depending on the environment.



If any of these elements are missing or damaged, the river will become sick. The list of potentially harmful agents is long and varied, just as it is for humans:

- Chemical and organic pollution
- · Loss of vegetation that leads to erosion and flooding
- Overgrowth of plants in the water
- Invasive species
- Dredging
- Damming
- Change in temperature due to deforestation or warming climate
- Pulling out too much water for irrigation or municipal water

Fortunately, we often know how to help make a river healthy again. The solution may be to slow the dumping of toxins or speed up the outflow. In some cases, all that's needed is to restore the water volume or to release restrictions so that the river can safely expand during a flood. Whatever the need, the goal is to improve the flow.

# STRENGTHENING THE CURRENT



When scientists and others consider how to help a river in trouble, there are four general options:

- Strengthen the current
- Repair the damage
- Restore the deep connection a river has to the earth as a whole
- Restore the river's ability to subtly respond to changes in its environment (i.e. changes in rainfall, changes in snowpack, small-scale natural or artificial disasters)

Based on my study of how the natural world works and the experience of treating hundreds of patients in my office, I've observed a strong correlation between these categories and the most effective courses of action for people.



Let's take a look at the first option: strengthen the current. In nature, we might remove a dam or release a reservoir, thereby increasing the water volume and outflow in the river, resulting in a stronger current. In the human body, this is accomplished a couple of ways.

First, there's detoxing, which – in practical terms – means increasing the flow of blood, lymph and other fluids through the liver and kidneys to speed up the body's normal cleansing function. The reason for the weak flow could be rooted in an exposure to high amounts of chemicals or the slow accumulation of toxins over time. The accumulation may also be of normal waste products created by your cells that become inflammatory when they accumulate. Either way, the goal is to get those toxins and waste flowing (via the blood, lymph, and other fluids) through the body's natural detoxifiers.

Childhood experience is another common reason for weakened flow in the human body. Just as engineers may need to break up a canal to return a river to its natural, dynamic flow, we sometimes need to eliminate the subconscious blockages created by traumas or other hard lessons when we were very young.

Imagine a young boy who is told that, in his family, crying is not allowed. The efforts to suppress his grief become habitual, and over time this natural process hardens and becomes stuck. Or imagine a girl who suffers a childhood trauma. Pulling her way out of the pain, she decides to do whatever it takes to "never feel this way again." A desire and need for control sets in and permeates all aspects of her physiology.

The problem is that those emotions these children swore off – fear, grief, pain – are all natural and necessary processes. They need these emotions to navigate the normal aspects of life and childhood. What's more, these difficult but essential emotions also have roles in the physical body. By suppressing these emotions, their own natural physiology is suppressed through the interconnections of the nervous, hormone, digestive, and immune systems.

In either case their strong desire to avoid certain feelings can – via the power of the fight/flight part of the nervous system – slow detoxification flow causing inflammation that could lead to fibromyalgia, autoimmune issues like Hashimoto's, digestive problems, depression, etc. No other treatments or diets that they might try over the years are going to work unless the deep-seated need for control – which was put in place when they were children – is addressed.

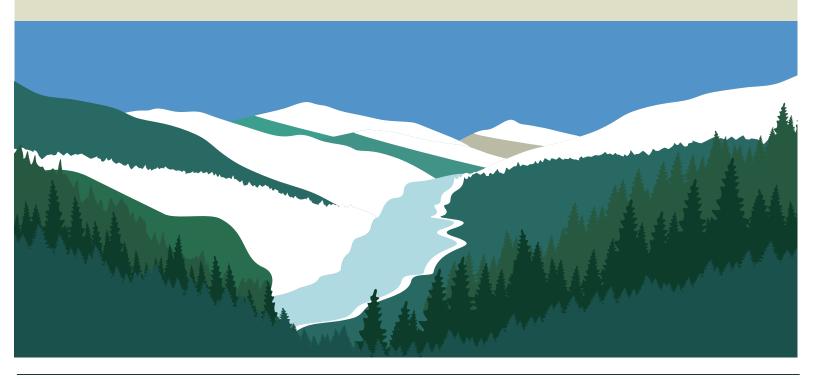
# CREATING SPACE FOR NUTRITION TO FLOW

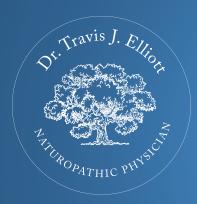
What I love about the River analogy is that it also points to a deeper aspect of healing than releasing blockages and detoxification. Increasing the outflow of a river doesn't do any good if there isn't a replenishing source of water at its head. If this is also true for a human body, what is our headwater? What is our source? And if we could identify that source, is it driving our healing?

