

## FUNCTIONAL BIO-ANALYSIS – WHAT, HOW, WHY?

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### WHAT IS IT?

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This chapter of *Hope for Health* details how Functional Bio-Analysis is even possible. It may be a bit complex, but this is necessary for academic reasons and to satisfy the natural questions generated by such a topic. However, some of you may want to start by flipping through the *Table of Contents* or the *Index* to find the greatest areas of concern in your own life. Turn to those pages and see how FBA works through the natural metabolic pathways to find the cause and the cure. Then, return to *Functional Bio-Analysis – What? How? Why?* for detailed explanations of how it is all possible.

Since the 1960s, alternative medicine, in its various forms, has advanced in U.S. culture. During this time, the interest in all things “natural” led to an explosion of alternative healing techniques, many of which had no scientific foundation. These techniques failed to withstand speculation, evaluation and attack, proving to be little more than fads or trends. In the competitive world of health care, those alternative techniques that have endured have done so by their own merits. The fact they are still here at present, despite conspiratorial attacks to eliminate some of them,<sup>i</sup> demonstrates they have received the stamp of approval from the public at large and now no longer carry the somewhat derogatory title of “alternative” but are instead complementary.

Applied Kinesiology (AK) is one technique that has survived. AK, despite past and present efforts to discredit its efficacy, has endured due to its success in areas where traditional medicine has failed and continues to fail. At its core, AK was the first technique to incorporate the manual muscle test, or MMT,<sup>ii</sup> as one of its primary methods of evaluation, believing *practitioners can use the muscles of the body as an analytical tool to evaluate human function.*<sup>iii</sup>

With this realization, vast implications were foreseen and not surprisingly, many offshoots were conceived. Emerging under the “kinesiology” banner, techniques such as Clinical Kinesiology, Quantum Kinesiology, Nutrition Response Testing and Muscle Response Testing<sup>iv</sup> were born. Competition between these groups led to new discoveries, refinements and innovations, making already good procedures more efficient and effective. The worlds of biochemistry, neurology and nutritional research kept pace as well, providing the scientific foundation upon which the regular breakthroughs could rest. Pioneers in AK such as Dr. Walter Schmitt,<sup>v</sup> Dr. Chris Astil-Smith,<sup>vi</sup> and Dr. Michael Lebowitz<sup>vii</sup> developed entire protocols and techniques to address the biochemistry and nutritional needs of the body. Their work, and that of many others, is the foundation upon which FBA now stands.

***Functional Bio-Analysis (FBA) is a science-based complementary medicine technique, helping knowledgeable practitioners navigate the neurological and energetic pathways present in all people.***

*The primary goal of FBA is to tap into the body's own natural monitoring system in order to evaluate the functions within. FBA, like AK, is done with precise manual muscle testing.*

With FBA, practitioners can follow ordered steps to find the nutrients the body needs most. This approach produces a hormetic effect. Hormesis has Greek origins and means, “to set in motion, impel, or urge on.” A hormetic nutrient may be a single vitamin, herb or other agent that positively impacts multiple systems simultaneously.

One of the first things an FBA practitioner will do is find the primary energetic points (PEPs). These points are well known and have been used for thousands of years in classical acupuncture. With FBA, it is possible to identify the PEPs with the highest priority and then all the remaining PEPs in their order of importance. Through this hierarchy, health professionals can address the primary things first, saving time and resources often wasted on less significant issues.

Along the body's structured pathway, there are many other fascinating and pertinent tests an experienced practitioner can add as he or she deems necessary according to the symptoms and metabolic needs of the patient. For instance, the three primary colors of the visual spectrum (green, red and violet) relate to specific genetic tendencies. Each color is associated with a major organ weakness and food intolerance as well as with other health-disrupting tendencies. Just knowing these pieces of information would help millions of people manage and maintain their health. (For more information, see the chapter, *What Color Are You?*). There are also eight eye positions, which reveal whether major minerals such as calcium, magnesium, iron and zinc are out of balance; and numerous soft-tissue tests that make known the integrity of the skin, hair and joints.

The success of FBA practitioners is dependent upon their knowledge of physiologic pathways, their ability to use the craft of manual muscle testing and their knowledge of standard and special diagnostic tests. In fact, FBA is the perfect bridge between the worlds of functional and energetic medicine. Functional medicine doctors analyze standard diagnostic tests, such as blood work, and then recommend natural remedies. Energetic medicine doctors utilize the body itself as a diagnostic tool: FBA practitioners do both.

#### FOUR KEY PRINCIPLES

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FBA operates on four key principles. **First**, when a functional imbalance or even a disease is present, it indicates the brain/body has recognized and pinpointed the problem, but for a variety of reasons, lacks the means to restore its own balance, or homeostasis. When this occurs, it does the next best thing—it reveals the areas in need via well recognized energetic points located on acupuncture meridians. The FBA practitioner needs only to follow the manifested energetic road map as revealed through the PEPs in order to locate the most significant imbalances.

**Second**, there is a hierarchy. In other words, the body knows what it needs fixed first and the order thereafter. This is critical. Most techniques will start at the patient's complaint. However, most

complaints are downstream problems. Locating the headwaters and addressing the issues found at the source is the approach that produces “miracles.”

**Third**, fixing the ordered steps along the way requires hormetic nutrients. These are the foundational nutrients that affect vast numbers of metabolic functions. Hormetic nutrients do the heavy lifting and include specific forms of nutrients such as calcium, magnesium, B6, folic acid and many others. Utilizing hormetic nutrients exclusively will make recovery faster and more permanent and prevent Shopping Bag Syndrome (SBS), the rapidly growing phenomenon of using a shopping-bag’s worth of daily supplements as part of one’s health routine.

**Fourth**, manual muscle testing is currently the only method of human analysis available to navigate the body’s energetic healing map according to its revealed priority. However, proper manual muscle testing is essential to acquire accurate data and avoid false findings—an all too common occurrence.

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### MANUAL MUSCLE TESTING (MMT) - HOW IS IT POSSIBLE?

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Considering the four principles above, the one that generates the most confusion and perhaps ire is manual muscle testing. The theory behind MMT is fully compatible with the classical understanding of neurology, physiology and electromagnetic principles.<sup>viii</sup> There are no concepts based on mysterious forces or that lack a scientific rationale. **MMT is simply a change in the tone of a muscle from strong (facilitated) to weak (inhibited), or from weak to strong, in the presence of a given stimulus.**

Many of the theories explaining how muscle testing works, its validity and its meaning to the rest of the body, have sprung from Applied Kinesiology. Researchers and practitioners have studied these theories for decades.<sup>ix</sup> In classical AK teaching, all muscles have a relationship with an organ, as indicated in the following chart.

