

# **Sympathetic Resonance Technology™ (SRT): Scientific Foundation and Summary of Biological and Clinical Studies**

**A White Paper**

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## **Introduction**

Sympathetic Resonance Technology (SRT) is a novel proprietary technological development that has been shown in various laboratory and clinical trials to produce a host of beneficial effects on humans, cells, and other biological systems. Used in consumer products such as the QLink pendant, which is worn on the body, and the QLink Ally and ClearWave, which is placed in the local environment, SRT involves biophysical principles such as field interactions, information-carrying fields, and resonance. These principles are not well known even to biologists, who typically focus on the biochemical aspects of life. Thus, in this section, a biophysical foundation on information-carrying fields in relation to the dynamics of life is provided. Key scientific terms and concepts that are introduced are as follows: **stressors** and how they lead to **stress** and other health problems; the effects of stress on homeostasis and **homeodynamics**; the **biofield** as proposed regulator of homeodynamics; **electromagnetic pollution** as one type of stressor; the science of **bioelectromagnetics** and beneficial electromagnetic fields used in medicine; a new concept of **bio-information** conveyed by electromagnetic signals; the limitations of classical physics as a foundation for the life sciences; **nonlinear dynamical systems theory** as a model for the dynamical properties of biological systems; and a **field model of life**.

For over a decade, numerous researchers in biology and medicine from countries all over the world have contributed to the research findings on SRT. This paper is a comprehensive compilation of the biological and clinical data from their studies.

### 1. Stressors Cause Stress

The concept of stress in biology and medicine was first conceived by Hans Selye<sup>1</sup>, who began his pioneering research back in the 1930s. Not only does an organism respond to a stressor or health-challenging stimulus with a specific response that is appropriate; it also produces a nonspecific response. For example, if the body temperature is too high,

perspiration is the specific response that serves to cool the body through evaporation, and there are also a host of nonspecific responses which is the stress response. For example, in humans, the stress response includes the typical fight-or-flight response in which adrenalin is released and a cascade of biochemical and physiological events occur. These lead to an increased heart rate, increased blood pressure, reduced immune function, and many other changes at various systemic levels. This nonspecific response to a stressor is the stress response.

Stressors may impact one or more levels of biological organization. There are a host of appropriate biological responses to stressors that enable organisms to counteract them, adapt, and survive. (See Table 1).

**Table 1.** Adaptation of Biological Systems to Stressors

<b>Level of Action of Stressor</b>	<b>Biological Response (examples)</b>
1. Molecular	DNA repair, heat shock response, protein degradation, free radical scavenging
2. Cellular	Cell proliferation, apoptosis
3. Tissue	Regeneration; repair
4. Organ	Modified organ function; detoxification, changes in blood circulation in organ
5. Physiological system	Changes in thermoregulation, immune system, hormonal systems
6. Whole organism	Behavioral adjustments, including avoidance

Humans face innumerable stressors each day. There are mental and emotional as well as physical stressors that provoke the stress response. Physical stressors include all physical challenges to our health and well being, such as temperature extremes, poor nutrition or hydration, extreme physical exertion, lack of restful sleep, toxic substances, air and water pollution, and other forms of pollution such as electromagnetic fields (EMF). Most of us are exposed to multiple stressors on a daily basis, both transient and constant forms. All of these stressors disturb homeostasis, the tendency of the body to maintain a dynamic equilibrium of functional balance.

One of the most aggravating forms of stressors is a transient one, i.e., one that is applied and then removed, especially if this is on-off behavior is repeated, such as in applied pulsed EMF. Therefore, the use of cellular phones and other appliances that are turned on and off are among the most stress-provoking, as it is far easier for an organism to adapt to a stressor that is constant over time.