Whether a snowmelt or underground spring or regular rainfall, the headwater of a river is its deepest connection to a greater ecosystem. Similarly, it is my contention that increasing flow in our own River creates space for a deeper connection to something bigger than ourselves. This concept is my definition of spirituality, and when we create space in the the body, we automatically increase "source nutrition."

We all access spiritual or source nutrition during times of connection, as I described in the last chapter. But how deeply into all the layers of our physiology is this nutrition able to penetrate? This is not just a question of spirit or the mind, as I mean "all layers" quite literally. Is the energy of spiritual connection penetrating your muscles? Is it getting down to your DNA? Improving outflow unavoidably increases self-healing flow. Then, like sunlight pouring down through clean water, the source nutrition helps organize, harmonize, and regulate physiology.

This source or spiritual nutrition can flow in the 7th (crown) chakra and move through all densities of the body, nutrifying even the deepest nooks and crannies. But toxins, belief systems, infections, and blockages of all kinds can refract this nutrition, reducing the flow of our physiology — the flow of our body's self-healing consciousness. As the flow improves, it pushes your body to do more work and to function at a higher level. Are you up to the task? Oftentimes, the answer is "not yet."





# Repairing — the Damage

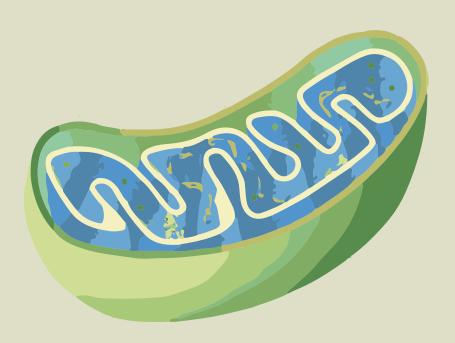
## REPAIRING THE DAMAGE

As my work with patients has become more holistic, I've been impressed by the self-healing my patients can do. One woman was astounded that after three visits her bloating and nausea disappeared. "But we didn't even do anything related to digestion," she exclaimed. What we did do was remove obstacles to her physiologic flow. Her nervous and detoxification systems improved and she was able to take care of her digestive imbalances on her own. In the past, I would have zeroed in on her gastrointestinal issues at the beginning, and she would have likely joined the long list of patients who had their chief symptoms only temporarily improve.

The key to this change in my approach has been a shift away from a "doctor as mechanic" perspective to one that honors the wisdom and power of my patients' ability to heal themselves. However, every patient has their limit, and eventually they need extra help to repair what their own body cannot. This type of damage can take many forms, including nerve tissue destruction, a "leaky" gut lining, or a damaged thyroid gland. But restoring or repairing mitochondrial function is by far the most common concern of this sort that I see in my patients. Helping to heal the beautiful and complex mitochondria is often the critical next step in the larger healing process.

Mitochondria are important organelles in every cell. I think of them like little furnaces. They take fuel (breakdown products of sugar and fats) and combine it with oxygen to produce little packets of energy called ATP. These packets are like tiny sticks of dynamite that can be used all over the body to get work done. Mitochondrial support may repair damage to the furnace itself and/or shuttle in more fuel.

As I mentioned in the previous chapter, once your flow is stronger, your body will be asked to do more work. Your cells will strive to function at a higher level and every physical task of the body will require more energy. Consequently, biochemical assembly lines work harder to burn more fuel and this work puts more pressure on the particularly complex workings of the mitochondria. While the increased self-healing can fix some of what's broken and lift up the function of the body, the mitochondria are fragile and can remain damaged.

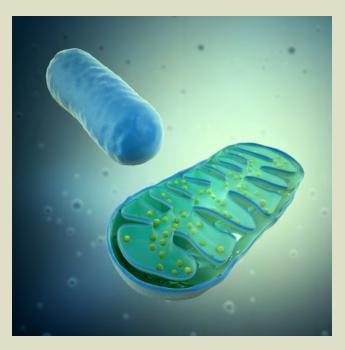




To give you an idea of how important mitochondria are to a healthy flow, here are just a few examples of the countless tasks they enable with their energy production:

- 1. Muscles need ATP to relax after every contraction. They use the energy from the mitochondria to relax, and then they spontaneously contract. The heart uses this process repeatedly to beat.
- 2. Neurons also need ATP to stay relaxed. Like a frazzled and tired human, an unrelaxed neuron is overly sensitive and reacts or sends signals when it shouldn't. It then gets exhausted and can't function at all for a little while. This means that low mitochondria function can create anxiety, insomnia, and poor pain processing (as in the case of fibromyalgia).
- 3. Mitochondria play a big role in liver health and detoxification. The liver is the workhorse of the body and therefore requires a lot of energy. Poor mitochondria function from toxicity, for example, can slow down the processing of the same toxins, leading to further mitochondrial damage, further slowing detox, and so on.
- 4. Research in the last 10 years has confirmed that mitochondria are a critical part of immune system functioning. Immune system health requires a tightly choreographed dance of dozens of cell types and hundreds of signaling chemicals. Cells have to listen, change shape, change function, send out new signals all in response to the actions of other cells, encounters with infections and tissue damage, and much more. Mitochondria help power this incredible system.
- 5. Mitochondria assist with cell metabolism. The heart, nervous system, immune system, and every other system in the body depend on mitochondria because they give the cells of that system the energy to run all their biochemical pathways. Imagine giant factories trying to run without electricity. Imagine a car trying to run without a battery under the hood or fuel in the tank. Properly functioning mitochondria are essential.

### FIXING THE MITOCHONDRIA ISSUE



While there are severe diseases related to dysfunctional mitochondria, that's not what most of us have to deal with. Much more common is the discovery of mitochondria that are sub-optimal in function. Energy production in mitochondria depends on the TCA cycle and the electron transport chain. These delicate processes can be slowed down by inflammation, toxicity, infection, emotional stress, and other factors. Even small slow-downs in energy production (similar to a weak battery) can ripple through the systems of the body, setting up feedback loops and reverberations with a compounding negative effect on your health. Do you know someone who suddenly develops allergies as an adult? Or how about the feeling of stiff muscles as we age, declining memory, or anxiety after exposure to toxic chemicals? It's all mitochondrial inefficiency.

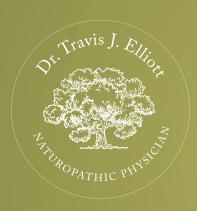
Repairing the damage to mitochondria is a twofold process. It means improving the function of the ones you have and greatly increasing your rate of producing new ones. Nutrients like lipoic acid, carnitine, glutathione, phospholipids, coQ10, ribose, PQQ, and others can help with overall mitochondrial function. In my office, I have three different combinations of these nutrients to more precisely repair and increase the function of existing mitochondria. The formulas are important because high doses of these nutrients are essential to making tangible changes. In the short term, it may mean taking many capsules a day, but the long-term payoff is worth it.

To increase production of new mitochondria, lifestyle strategies can be critical. Examples include a lower carb diet, intermittent fasting, and high-intensity interval training (HIIT).

Since mitochondrial function affects so many systems of the body, it's hard to predict exactly how symptoms might change. Common sense is a good guide in this case. If mitochondrial function is the limiting factor in your health, taking therapeutic doses of the above nutrients should create tangible change in your body. You may notice a reduction in anxiety, more energy, greater resistance to illness, reduced pain, or some other change related to a part of your body that is out of balance.

Of course, the repair phase of treatment is not limited to mitochondria. It's the focus of this chapter because errors in the fragile pathways of the mitochondria seem to be most resistant to the process of increased self-healing.

When more mitochondria are humming along at full speed and your physiology is flowing with more energy, a common next stage is optimizing communication.



# Improving Molecular Communication —

#### IMPROVING MOLECULAR COMMUNICATION

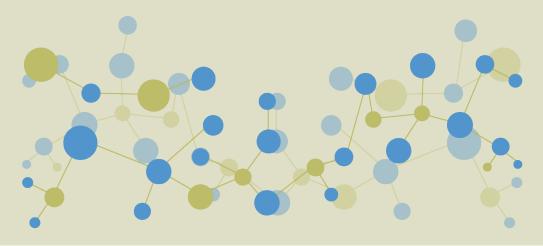
There are three general steps that are the core of my practice. The specific treatments along the path to optimal health vary from person to person but the three main steps are the same. We discussed improving the flow of your river in chapter 2 and talked about repairing damage, such as sub-par mitochondrial function, in chapter 3. Finally, we'll explore the idea of improving molecular communication.

At this point in the process we're fine-tuning function, which can be done via the increased flexibility and health of hormones, immune signals, neurotransmitters, and more. The adrenals and pituitary and immune cells are stronger and more functional, but oftentimes things are now happening too fast for efficient communication. This can lead to hormone imbalances, mood issues from neurotransmitters being off, and weight problems from blood sugar sensitivities. In other words, there could be great improvements in your underlying health, but you may still have symptoms because of communication issues within the body.

As always, addressing this issue in your body is highly individual, but here are some things that are commonly used in my practice.

- Glandular organ support: Genestra TMG is a comprehensive formula that offers baseline nutrition to glands and organs that functions as a sort of blueprint for getting organized and talking to each other.
- Sound Wave Energy therapy: I often use Nicole LaVoie's remarkable audio tracks that present the body with specific frequencies to optimize function.
- Plant medicines: Tinctures, capsules, low-dose homeopathy, European phytotherapy... I use many forms of plant medicine in my office and a targeted prescription can help balance the communication of the organs or immune system in a powerful way.