Muscle	Related Organ
Pectoralis Major Sternal	Liver
Middle Deltoid	Lungs
Quadriceps	Small Intestine
Hamstrings	Large Intestine

Table 1: Examples of Muscle/Organ Relationships

The connections between the muscles and the organs above are just a small piece of the phenomenon called Bio-unity. This simply means that every part connects to every other part, and every system connects to every other system. Because of this inter-connected relationship, a change or modification in any one part will have a corresponding effect on every other part. If the theory of Bio-unity holds true, a practitioner should be able to find any major imbalance, be it a nutritional deficiency, emotional disturbance, inflammatory response or anything else, will be manifested in the body through various systems. For instance, if a person has an inflammatory condition, a doctor can perform a blood test to check for certain inflammatory chemicals, such as C-reactive protein and homocysteine. These are the chemical signs, but are there neurological, energetic, neuromuscular and even emotional signs of inflammation? The answer is yes. This reality is consistent for any imbalance within the body.

A good illustration is the state of depression. The neuromuscular sign with depression is a slumped posture, the chemical sign is low serotonin, the energetic sign is a disrupted flow through the bladder meridian, the neurological sign has to do with specific disruptions in right- and left-brain function and the emotional sign is the depression itself. In other words, all the systems of the body have a road map the practitioner may follow in order to arrive at the patient's most pressing needs. Some roads are easier to traverse than others. FBA is based on the concepts of Bio-unity and utilizes MMT to tap into these systems in an orderly, repeatable and reproducible fashion.

With Bio-unity, evaluating groups of muscles and finding weaknesses where strength should be present could provide significant insight into the general function of the body. For instance, a strong chest muscle called the pectoralis major sternal, or PMS, is related to the liver.<sup>x</sup> If something compromises liver function in some way, it is likely the function of the PMS muscle will also be less than optimal and likely will not test strong.

For the purposes of this book, MMT moves a step further. Practitioners can use FBA to not only analyze the muscles themselves but also every substance that influences physiologic function such as hormones, neurotransmitters, environmental chemicals and even foods. It is possible for the body to evaluate these minute substances, because it is able to detect and react to whatever stimulus is present through an intricate and fascinating process outside of the five senses.

Most people understand the human body detects stimuli through taste, touch, smell, sound and sight. What they may not understand is the plethora of subtle yet meaningful changes taking place when each of these senses is stirred, or the even more powerful detection system that governs all the body does and is capable of doing. **This detection system goes beyond the five senses to a sixth sense, an electromagnetic sense that can detect a substance via its natural and ever-present electrical emanations.**

In reality, the human body is so sensitive there need not be a substance at all. Just a thought or an emotion could be enough to generate a change in muscle response. But before going too far with a discussion on these intriguing phenomena, one should comprehend the foundation for the technique.

The skeptic doubts the possibility a small stimulus such as a smell, taste or thought could be a profound enough trigger in the nervous system to alter the tone of a strong muscle, making it temporarily weak. And as for a substance merely in contact with the body doing the same thing, clearly the skeptic would find this idea is not believable. The criticism seems reasonable on its face, because it appears to fit everyday experience. No one, they would argue, has suddenly fallen to the floor after smelling peanuts, petting a cat or breathing in pollen. How then could someone say that these same things could make the muscle of an allergic person shut off when they are simply exposed to them? And yet, this is exactly what happens every day in offices of muscle testing practitioners across the country and the world.

So, how is this possible? Is it the trickery of the practitioner as he shamelessly manipulates the unsuspecting patient with sleight of hand and mesmeristic maneuvers? Or, are there very real and significant phenomena taking place that are poorly understood and yet profound concerning the function of the human body and even the future potential of medicine?

### THE BODY REACTS TO EVERYTHING

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Much of the body's adaptation to the environment is performed automatically through reflexes. Reflexes are one form of biofeedback. The biofeedback measured with MMT is similar to reflex responses experienced every moment through the five senses. The scientific world<sup>xi</sup> well understands reflexive responses and groups them into several categories.<sup>xii</sup> Stretch reflexes, or deep tendon reflexes, are the kind doctors test when tapping the end of the knee with a rubber hammer.<sup>xiii</sup> Superficial reflexes alert the body to the slightest changes in sensation. Visceral, or autonomic, reflexes help the body to regulate changes in light or blood pressure. So-called primitive reflexes help to keep people from falling and help babies to root and suck.<sup>xiv</sup> In other words, **if the body needs it, there is a reflex to help achieve it; if the body can sense it, there is a reflex to help protect against it.**

Examples of reflexes from the five senses are familiar, since they fit everyday experience. Everyone has been hungry, smelled a pleasant food and experienced salivation and the stomach rumblings that followed. An unpleasant smell or taste, on the other hand, elicits a strong and immediate negative reflexive reaction: squinting of the face and jerking back the head as if to pull away. These are the involuntary responses common with exposure to pleasant and unpleasant stimuli.<sup>xv</sup> An experience—even when recalled through memory alone—creates an instant physiological and emotional change. If the memory is enjoyable, the response may be a smile, laugh or “warm feeling.” If the memory is upsetting, recognizable emotional and physical signs will manifest.

If an emotional stimulus is long lasting, profound signs may be present. For example, depression generates a slumped posture with shoulders rolled forward, head tilted down and torso bent slightly forward;<sup>xvi</sup> whereas, the opposite is present in a proud or confident person who, in a military fashion, stands straight and tall with his shoulders rolled back. These responses demonstrate generally that **the**

**body reacts through its muscles to stimuli.** With this basic tenet established, it is now safe to move into more precise illustrations.

To prevent injury, the body has a sophisticated neurological warning system to protect itself from mechanical injury, i.e. strains, sprains and soft tissue tears. Located in the musculotendinous junction, the place where the muscle stops and the tendon starts, are specialized cells called golgi tendon organs (GTOs). They are kill switches, and it is their job to turn off a contracting muscle if it pulls too hard and/or to protect the muscle no matter how intense the contraction. If GTOs weren't there, tendons would rip from bones during extreme exertion, or the muscle could continue to contract at the onset of injury, when ceasing to contract would be more beneficial.<sup>xvii</sup> So when injury is imminent, the GTOs signal the brain, which turns off the contracting muscle through a process called the autogenic inhibition reflex.<sup>xviii</sup> Likewise there are kill switches in the middle, or belly, of all muscles called spindle cells. Their job is to prevent overstretching. This is called the stretch reflex.<sup>xix</sup> If a muscle is in the process of being overstretched, the muscle spindles signal the brain, which shuts off all the opposing muscles creating the stretch. These examples show something very important with regard to the validity of manual muscle testing: **There are neurologically understood ways in which the body voluntarily turns off its own muscles in response to stimuli, especially those stimuli it deems potentially harmful.**

So far, the examples have shown the body responds through its muscles to stimuli via built-in reflexes and confirmed the body does so immediately and in very different ways depending on the nature of the stimulus, good or bad, healthy or harmful. But what about the big question? What about energetic stimuli—those not detected by the five senses? Is the human body sensitive enough to perceive and protect itself from them the same way it can to mechanical stimulation? The answer to this question rests in three things: First, understanding the capabilities of the nervous system; second, in the microscopic properties of all substances; and third, in the complexities of cellular systems that are poorly understood but profoundly significant.