The resultant stress from stressors upsets normal functioning and disturbs mental and/or physical functions and performance. The “rainbarrel” concept of stress states that the stress response accumulates like drops of water falling into a barrel. Although a certain amount of stress is a normal part of daily life, the cumulative effects of stress add up and can lead to exhaustion, premature aging, poor performance, minor illness, other

disruptions in normal function, and eventually serious health problems. The accumulation of stress, if intense enough or prolonged, will overwhelm the regulatory mechanisms of the body, and analogous to water input overflowing the rainbarrel, may cause system failure, breakdown and physical disease. Thus, either severe acute stress or prolonged chronic stress can cause illness, which further increases stress, thereby aggravating the illness. In this way, stress can become a downward spiral that can move the organism further and further away from health and harmony.

According to the American Stress Institute, a nonprofit organization founded by Hans Selye, 43% of all adults suffer adverse health effects due to stress. An estimated 75 to 90% of all visits to primary care physicians are for stress-related complaints or disorders. Stress has been linked to all leading causes of death, including heart disease, cancer, lung ailments, accidents, and suicides. Stress is responsible for over half of all workdays lost annually due to absenteeism. Stress is implicated in gastro-intestinal, skin, neurological, emotional, cardiovascular, and immune disturbances, ranging from the common cold to arthritis, cancer, and AIDS. About 80% of the health problems in technologically advanced societies are considered stress-related. Thus, stress has become the greatest threat to the health and well being of our civilization<sup>2</sup>.

## 2. Homeostasis and Homeodynamics

The idea of homeostasis originates in the ancient Greek roots of Western medicine. In the 19<sup>th</sup> century, it was further advanced by French physiologist Claude Bernard, who is regarded as the founder of experimental medicine and contributor to many important discoveries in physiology. Finally in the 1950's, the term homeostasis was coined by Walter B. Cannon, an American physiologist, to describe the resistance of the organism to change, the maintenance of a stable internal environment. The organism must maintain its physical and chemical parameters within a certain range to allow proper functioning of its component cells, tissues, organs, and organ systems.

The concept of homeostasis is based on classical physics. It is modeled in terms of feedback cycles similar to the mechanism by which a thermostat regulates temperature by switching a heater on and off. However, it is now recognized that there is no single or ultimate homeostatic balance point in biological systems, and moreover, that they use a variety of other mechanisms besides feedback control to regulate themselves. Moreover, biology has moved beyond classical physics for its foundations. Thus, the concept of homeostasis is limited and is undergoing replacement by a new concept, homeodynamics<sup>3,4</sup>. This new concept arose from the biophysical theory of thermodynamic open systems, self-organization, and nonlinear dynamical systems theory (described subsequently in this introduction), which emerged over the past few decades.

Homeodynamics takes into account the many modes of dynamic behavior exhibited by living processes in an ever-changing lifeline of the organism<sup>5</sup>. The principle of homeodynamics states that physiological and biochemical processes help maintain the internal systems of the body (e.g., blood pressure, temperature, pH, etc.) in dynamic

equilibrium, despite continuous environmental challenges and internal fluctuations in the natural dynamics of life. However, the dynamical range of what is considered optimal health is not a unique balance point, but varies, depending upon the individuality of the organism--its unique biochemistry, history, and biological age. Moreover, homeodynamic life processes exhibit characteristic oscillations or rhythms, and there are a very large number of these in an organism, each with different time characteristics. For example, the flux of various ions across the cell membrane have particular periodicities. Many homeodynamic processes display circadian rhythms.

A critical aspect of homeodynamics is the capacity of living systems to respond creatively to stress. When we are exposed to environmental stressors or mental/emotional challenges, there is a cascade of signal processing along with resulting physical changes in the body that initiate the stress response. The dynamic rebalancing that occurs is always flexible and open to change. Homeodynamics emphasizes the ever-adjusting nature of the processes that maintain life functions, and the fact that once a new stressor is encountered, the organism never returns to its original dynamical state, but establishes a new dynamical balance appropriate to this newly integrated experience. On the other hand, it is also possible for an organism that is structurally sound to engage in a dynamical mode that is a disease state, such as, for example, ventricular fibrillation in the case of the heart, whereby the heart beats very fast but cannot pump blood effectively.