A simple example is a patient who arrived at the office with an autoimmune thyroid disease. Testing revealed that she had elevated levels of mercury in her body, so we first **improved the flow** of her physiology with liposomal glutathione. After the metals had left her system, we next used nutrition to help **repair mitochondria** in the form of lipoic acid, carnitine, and a substance called PQQ. Finally, she was able to use fish oil and B-complex vitamins to **improve metabolic communication** and her autoimmune disease resolved.



### RIVERS TWIST AND TURN

However, a healing path is not always tidy. Patients may cycle through these three main steps many times in a long term treatment. I think of the process as a spiral of discrete steps – with each one increasing flow, repairing damage, or improving communication, over and over. Each stretch of the River brings one to a higher level of health and addresses dysfunction on different levels of physiology.

My experience with a more recent patient with thyroid disease is a reflection of the complex subtlety of this journey. Like the first patient, detoxification with glutathione and bitter herbs was the necessary first step. But before she was able to more fully detox, we identified a kind of "stone of resignation" within the energetics of her nervous system that was preventing optimal flow. After treatment with the Sound Wave Energy mentioned above, we were able to resume her detox in the third stage of her treatment plan, using herbs that were active in both her physical and energetic bodies. It was only after these **three stages of improving flow** were complete that we could move on to improving the cellular communication within her thyroid.

You may notice that in the above example we skipped the mitochondrial repair stage. Why? What happened? The stages of Flow — Repair — Communication are useful as guiding principles, but stages can be skipped based on overall health and other treatments one may have completed in the past. As I said, every health journey is unique, especially since I started using such a sensitive assessment tool with my patients.



#### TRUST YOUR BODY - FOLLOW YOUR RIVER

I've been hoping that by using the River analogy and its stages of Flow, Repair, and Communication as a framework, I could help people figure out a different way to move forward with their own health issues, even if they are not my patient. For example, if you're stuck, maybe you could detox, repair mitochondria, and take some balancing herbs and you will be helped. This rhythm seems to be foundational to our health.

But I also fear that this advice has its limitations. After all, as I pointed out above, the stages can be rough and they don't always happen in sequence. And even if you know what stage you are in (e.g. "improve flow"), the medicine you may need to move forward can be hard to figure out.

Upon reflection, I realized the specific gift I can offer from my practice is not any particular protocol, but the idea of the River itself. Understanding how our health relates to the dynamic ecosystem of a river is powerful



because when we are stuck, we can go back to the analogy and ask, "Okay, what about a river describes what I'm going through right now? And how does that help me understand my body?" It's a frame of mind that allows you to access your own intuition; it's a framework that takes your linear brain out of the driver's seat so that it can observe without being in control.

Hopefully the mitochondria information and communication information (and detox, and...) will all be useful to you. But at the end of the day, the big picture of the River is the key. Thinking about your River can help you understand the ups and downs of your health care journey, no matter what process you're following or which doctors you are working with.

I tell my patients that there are five basic assumptions that are critical to realize:

- 1. You are the River. The water flowing through your River is your own self-healing flow. It is what powers this journey to wellness and it's what distinguishes you from a simple machine like a car or a computer.
- 2. We don't know how long your river is or how many obstacles and rapids there are.
- 3. Once you start moving down your river with purpose, it's hard to stop. Navigating a river isn't like going for a jog. You can't just stop anytime you want. Dipping into the current involves giving up some control.

#### TRUST YOUR BODY — FOLLOW YOUR RIVER



- 4. The flow can be steady, strong, and peaceful; other times it is turbulent and more chaotic. Changes in how you feel (for better or worse) may correspond to your arrival at the next stage of your River that needs support. It can be hard, but it's important to trust that your body knows how to carry you through. Often, a patient has an old symptom come back and is alarmed at what feels like her health going backwards. But if I hear of an old rash coming back or the return of a headache that she "hasn't had since high school," I get excited. I know that her body is stronger now (better flow!) and is digging deep to solve old problems that previously had to be set aside.
- 5. Trusting your body and "going with the flow" is the most efficient way to heal at a deep level. I always explain as much as I can to my patients, but it's essential to allow yourself to let go of the need to always know "why?" The complexities of our bodies and our diseases cannot be completely understood. Trust that your body is better equipped now to process the root causes of those symptoms.

Ultimately, when the going is rough, search for strategies that focus on your heart, rather than abandoning ship. Stay present and try your damndest to go with the flow. It is your brain's responsibility to be hypervigilant. But this hypervigilance can suppress the intuitive, heart-based intelligence that needs to have equal footing. Trust this self-wisdom, and when you need it, ask for help.