## THE BODY EVALUATES EVERYTHING

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To protect itself against unwanted or harmful changes, the human body must monitor and react to its environment at every instant. With each breath, bite or thought, chemical changes occur at the cellular level. Scientists are now broadening their diagnostic scope by using trained dogs to detect certain cancers<sup>xx</sup> based on evidence showing the disease has its own smell, different from the normal tissue. Researchers in this field of study are using dogs to detect the presence of lung,<sup>xxi,xxii</sup> ovarian<sup>xxiii</sup> and colorectal cancers.<sup>xxiv</sup> This ground-breaking form of analysis reveals that even the smallest changes at the cellular level are measurable if given the right “nose.” Diagnostic methods that can find pathologies without being invasive would be a blessing to patients and their wallets. But it gets even more amazing.

Most of the “thinking” done by the body is the unconscious. Even while awake, the unconscious mind monitors 95 percent or more of the total stimulation the body experiences. When the eyes are focused on an object a few feet away, most of what is present in the peripheral vision is unnoticed—it is not processed consciously. It is easy enough to bring the unconscious to the conscious. The simple wave of a hand in the periphery or the passing of a moving object could be enough visual input to cause the mind to shift focus, resulting in a quick head turn to see this new thing. In other words, the whole world is being monitored and evaluated at every instant, but only a small portion actually generates a response. This seems basic enough; however, the true complexity of this process begins to come to light when attempting to estimate just how many processes the body evaluates each second.

Temperature, pressure, light, sound, smells, thoughts, impressions, decisions and voluntary movements are just some of the categories of information under scrutiny within the body. Unconsciously, it evaluates at any living moment every one of the 100 trillion<sup>xxv</sup> cells and their metabolic activity. Every hormone, every step in energy production, digestion, blood sugar management, immune system regulation, thyroid activity, energy creation, pain management, emotional balance and more are under continuous assessment and modification. This is truly fantastic, but true all the same.

Inside a cell there are thousands of protein-based enzymes at work continuously.<sup>xxvi</sup> A conservative approximation for the number of processes underway each second would be tens of thousands. To get an idea of the total number of processes the body must monitor we would need to take this number and multiply it by the total number of cells. The result is in the neighborhood of  $10^{16}$  reactions per second. Putting this number in perspective, there are an estimated  $10^{22}$  atoms in the human body and the same number of stars in the universe. This is an incomprehensible and seemingly limitless amount of information under the body’s governorship.

Accounting for all of this, scientists, for close to a century now, have believed and taught that all the reactions within a cell and then throughout the rest of the body happened as chemicals accidentally contacted each other in the ambiguous cellular open spaces. When this occurred, the theory claimed electrons jumped their orbits, creating new molecules. The whole thing supposedly happened in a *random* but orderly fashion. Just the numerical facts already presented should lead one to question whether a haphazard, “bump-and-switch” physiology is a sufficient explanation for the level of complexity and detail now known to exist. It is not.

The accepted random-chemical explanation for how physiological processes are directed in the human body is wholly insufficient simply because no understood chemical reactions happen fast enough via random contact to sustain life at its current pace and overall rate of response. If accidental chemical reactions were the only explanation for human physiology, the current speed of life would be impossible. Prudence now suggests another explanation: **A whole-body system must exist that is able to assimilate the deluge of ever-present internal and external stimuli and then generate a response to this surge instantaneously.**

## EVERYTHING IS ELECTROMAGNETIC

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Food passed under the nose of a blindfolded man is easily identified by its unique smell. A sample of food placed in the mouth could just as easily be recognized by its unique taste. The point is, an apple never tastes like an orange, and chocolate doesn't taste like a pretzel. Everything has its own unique characteristics because of its constituent components – what it is made of. The five senses are the best known means of classifying substances based on their distinctive characteristics, but there is an even more mysterious method of identification.

Any substance a person can call a solid is made up of atoms, which are then made up of smaller substances called protons, neutrons and electrons. The electrons can travel at close to the speed of light<sup>xxvii</sup> and do so in their orbit around the protons and neutrons located near the center, or nucleus of an atom. Amazingly, the space between the electrons and the nucleus is much greater than the charged particles themselves, by a factor of ten million to one.<sup>xxviii</sup> It is in this area the electrons do their microscopic dance. To get an idea of how this dance is choreographed, if a human dancer, representing an electron, was shrunk to about two feet tall, her dance floor would be the size of the earth. And, she would dance around the entire land surface seven times every second.

This illustration reveals something very important with regards to the physical world. Most of what is considered solid is not really solid at all, but is actually more empty space than material, a whole lot more. Knowing these mathematical facts, it is a wonder the chair can hold the sitter; the cup can hold the coffee; and when the mailman knocks at the door, his hand doesn't pass right on through! It is the powerful electrical and magnetic forces that allow subatomic particles to move certain distances, but no further, giving them the relative-reality of being solid.

If that were not mind-expanding enough, in terms of quantum mechanics, everything in the universe is energy, and energy is either a force or a transport medium for information. Through sight and sound, frequencies are the source of most communication in life. Right now, the eyes detect the words on this page via reflected light. Light, via the electromagnetic spectrum, is the source of most frequencies whether the waves are radio, microwave, infrared, visible, ultraviolet, X-ray or gamma. Nearly all of the electronic communication that takes place on the earth is via radio or television waves.<sup>xxix</sup> Other frequencies also carry information. Sound waves result from vibrations generated through a speaker or when objects collide or just pass by each other, as is the case with air moving along the vocal chords. The idea that frequencies transmit information is a critical concept for the validation of muscle testing with FBA for one very important reason: *all* substances generate and emit frequencies as part of an electromagnetic field.

Producing an electromagnetic field requires two things: an electric charge and motion.<sup>xxx</sup> This is precisely the constitution of all matter - rapidly moving, negatively charged electrons spinning around positively charged protons and uncharged neutrons. As it turns out, electromagnetic fields are not some strange phenomenon, but are instead one of the foundational principles of all substances. So much so, electromagnetic fields are considered one of the four fundamental forces of nature (the others being gravity, the weak nuclear interaction and the strong nuclear interaction).

The electromagnetic field is unique to a substance and is therefore as much of an identifying marker as is its taste or smell. In other words, **the electromagnetic field of a substance is its energetic fingerprint**. Additionally, since electromagnetic fields create frequencies, and frequencies are a principal means of carrying information, then all substances, without interruption, endlessly announce their identity via their unique electromagnetic fields.

The human body behaves according to the laws of nature. And the laws of nature are undergirded by an electromagnetic reality. Therefore, it should be no surprise that the body operates within and as part of an electromagnetic platform. Thankfully, it appears science is now able to demonstrate what has always been present. Advanced technologies have been designed to study the outer universe of space for scientific purposes and the inner universe of the human body for medical purposes.