The concept of homeodynamics also maintains that the processes that render dynamic stability proceed simultaneously at various levels of organization, from the molecular level to that of cells, tissues, and organs and the whole being, and with various time scales. Homeodynamic processes are constantly adjusting to all types of information flow and the entire lifeline of the organism. By these means, the organism can integrate a large number of information signals and produce an appropriate biological response. The biofield, described in the next section, is an important regulator of homeodynamics that works from the “top down” to coordinate living functions.

### 3. The Biofield

It has been hypothesized that there is a holistic or global organizing field of the organism<sup>6 7 8 9</sup>. For the human, this is an organizing field within and around the body, which hypothetically regulates the biochemistry and physiology of the body. Indeed, it is acknowledged that the concept of an organizing field in biology evokes shades of vitalism, an old philosophical concept long overthrown in the life sciences, which held that the essence of life was a metaphysical, irreducible life force not amenable to science.

However, the concept of a vital force that is considered essential to life can be found within every indigenous culture. Indigenous systems of medicine such as Ayurveda and Chinese medicine, presently considered alternative in the West, have for millennia maintained concepts of a vital force or subtle energy as a key element in health and wellness. Known as *prana* and *qi*, respectively, in those medical systems, these concepts

are now being reconsidered by science as research on alternative and complementary medicine expands in the West.

In 1994, a panel on alternative and complementary medicine at the U.S. National Institutes of Health created the term “biofield” to address this concept<sup>10</sup>. Certain biological behaviors, such as rapid, global responses of organisms to EMF stimuli and energy medicine interventions such as homeopathy may, in fact, require a biofield concept or other holistic or global property of the organism to explain the mechanism of action. Over the last few years, the concept of the biofield is more prevalent within science and medicine. The term “biofield” has already been accepted by the US National Library of Medicine as a medical subject heading search term. Furthermore, in 1999, the National Center for Complementary and Alternative Medicine at the US National Institutes of Health issued a Request for Application (RFA) for grant proposals dealing with biofield therapies and other subtle energy interactions in health and healing<sup>11</sup>.

The present concept of the biofield as a proposed endogenous, complex organizing field of the organism rests on scientific principles of bioelectromagnetics. The biofield is a complex dynamic field resulting from the superposition of component fields of the organism: the oscillations of the homeodynamic life processes and of the EMF contributed by each electrically charged, moving constituent of the organism (ion, molecule, cell, tissue, etc.). The resulting biofield may be conceived of as a complex dynamic standing wave both inside and enveloping the organism. This field is hypothesized to regulate homeodynamic life processes. It orchestrates the activity of the components of the organism, much like a conductor regulates the musicians playing a symphony. In this case, however, the conductor and the symphony are one and the same, because life is a self-organizing system. The body constituents and their interactions give rise to the biofield; and the biofield in turn directs the functions of the body constituents.

Experiments on regeneration in animals support the concept of the biofield in part as an endogenous electric field that informs the organism and orchestrates the regeneration process. For example, salamanders, which have the capacity to regenerate whole limbs, show a particular temporal pattern in the electric field at the limb stump following amputation, whereas frogs, which do not spontaneously regenerate limbs, do not<sup>12</sup>.

Evidence from studies on energy medicine modalities suggests that the human biofield may also be related to the system of acupuncture points and meridians. An example is the following: when a homeopathic substance that is the appropriate remedy for a patient is brought near the body of the patient, the electrical conductivity of patient’s acupuncture points shift immediately and dramatically<sup>13</sup>. Another example is the vascular autonomic signal (VAS response). When an allergen is placed near the patient’s ear, rich in acupuncture points, the substance emits resonant frequencies that inform the subject’s biofield of this stressor, and this leads to a change in tension of the peripheral artery smooth muscle that can be measured by monitoring the brachial artery pulse<sup>14</sup>. The acupuncture system has not been elucidated by conventional science concepts. Nor have other types of energy medicine modalities, such as homeopathy and healer interventions, been explained.