All matter will either absorb energy or radiate it back through a process called nuclear magnetic resonance (NMR).<sup>xxxix</sup> The resonance of a material, just like its electromagnetic field, is specific to that substance. Many scientific techniques make use of NMR to study molecular physics, crystals and non-crystalline materials through NMR spectroscopy.<sup>xxxix</sup> By directing energy such as specific radio frequencies at the human body or a blood sample and then measuring the resonance that bounces back, scientists have been able to develop technologies which can identify different types of tissues and even the individual components of human blood. Magnetic resonance imaging, or MRI, is a well-known example. Physicians have used it for decades to peer into the human body and “see” the bones and soft tissues.

The NMR LipoProfile,<sup>xxxix</sup> another sophisticated test using the principle of natural resonance, helps determine whether a patient may be at risk for a heart attack by evaluating the 15 specific kinds of lipoprotein subclasses.<sup>xxxix xxxv</sup> These technologies confirm that all substances have a measurable, invisible, energetic specificity, or fingerprint, based upon their unique components; and that these energies are to some degree measurable. But there is much more.

All of civilized society is controlled, arranged and micromanaged by an electromagnetic world which cannot be seen and is poorly understood by its inhabitants. Right now in any urban area there are around 100 million information-packed frequencies passing by and through each resident. These are called electromagnetic frequencies or EMFs. Mobile phones, wireless Internet, satellite signals and radio and television transmissions permeate the space all around, passing through us mostly unnoticed. What is amazing and pertinent to this discussion is that **each of these forms of communication is electromagnetic and invisible and carries mega quantities of information instantaneously over vast distances and through solids; and they do it all with a relatively small power source.**<sup>xxxvi</sup>

A mobile signal for instance, can reach a cell tower several miles away. The world that only 50 years ago needed an office building to house the first computer, which could barely add and subtract, takes all these facts for granted. The irony of technology is, that even with its overwhelming complexity, the more people take it for granted, the less they understand it. The same could be said for the human body.

The toys of everyday life like computers, cell phones and MP3 Players, with all of their amazing capabilities, look merely like a pile of wooden blocks when compared to the complexity of living things. At any given moment, a single human cell is operating at a greater rate of complexity than all of New York City, or if the DNA is considered, perhaps more than the entire world.<sup>xxxvii</sup> The body has more than 100 trillion such cells<sup>xxxviii</sup> all working in harmony for the good of the whole to maintain homeostasis.

Extensive discussion has taken place over whether EMFs are harmful to both animals and humans. Biologists have documented that biological organisms have a high-sensitivity to tiny electrical stimuli. Animals of all sizes use energetic cues to orient themselves geographically during migrations; to locate prey, predators and mates; and to anticipate all sorts of meteorological and geological phenomena such as strong storms, hurricanes, seasonal changes and even earthquakes.<sup>xxxix xl xli</sup> Therefore many biologists worry the ever-increasing levels of EMFs will create confusion for classes of animals that rely on specific energetic stimuli to survive. Others worry that these same EMF levels are disrupting human physiology.

High EMF levels have been a health discussion in this country and around the world for many years. Some researchers and authors believe prolonged EMF exposure can contribute to a range of health issues<sup>xlii</sup> including sleep disorders, depression, ADD, autism, fatigue, bedwetting, nervous disorders and diseases such as leukemia<sup>xliii</sup> and cancer.<sup>xliv</sup>

In rebuttal, many scientists consistently state that EMFs are not harmful unless they are able to heat and radiate tissues, causing ionization. They also believe that weak signals, those much less intense than what occurs normally inside tissues, should have no biological effect.<sup>xlv</sup> Researchers based this logical belief on the reasoning that low levels of stimulation produce small responses and higher levels of stimulation produce higher responses. Surprisingly, this seemingly logical conclusion turns out to be false. **Living systems tend to defy logic. A high percentage of the time weak stimuli produce the largest response, while strong stimuli produce little to no response at all.**<sup>xlvi</sup>

Scientists at the Neuroscience Research Institute examined the evidence and concluded the following information:

*A striking range of biological interactions has been described in experiments where control procedures appear to have been adequately considered...the existence of biological effects of very weak electromagnetic fields suggests an extraordinarily efficient mechanism for detecting these fields and discriminating them from much higher levels of noise. The underlying mechanisms must necessarily involve ever increasing numbers of elements in the sensing system, ordered in particular ways to form a cooperative organization and manifesting similar forms and levels of energy over long distances.*<sup>xlvii</sup>

These discoveries have led to significant research in the realm of electromagnetic fields and have provided the scientific foundation for the practice of muscle testing and many other forms of energy work. Scientists now understand tissues and cells are non-linear, cooperative, coherent and capable of evaluating and responding to very weak stimuli in a weighty manner.<sup>xlviii</sup> These revelations have in

essence proven what alternative medicine practitioners preach and have known for decades. Namely, that the body is able to detect small electromagnetic stimuli and respond to it immediately. One more question remains: exactly how does the body detect electromagnetic fields?

## THE LIVING MATRIX

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In recent years, seasonal affective disorder (SAD) has gained publicity.<sup>xlix</sup> SAD is a condition characterized by depression and lack of motivation in individuals who have gone long periods of time without adequate amounts of sunlight. This occurs most often in people who live in northern regions and experience daylight lasting less than 10 hours.<sup>1</sup> When stimulated by sunlight, or even forms of artificial light, a host of functions ensue, including biorhythm regulation,<sup>li</sup> calcium mobilization<sup>lii</sup> and pineal gland regulation.<sup>liii</sup>

From a health perspective, the consequences of low sunlight levels can be severe and mostly result from a deficiency in vitamin D.<sup>liv</sup> The sun also plays a major role in helping the internal body clock, which aids in the release and use of important hormones such as melatonin and serotonin, which are sleep and mood-supporting hormones, respectively. Though the eyes play a major role, the benefits of the sun are not realized with them exclusively. A blind person will suffer the effects of dark winter days just as much as someone who can see.

Studies with light to improve the body clock have demonstrated that photoreceptors, as they are called, are located throughout the entire surface area of the skin.<sup>lv</sup> Remember, visible light is electromagnetic. Therefore, the presence of photoreceptors demonstrates the body does in fact detect, respond to and depend upon electromagnetic energy, with visible light being just one of many such forms.

All cells have as protection a fatty membrane made up of pairs of phospholipids, which are electrically polarized and arranged in an orderly fashion. This array of similarly polarized structures makes them a potential sensing apparatus, much like a row of radio telescopes that enable astrophysicists to detect extremely weak electromagnetic signals from nebulae thousands of millions of light years away.<sup>lvi</sup> Many of the body's tissues are arranged in like manner. Collagen in connective tissues, myelin around nerves, contractile tissues in muscles, cilium around hair cells, dendrites in the brain, the rods and cone of the eye, the osteon in bone and sensory endings in retina are just some examples.<sup>lvii</sup> In fact, every fleck of the human body contains multiple numbers of varying arrays, each with the ability to evaluate electromagnetic stimuli. Considering the number of arrangements within cellular structures and their potential to interact with electromagnetic stimuli, it seems the body was designed to monitor and respond to its environment not only via the five senses but even more intimately by an omnipresent electromagnetic detection system; what has been called the sixth sense of biology.<sup>lviii</sup> But there is more. Not only can the body detect and react to the outside world through an electromagnetic network, but it monitors and controls its inner workings through another system just as fascinating.

Early electron microscopy reported cells appeared to have a large amount of empty space. It was here that enzymes dissolved amino acids and sugars and the known processes of metabolism took place. For decades physiologists have based their research on this premise—a premise, as it turns out, that was entirely simplistic. As electron microscopes improved, a closer look inside the cell demonstrated the empty space had no empty space. Instead it was filled with filaments, tubes, fibers and trabeculae—collectively called the cytoplasmic matrix, or cytoskeleton.<sup>lix</sup>

This inner cytoskeleton contained and protected the enzymes necessary for chemical processes. What's more, the cytoskeleton is not just isolated within the cell itself but is connected to the outside of the cell via linking molecules called integrins, which pass through the cell membrane and link to an even greater, more diverse network. In other words, every cell in the body is connected to every other cell via a living matrix.

*The living matrix is a continuous and dynamic 'supramolecular' webwork, extending into every nook and cranny of the body: a nuclear matrix within a cellular matrix within a connective tissue matrix. In essence, when you touch a human body, you are touching a continuously interconnected system, composed of virtually all of the molecules in the body linked together in an intricate webwork. The living matrix has no fundamental unit or central aspect, no part that is primary or most basic. The properties of the whole net depend upon the integrated activities of all the components. Effects on one part of the system can and do spread to others.*

*James Oschman, Energy Medicine, The Scientific Basis*

These facts about human design and function are a legitimate foundation for the practice of muscle testing and even many forms of energy work. The traditional medical world itself has for decades now, employed electrical and ultrasound based therapies to increase wound healing<sup>lx</sup> and reduce pain.<sup>lxi</sup> Likewise, researchers have discovered that using technology to balance human biofields by reducing potentially harmful EMFs has led to enhanced performance in athletes and anxiety reduction in those under stress.<sup>lxii</sup>

Given that the world is full of electromagnetic transmissions both natural and man-made; that the character of EMFs allows them to pass through solids, carry incalculable amounts of data and act as the ordinary manifestation of all materials; that with changes in chemistry or physical structure, there will be changes in electrical activity; that the body is able to detect and react to these electromagnetic fingerprints, perhaps even more so than to the other five senses, and does so via an electromagnetic whole-body matrix; that the reactions are often large and significant even though the stimulation may be minute...believing that a substance placed on or near the body might cause a reflex change in the tone of a muscle, may not be such a big leap after all.

## WHY FUNCTIONAL BIO-ANALYSIS?

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Based on the establishment of a feasible theory for manual muscle testing, another question remains: Why bother with it? Why go to the trouble to train practitioners in its use? Why, with the ever-increasing technology to study human function, is it necessary to have a hands-on method of human assessment?

### Reason #1: Functional vs. Pharmaceutical

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Traditional allopathic medicine, the kind people have become accustomed to in the United States, is the most technologically advanced form of medicine in the world. It has achieved a strong foothold for a number of reasons. First of all, medicine can and has done a great deal of good, including eliminating and holding at bay many diseases. This is recognized worldwide. When it becomes a matter of life and death, people will leave their home country and travel to the United States to receive the best modern medicine can offer. In addition, today's medicine is easy for the patient. The ideas of taking a pill to eliminate symptoms and of lying asleep on a table and then waking up better are very appealing. There is little or no effort involved.

Furthermore, medicine is exciting, even glamorous. Just think, any day now there may be a medical breakthrough or cure for one of the world's most heinous diseases. Imagine all the scientists in all the major universities around the world peering through their microscopes, testing new compounds and making new discoveries. No wonder society so reveres medical doctors. Consider all the Hollywood celebrities raising money to find a cure for this or that disease. Participation in the funding of scientific research allows the public to be part of the movement to find a cure. These efforts are gratifying and in many cases prove to be fruitful.

Next, insurance pays for traditional medicine. Despite what has been proclaimed, most people have some form of insurance coverage through work, a spouse, Medicare or Medicaid. Access to insurance is often a double edged sword. Having the bills paid for a catastrophic illness or injury is certainly a good thing. However, expecting coverage for even the most minor issues and receiving that coverage at little or no cost, has resulted in a population less proactive with their health. Promoting a symptom-minded, rather than prevention-minded perspective has been a good way to keep people dependent on traditional medical care. Unfortunately, this same approach guarantees a culture ignorant of basic human function and maintenance, which in the long-term will mean more disease with even greater costs.

Finally, there are many individuals, including those who practice complimentary medicine, who have benefited from surgical "miracles." When appropriately practiced, medicine can accomplish great things like saving a mother and child from complications during pregnancy. FBA practitioners are in no way interested in replacing medicine. Instead, they hope to improve and enhance what is already in place.

One way to begin building the symbiotic relationship is by defining the scope of both traditional and complementary medicine. Understanding the capacity of each would be a great help for patients

when considering which type of doctor to see for their given ailment. The definitions could establish a clear boundary, demarcating the strengths and weaknesses of each approach. For traditional medicine, many would argue, a weakness would include the area of functional illness.

Currently in our society there is an epidemic of functional imbalances that, if left untreated, will become recognizable diseases. Diabetes, heart disease, stroke and cancer, which account for most of the natural causes of death,<sup>lxiii</sup> all had their start as functional problems that were potentially 100 percent preventable.

It is common for people to describe significant symptoms to their doctor only to then be dismissed because diagnostic tests failed to find anything. The reason for the failure rests on the design of the tests, the purpose of which is to detect disease. Symptoms are often present without a disease. The problem is functional not pathological. Remember, a functional illness is one in which a disruption in any of the body's systems occurs without the presence of a disease. In other words, the body, for whatever reason, is not functioning to its fullest potential and is therefore expending extra nutritional resources in order to maintain homeostasis.

Despite its ability to manage functional illness as demonstrated by its persistent growth, most medical doctors still consider complementary medicine a farce or scam perpetuated on a gullible society. This visceral response is becoming more and more unwarranted, but is not entirely unexpected. No MD wants to go through eight or more years of graduate school, sacrifices a social life and perhaps a family, and accumulates hundreds of thousands of dollars of debt to have people tell them their line of thinking and treatment methods are incomplete or perhaps detrimental. The high level of commitment a person dedicates to become a medical doctor guarantees he will be vested: a full-fledged partner in a disease-care system ironically called "healthcare," which results in limited treatment options (drugs and/or surgery) and too often produces arrogant doctors who see the disease model as the only valid approach.