Some of the findings on energy medicine interventions challenge accepted conventional notions. It has been speculated that the human biofield, like the acupuncture system, may include features beyond conventional electromagnetics that are even subtler. This suggests that the human biofield may have elements that go beyond conventional concepts of space-time and require multi-dimensional geometry or other novel concepts to fully encompass them.

The biofield is a useful construct and offers a unifying hypothesis to explain the interaction of objects or fields with the organism. All objects exhibit an EMF signature of resonant frequencies that theoretically interact with the organism's biofield, the first step in mediating a biological response. The SRT technology will be considered from this viewpoint in this paper.

In sections 4, 5, and 6, the role of EMF is developed.

#### 4. Electromagnetic (EM) Pollution as a Type of Stressor

EM pollution is a type of invisible stressor that most people cannot directly sense, but which have a wide variety of effects on the body. Recall that EMF fall into two categories. There is the strongly ionizing EMF such as ultraviolet light and x-rays, well known to cause physical damage in biological tissues. For a long time, however, the exposure to nonionizing EMF was not considered damaging or stressful, except at high intensities where it might heat or cook tissue. New discoveries in recent decades have challenged that view. Through epidemiological as well as laboratory studies on numerous organisms including humans, it is now established that extremely low levels of nonionizing EMF are also stressors for biological systems and cause a variety of biological effects in them. For example, ambient EMF stressors have been shown to produce the following: (1) altered calcium ion flux in many cell types including brain and heart<sup>15</sup>; (2) reduced melatonin in animals and humans<sup>16</sup>; (3) effects on animal embryogenesis and development<sup>17</sup>; and (4) effects on human performance and psychophysiology<sup>18</sup>. The effects of nonionizing EMF ranging from extremely low frequency to radio frequency, microwave, radar and other broadcast bands produce a variety of biological effects in humans and other biological systems<sup>19</sup>, depending upon many parameters such as the field configuration and exposure pattern. These discoveries concerning the biological effects of extremely low level nonionizing EMF are the cornerstone of modern bioelectromagnetic research<sup>20 21</sup>.

Humans have been found in double-blind trials<sup>22</sup> to exhibit a range of responses to low-level EMF stressors, including profound symptoms such as spastic muscle groups, greatly weakened muscle groups in particular regions of the body. In addition, there are a host of symptoms such as headaches, fatigue, and other complaints associated with exposure to low level ambient EMF generated from computers and other typical office equipment, fluorescent lighting, and home appliances. Low level nonionizing EMF stressors have been shown to induce many different effects on cells, animals, and humans, including

changes in animal and human behavior, changes in the excitability of nerves, altered neurotransmitter and neurohormone levels, reproductive and developmental changes, altered gene expression, changes in membrane transport of nutrients and ions, changes in cell growth rate, and the disruption of biological rhythms, among other effects<sup>23</sup>.

## 5. The Role of Beneficial Electromagnetic Fields

Not all EMF are harmful to life. Some are neutral. Others have been found to produce beneficial effects. Indeed, there are certain specific EMF that produce highly specific biological responses. In relation to that, life evolved on earth in the presence of specific natural EMF, including the earth's magnetic field as modulated by solar and lunar activities. It has been demonstrated that some of these natural frequencies associated with earth's Schumann resonance<sup>24</sup>, ranging from about 7 to 10 Hz, produce beneficial effects on many organisms, including humans, even at extremely low intensities. Because there are many natural frequencies produced by the brain and heart, external fields consisting of these same frequencies when applied to the body can cause entrainment and a host of other changes including physiological, psychological, and behavioral changes. For example, brain waves at 8 to 10 Hz form the alpha band of EEG, which is associated with relaxation and meditation. When EMF in this frequency range are applied to the brain, it entrains and moves into a corresponding psycho-physiological state of relaxation. Many of the therapeutic signals have been identified as natural frequencies of the body, and they are typically in the ELF (extremely low frequency) range less than 100 Hz. Siskin and Walker have reviewed the healing effects of specific frequency windows<sup>25</sup>, and some of them are as follows: 2 Hz, nerve regeneration; 10 Hz, ligament healing; 15, 20, and 72 Hz, stimulation of capillary formation and fibroblast proliferation.