In the disease model, all resources are devoted to the detection and elimination of a definable disease. This may sound good at first. However, if the goal is health, or not getting a disease in the first place, then the philosophy and practice of allopathic medicine is insufficient and limited. If a disease must first be present, by definition, it must mean a person lost their health somewhere along the way. Conversely, **a philosophy of prevention is one that applies resources toward the correction of early-stage imbalances rather than late-stage illnesses and desires to correct imbalances with natural measures rather than address illnesses with unnatural medications.**

Patients are culpable as well, having been willing participants in the generations-long philosophy of pharmaceutical medicine. With hardly a second glance, the masses discarded the ancient wisdom of health and wellness for a get-better-quick-with-a-pill approach and never looked back. In the end their hasty decision has turned out to be one of the most dangerous, wasteful and expensive methods for maintaining health, managing illness and fighting disease.

In the United States, considering all causes of death, medical doctors have the third highest chance of killing someone. Here is the breakdown according to the Journal of the American Medical Association:<sup>lxiv</sup>

- 12,000 deaths annually from unnecessary surgery.
- 7,000 deaths annually from medication errors.
- 20,000 deaths annually from other errors in hospitals.
- 80,000 deaths annually from nosocomial infections (infections acquired in a hospital).
- 106,000 deaths annually from non-error, adverse effects of medications.

“These total to 225,000 deaths per year from iatrogenic causes [resulting from doctors].” These estimates are for deaths only and do not include other adverse effects such as those associated with disability or discomfort.

The article went on to estimate that between 4 and 18 percent of hospital patients experienced adverse effects resulting in the following statistics:

- 116 million extra patient visits.
- 77 million extra prescriptions.
- 17 million emergency department visits.
- 8 million hospitalizations.
- 3 million long-term admissions.
- \$77 billion in extra costs.

And this is what so many are fussing about in Congress? Access to a system that has a higher chance of killing a person than diabetes, Alzheimer’s, pneumonia and influenza combined?

Japan ranks second only to the United States in the number of advanced diagnostic equipment units, like MRIs and CTs. However, the country ranks highest on health, whereas the United States ranks among the lowest. This seems ironic given the medical technology in the United States is unsurpassed. How then can the U.S. rank so low on health? The author explains this by noting that American patients diagnosed with an illness are hospitalized, whereas in Japan the common practice is to have the family members provide the amenities of hospital care in the patient’s home.

Research has yet to determine all the reasons why home care is statistically better than hospital care. Is it the personal attention? The kindness of family members? The food? The emotional comfort? The reduced risk of infection? Or, some combination? What is clear is that to avoid becoming a statistic like those mentioned above, the best thing to do is to avoid the hospital. And the best way to do that is by avoiding disease. This is what complementary medicine does best; it helps millions around the world recover from the many forms of functional illness and, even in some cases, cancer.<sup>lxv lxvi</sup> Many are beginning to agree with this assessment, which is the reason why complementary medicine has

grown robustly year after year. Despite the fact insurance does not cover most complementary care, patients have decided to pay approximately \$40 billion out-of-pocket each year. This expensive fact has not gone unnoticed by the traditional medical community.

Rather than offering recognition and acceptance of complementary care, the medical establishment has chosen acquisition and absorption. For example, the evening news aired a special "Health Report" describing an electronic device worn on the wrist to decrease the nausea experienced by cancer patients. The reporter went into great detail explaining how the device worked, touting the wonderful potential benefits. Little did she know it was stimulating a point on an acupuncture meridian well-known for reducing the symptom of nausea. Unfortunately, she didn't use any acupuncture terminology or give the practice credit. To control nausea, acupuncture patients have used similar non-electronic wristbands for years at a cost of around \$5.00. This device sold for \$150.00.

As a result of demand by satisfied patients, traditional medicine has reluctantly "accepted" some forms of complementary treatment for specific conditions: acupuncture for pain, chiropractic for lower back problems and massage therapy for stress. It is the hope of some practitioners that one day FBA will be among the techniques on the accepted list.

Prior to allopathic doctors extending this olive branch, the only explanation given for treatments that worked but which were not pharmaceutically based was the placebo effect. In other words, the patient so believed he would get better that he often did, through a mysterious process in his own mind. Though the placebo effect is a real phenomenon, it is inadequate as the sole explanation for all the benefits achieved through complementary health care. Interestingly, since complementary health care providers are often the last of many doctors a patient visits for the same condition, doesn't it seem strange the placebo effect took so long to happen? Or, put another way, why didn't the placebo effect occur at the time the medical treatments were given instead of waiting until a complementary treatment was performed?

The fact is standard western medicine is unable to meet the demands of the ever-increasing functional and chronic illnesses. And how could it? The model of allopathic medicine is to prescribe a drug for a given ailment. Drugs never fix problems; they only force certain reactions to happen at the expense of others, which will then lead to unintended consequences. The role of a drug is to block, inhibit, or down regulate a given biochemical. This approach may have an impact, but it is in no way holistic and cannot bring about homeostasis.

Side effects from medications often require management from a second, third or fourth drug. Pharmaceutical intervention is appropriate in life-threatening situations when the body can no longer help itself and would soon perish. However, these same life-saving drugs, when used for nonlife-threatening illnesses, will make matters much worse, increasing the probability of future chronic illness to a near certainty. This is the current situation for most medicated people.

Where allopathic medicine has reached into the area of prevention, it has often failed. There are no drugs to prevent cancer, only those that attempt to treat it. In fact cancer rates continue to rise. Over

the next 20 years, doctors expect the number of new cancer cases diagnosed annually in the United States to increase by 45 percent, from 1.6 million in 2010 to 2.3 million in 2030.<sup>lxvii</sup> There are also no drugs that can prevent heart disease or diabetes. The incidence of the top-ten killers has also increased in recent years with diabetes topping out at 72,000 deaths annually and heart disease reaching a whopping 630,000.<sup>lxviii</sup>

Additionally, drugs are riddled with side effects, including the cholesterol-lowering statin drugs, prescribed for preventative measures.<sup>lxix</sup> These drugs are very good at lowering cholesterol, but fail to reduce the incidence of heart attacks in those taking them, the purpose for which it was prescribed.<sup>lxx</sup> If all medical science allows for is the use of synthetic medications for the correction of a natural process, then there is little hope for long-term wellness and vitality via the medical methods. What may work for a temporary ailment or infection will not work with illness and disease, especially when the two are often clustered and interconnected. This is the realm of functional medicine, the area where Functional Bio-Analysis can and does excel.

## Reason #2: Finding What Technology Can't

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When it comes to functional imbalances, diagnostic tests often fall short. A blood test can determine the level of a given hormone, but can it tell if the body is synthesizing, utilizing and detoxifying the hormone properly? An MRI can reveal an over-worked and enlarged liver, but can it reveal the chemicals ingested in everyday life that the liver is failing to break down? A glucose tolerance test can determine the body is not properly processing sugar, but can it make known which sugar-balancing hormone and which missing minerals are responsible?

The more people learn about functional imbalances, the more researchers realize such imbalances are clustered, multifaceted states. That is, different imbalances are all present at the same time, leaving the body in a seemingly confused and compensatory pattern. Not surprisingly, doctors can't always find the answers they need to circumnavigate the biochemical puzzle in blood, saliva or urine tests. Those two-dimensional snapshots, although extremely important and valuable in their own right, are inadequate investigatory tools for the human body's multidimensional tripartite structure.

The good news is functional imbalances are not random, though it may often appear so. There are reasons why things have regressed to the point they have and why things look as they do. Understanding what is taking place and the significance of the disruptions through Functional Bio-Analysis is at present the most efficient means of health restoration.

When an experienced practitioner who knows the strengths and weaknesses of his craft properly performs FBA, it is one of the most precise, accurate and reliable methods of obtaining metabolic and neurological information. And it does so instantly, inexpensively and without harm—a stark contrast to other forms of diagnosis and treatment. In the years to come, the doctor who can discern, detect and direct the body to recovery and wellness and do so inexpensively and without harm will be worth his weight in platinum.

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- <sup>i</sup> Ausubel, Kenny. *When Healing Becomes a Crime*; Rochester, VT: Healing Arts Press, 2000, p. 118
- <sup>ii</sup> Cuthbert S, Rosner A, Technique Summary: Applied Kinesiology: <http://www.chiroaccess.com/Articles/Technique-Summary-Applied-Kinesiology.aspx?id=0000144>
- <sup>iii</sup> What Is AK?: <http://www.icakusa.com>
- <sup>iv</sup> Types of Kinesiology: <http://www.kinesiologyshop.com>
- <sup>v</sup> Schmitt, Walter; <http://www.theuplink.com>
- <sup>vi</sup> Astil-Smith, Chris; <http://www.metabolics.com>
- <sup>vii</sup> Lebowitz, Michael; <http://www.michaellebowitzdc.com>
- <sup>viii</sup> Schmitt, Walter H., Yanuck, Samuel; Expanding the Neurological Examination Using Functional Neurologic Assessment: Part I, The Neurologic Basis of Applied Kinesiology. *International Journal of Neuroscience*, vol 97. Issue 1 & 2. March 1999. pp. 77-108
- <sup>ix</sup> Cuthbert SC, Goodheart GJ Jr., On The Reliability and Validity of Manual Muscle Testing: A Literature Review, *Chiropr Osteopat*. 2007 Mar 6;15(1):4.
- <sup>x</sup> Walther, David; *Applied Kinesiology Synopsis*, 2<sup>nd</sup> edition. Systems DC, 2000, p. 347
- <sup>xi</sup> Reeves & Swenson, Disorders of the Nervous System, [http://www.dartmouth.edu/~dons/part\\_1/chapter\\_8.html#chpt\\_8](http://www.dartmouth.edu/~dons/part_1/chapter_8.html#chpt_8)
- <sup>xii</sup> Monrad-Krohn, G.H., Refsum S.: *The Clinical Examination of the Nervous System*, ed. 12, London, H.K. Lewis & Co., 1964.
- <sup>xiii</sup> DeJong, R.N.: *The Neurologic Examination*, ed. 4. New York, Paul B. Hoeber, Inc., 1958.
- <sup>xiv</sup> Wartenberg, R.: *The Examination of Reflexes: A Simplification*. Chicago, Year book Medical Publishers, 1945.
- <sup>xv</sup> Woolf CJ, Ma Q. Nociceptors—Noxious Stimulus Detectors. *Neuron*. 2007 Aug 2;55(3):353-64. Review. PubMed PMID: 17678850.
- <sup>xvi</sup> K Jensen et al., *The Lancet* Nov 8 1975, p.920
- <sup>xvii</sup> Stephens JA, Reinking RM, Stuart DG (1975) *J Neurophysiology* 38:1217-1231
- <sup>xviii</sup> Miller, Herbert, The Role of Autogenic Inhibition in the Reduction of Muscle Splinting. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2484598/>
- <sup>xix</sup> Sympathetic Outflow Enhances the Stretch Reflex Response in the Relaxed Soleus Muscle in Humans. *J Appl Physiol* 98: 1366-1370, 2005.
- <sup>xx</sup> McCulloch M, Jezierski T, et al. Diagnostic Accuracy of Canine Scent Detection in Early- and Late-Stage Lung and Breast Cancers. *Integr Cancer Ther*. 2006 Mar;5(1):30-9.
- <sup>xxi</sup> Machado RF, Laskowski D, et al. Detection of Lung Cancer by Sensor Array Analyses of Exhaled Breath. *Am J Respir Crit Care Med*. 2005 Jun 1;171(11):1286-91.
- <sup>xxii</sup> Bajtarevic A, Ager C, et al. Noninvasive Detection of Lung Cancer by Analysis of Exhaled Breath. *BMC Cancer*. 2009 Sep 29;9:348.
- <sup>xxiii</sup> Horvath G, Järverud GA, et al. Human Ovarian Carcinomas Detected by Specific Odor. *Integr Cancer Ther*. 2008 Jun;7(2):76-80.
- <sup>xxiv</sup> Sonoda H, Kohnoe S, et al. Colorectal Cancer Screening with Odour Material by Canine Scent Detection. *Gut*. 2011 Jan 31. [Epub ahead of print]
- <sup>xxv</sup> Guyton, Arthur C. & Hall, John E., *Textbook of Medical Physiology*, 11<sup>th</sup> Edition; Saunders Publishing, 2005
- <sup>xxvi</sup> Guyton, Arthur C. *Textbook of Medical Physiology*. W.B. Saunders Co, 8<sup>th</sup> ed. 1991. p. 29
- <sup>xxvii</sup> Electron, Wikipedia.org, [http://en.wikipedia.org/wiki/Electrons#cite\\_note-de\\_broglie-47](http://en.wikipedia.org/wiki/Electrons#cite_note-de_broglie-47)
- <sup>xxviii</sup> Atom, Wikipedia.org, <http://en.wikipedia.org/wiki/Atom>
- <sup>xxix</sup> Electromagnetic Waves, Univ of Waterloo, <http://science.uwaterloo.ca/~cchieh/cact//c120/emwave.html>
- <sup>xxx</sup> Becker, Richard. *Electromagnetic Fields and Interactions*; Blaisdell Publishing, 1982, p. 59
- <sup>xxxi</sup> Edwards, J.C. "Principles of NMR." *Process NMR Associates*: <http://www.process-nmr.com/pdfs/NMR%20Overview.pdf>. Retrieved 2009-02-23.
- <sup>xxxii</sup> Keeler, James. *Understanding NMR Spectroscopy*: <http://www-keeler.ch.cam.ac.uk/lectures/Irvine/chapter2.pdf>.