The technology of applying certain beneficial EMF to the body to stimulate the natural healing response, known as bioelectromagnetic medicine, is a new form of therapy in its infancy. Specific EMF have been identified that stimulate therapeutic effects such as osteogenesis, soft tissue regeneration, psychophysiological modulations, and immune system enhancement<sup>26</sup>. One specific application is that extremely low-level (picoTesla) EMF in the ELF range has been applied successfully to treat Parkinson's disease<sup>27</sup>. Another more widely used application is pulsed electromagnetic stimulation at 7 Hz, useful to promote bone tissue regeneration<sup>28</sup>. This noninvasive treatment for bone fractures has been FDA approved for over 20 years. These bioelectromagnetic medical applications are in various states of development, acceptance, and use around the globe.

Medical interventions that involve the therapeutic application of extremely low-level EMF signals may, in fact, be providing EM bio-information (information conveyed by EMF), for example, through resonance or entrainment, which interacts dynamically with the endogenous biofield of the organism. Such interventions that make use of extremely low-level stimuli act as small nudges in accordance with the body's natural dynamics to promote homeodynamic balance. Most of the therapeutic signals used are not pure sinusoidal waves; they are a complex mixture of waves modulated by other frequencies, similar to the modulated signals used in AM and FM radio broadcasting.

## 6. Extended Concept of Information in Biology and Medicine

The concept of information in conventional biology, based on biochemistry, is information conveyed by various biomolecules (such as DNA, RNA, hormones, receptors, etc.). However, that concept needs to be extended to the biophysical model of life expounded here based on field interactions. That is, energy in the form of extremely low-level EMF can also convey information. That information is encoded in the dynamic wave train of an EMF.

One central feature of all energy medicine modalities is that they involve extremely low levels of energy, even negligible amounts, yet they are capable of producing dramatic shifts in biological response. A new concept of information-containing energy has been proposed to underlie the action of all types of energy medicine modalities<sup>29</sup> (acupuncture, homeopathy, healer interventions, and bioelectromagnetic therapies).

As part of biological regulation and maintenance of homeodynamics in the organism, cells and tissues may engage in continuous EMF “whispering”, in which they exchange information. This may be an inherent communication system in the organism, in which the constituents of life serve as both antennas and receivers of information-carrying signals conveyed via cooperative structures and the biofield.

Numerous discoveries in bioelectromagnetics research have demonstrated a surprising fact: that extremely low intensity nonionizing EMF, having even less energy content than physical thermal noise, can produce biological effects<sup>50 31</sup>. At such extremely low levels, applied EMF must be acting informationally rather than energetically to stimulate subtle changes in the dynamics of life functions. This has been called “electromagnetic bio-information.”<sup>32</sup> Although there is no agreed upon mechanism, most of the proposed mechanisms of action lie beyond classical physics, which does not anticipate effects from intensities so low that they are energetically indistinguishable from ambient noise. Mechanisms of action must take into account the fact that organisms are nonlinear systems that are far-from-thermodynamic equilibrium. This is modeled using the theory of nonlinear dynamical systems, described in the next section.

## 7. Nonlinear Dynamical Systems Theory and Life

Biological systems have been shown to be exquisitely sensitive to a quantum range of stimuli such as a single photon, which is impossible to explain using classical physics. Moreover, living systems exhibit other features that challenge classical physics, such as being far-from-equilibrium, exhibiting dynamical self-organization, and showing nonlinear responses to stimuli such as stressors. Nonlinear dynamical systems theory addresses the behavior of such complex systems including these features of living systems. This theory was developed in the 1970s as an interdisciplinary endeavor involving mathematicians, biologists, and engineers.