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- <sup>xxxiii</sup> Choices in Testing for Complete Cardiovascular Care, [http://www.labcorp.com/pdf/Cardiovascular\\_flyer\\_L4719\\_0407\\_1.pdf](http://www.labcorp.com/pdf/Cardiovascular_flyer_L4719_0407_1.pdf)
- <sup>xxxiv</sup> Otvos JD. Measurement of Lipoprotein Subclass Profiles by Nuclear Magnetic Resonance Spectroscopy. In: Rifai N, Warnick GR, Dominiczak MH, eds. *Handbook of Lipoprotein Testing*. 2<sup>nd</sup> ed. Washington DC: AACC Press; 2000:609-623.
- <sup>xxxv</sup> Otvos J, Jeyarajah E, Bennett D. A Spectroscopic Approach to Lipoprotein Subclass Analysis. *J Clin Ligand Assay*. 1996; 19(3):184-189.
- <sup>xxxvi</sup> Dolphin, Lambert: <http://ldolphin.org/light.html>
- <sup>xxxvii</sup> D'Adamo, Peter J. *Live Right 4 Your Type*, Penguin Putnam Inc. New York, 2001. p. 4
- <sup>xxxviii</sup> Guyton, Arthur C. & Hall, John E., *Textbook of Medical Physiology*, 11<sup>th</sup> Edition; Saunders Publishing, 2005
- <sup>xxxix</sup> Pressman AS, *Electromagnetic Fields and Life*; Plenum Press, New York 1970
- <sup>xl</sup> Dubrov AP, *The Geomagnetic Field and Life: Geomagneticbiology*; Plenum Press, New York, 1978
- <sup>xli</sup> Ho M W, *The Rainbow and the Worm: The Physics of Organism*, 2<sup>nd</sup> ed. World Scientific, River Edge, NJ 1998
- <sup>xlii</sup> Marino, A.A. & Carrubba, S. The Effects of Mobile-Phone Electromagnetic Fields on Brain Electrical <sup>nd</sup> Activity: A Critical Analysis of the Literature. *Med. Biol.* 28:250–274, 2009.
- <sup>xliii</sup> Kheifets L, Shimkhada R. Childhood Leukemia and EMF: Review of the Epidemiologic Evidence. *Bioelectromagnetics*. 2005;Suppl 7:S51-9.
- <sup>xliv</sup> Brainard GC, Kavet R, Kheifets LI. The Relationship Between Electromagnetic Field and Light Exposures to Melatonin and Breast Cancer Risk: A Review of the Relevant Literature. *J Pineal Res.* 1999 Mar;26(2):65-100.
- <sup>xliv</sup> Oschman, James L, *Energy Medicine: The Scientific Basis*, Churchill Livingstone, 2000 p.176
- <sup>xlvi</sup> *Ibid*
- <sup>xlvi</sup> Adey W R, Balwin S M, *Brain Interactions with Weak Electric and Magnetic Fields*; Neurosciences Research Program Bulletin, 1997 15(1):1-129
- <sup>xlvi</sup> Adey W R, *Electromagnetic Fields and the Essence of Living Systems: Modern Radio Science*. Oxford University Press, Oxford 1990 pp. 1-36
- <sup>xlix</sup> Seasonal Affective Disorder, The Mayo Clinic.org, <http://www.mayoclinic.com/health/seasonal-affective-disorder/DS00195>
- <sup>i</sup> Miller AL., *Epidemiology, Etiology, and Natural Treatment of Seasonal Affective Disorder*. *Altern Med Rev.* 2005 Mar;10(1):5-13.
- <sup>ii</sup> Hirota T, Fukada Y., *Resetting Mechanism of Central and Peripheral Circadian Clocks in Mammals*. *Zoolog Sci.* 2004 Apr;21(4):359-68.
- <sup>iii</sup> **Holick MF. Vitamin D: Importance in the Prevention of Cancers, Type 1 Diabetes, Heart Disease, and Osteoporosis. *Am J Clin Nutr.* 2004 Mar;79(3):362-71.**
- <sup>iii</sup> Chowdhury I, Sengupta A, Maitra SK., *Melatonin: Fifty Years of Scientific Journey From the Discovery in Bovine Pineal Gland to Delineation of Functions in Humans*. *Indian J Biochem Biophys.* 2008 Oct;45(5):289-304.
- <sup>liv</sup> Holick MF., *Photosynthesis of Vitamin D in the Skin: Effect of Environmental and Life-style Variables*. *Fed Proc.* 1987 Apr;46(5):1876-82.
- <sup>lv</sup> Campbell SS, Murphy PJ., *Extraocular Circadian Phototransduction in Humans*. *Science.* 1998 Jan 16;279(5349):396-9.
- <sup>lvi</sup> Oschman, James L, *Energy Medicine: The Scientific Basis*, Churchill Livingstone, 2000 p.179-181
- <sup>lvii</sup> *Ibid*
- <sup>lviii</sup> *The Bird's Sixth Sense: How They See Magnetic Fields.*  
<http://blogs.discovermagazine.com/80beats/2009/10/29/the-birds-sixth-sense-how-they-see-magnetic-fields/>
- <sup>lix</sup> Oschman, James L, *Energy Medicine: The Scientific Basis*, Churchill Livingstone, 2000 p.45
- <sup>lx</sup> Busse JW, Bhandari M, Kulkarni AV, Tunks E., *The Effect of Low-intensity Pulsed Ultrasound Therapy on Time to Fracture Healing: A Meta-analysis*. *CMAJ.* 2002 Feb 19;166(4):437-41.
- <sup>lxi</sup> Bedwell C, Dowswell T, Neilson JP, Lavender T., *The use of Transcutaneous Electrical Nerve Stimulation (TENS) for Pain Relief in Labour: A Review of the Evidence*. *Midwifery.* 2010 Feb 17.

---

<sup>lxii</sup> Eichler , David, A. Study of a Subtle Energy Transduction Device on Anxiety Levels of Students in a Public School Setting. *Journal of Alternative & Complementary Medicine: RUBIK/SRT& trade PAPER*, Vol. 8, #6 (pp 823-856)

<sup>lxiii</sup> National Center for Health Statistics, <http://www.cdc.gov/nchs/FASTATS/Icod.htm>

<sup>lxiv</sup> Starfield B, Is US Health Really the Best in the World?, (*JAMA*), July 26th, 2000, vol. 284, No. 4

<sup>lxv</sup> Brodie, Douglas, *Cancer and Common Sense, Combining Science and Nature to Control Cancer*. Winning Publications. White Bear Lake, MN 1997.

<sup>lxvi</sup> Diamond J, Cowden L, Goldberg J, *An Alternative Medicine Definitive Guide to Cancer*. Future Medicine Publishing. Tiburon, CA 1997.

<sup>lxvii</sup> Smith, Ben et al, *Journal of Clinical Oncology*, April 29, 2009; University of Texas M.D. Cancer Center.

<sup>lxviii</sup> National Center for Health Statistics, <http://www.cdc.gov/nchs/FASTATS/Icod.htm>

<sup>lxix</sup> Bottorff MB., *Am J Cardiol*. Statin Safety and Drug Interactions: Clinical Implications. 2006 Apr 17;97(8A):27C-31C.

<sup>lxx</sup> Tirkkonen T, Ryyänen A, Vahlberg T, Irjala K, Klaukka T, Huupponen R, Laine K. Frequency and Clinical Relevance of Drug Interactions with Lovastatin and Simvastatin: An Observational Database Study; *Drug Saf*. 2008;31(3):231-40.