As described in sections 2 and 3, living systems have many natural oscillating life processes that contribute to the biofield and are homeodynamic. These natural oscillators are not absolutely periodic, but display some irregularity. For example, there is a natural variability in the heartbeat, and it is conceded that this is associated with a healthy heart because it helps the heart maintain normal dynamics despite the onslaught of stressors. There are also many possible modes of behavior for these oscillating systems, as discussed earlier in the section on homeodynamics. Nonlinear dynamical systems theory addresses mathematically the specificity, system trajectory, and range of possible behaviors of each homeodynamic process.

Nonlinear dynamical systems theory is presently accepted as the best theoretical model of the dynamics of life and its global properties. All of the dynamical properties of living systems have been modeled by its systems of differential equations. Features such as the influence of extremely minute stimuli, have been shown in both theory and experiment to change system dynamics, sometimes dramatically. This is especially so when small perturbations act at singular points (areas of spatial-temporal discontinuity) of nonlinear dynamical systems. This is observed, for example, when a dynamically unstable organism is stabilized by a subtle intervention; or, in the opposite case, when an organism experiencing an additional increment of stress undergoes system breakdown and collapse.

Indeed, biological effects from extremely low intensity EMF exhibit many of the dynamical properties predicted by the theory. These include such behaviors as response thresholds, power and frequency windows of response, strange attractors, and hysteresis effects<sup>33</sup>.

When multiple stimuli are presented to an organism, such as applied multiple stressors, the resulting biological response is nonlinear, meaning that the biological response is not the simple sum of the responses to the individual stressors. That is, the organism may respond to multiple stressors with a heightened response that is unpredictably large. In fact, the theory of dynamical systems anticipates how multiple stressors can lead to biological imbalance, breakthrough to a new dynamical solution, or breakdown and disease.

Nonlinear dynamical systems theory provides the mathematical foundations of the biofield and the homeodynamic life processes. It is interesting to note that the mathematical equations are the same at all levels of organization in the organism. In the next section, we return to discuss the field concept in biology.

## 8. The Field Model of Life and Other Models in Biology

There are many ways of describing and modeling the properties of nature—causal, functional, reductive, and holistic accounts all exist. Scientists typically invoke the appropriate model necessary to explain the observations at hand. It must be pointed out, however, that molecular reductionism dominates the scene in biology and medicine.

However, many observations, such as the mechanism of action of certain alternative medicine modalities, challenge the molecular view.

Physics informs us that particle and field interactions are both considered fundamental, and indeed, they are also complementary models of nature, as in the particle-wave dualistic model of light. In this paper, we are considering the field interactions of SRT on living systems, and it is therefore appropriate to invoke a field model of life to explain the observed phenomena. The experimental observations indicate that SRT produces a wide variety of effects on various biological systems. Moreover, SRT apparently acts at many different levels of biological organization, from the molecular level to that of the cell, tissue, organ, and all the way up to the level of human behavior. SRT is, moreover, a very subtle and noninvasive intervention, which, as a device employed by simply placing it nearby the organism, elicits a field response. These facts would be extraordinarily difficult to explain from molecular mechanism. Therefore, a field model of life that deals with global properties of biological systems and its system dynamics is invoked to build a scientific foundation for the interactions of SRT on living systems.

In this model, the components of life, including its biomolecules, nonetheless, do play a role. The rhythmical patterns of activity from the ensemble of constituents give rise to the biofield, the endogenous field of the organism. This is a very complex dynamical field composed of many different frequencies, analogous to a musical symphony that changes with time. As a holistic parameter, the biofield is proposed to regulate cells, tissues, organs, and organ systems homeodynamically. This paper proposes that SRT mediates its effects by interaction with the biofield. This is elaborated in the next section.

## **Theory and Background**

A new biophysical model of life based on its dynamical and field properties is emerging as described above. Life is regarded as a nonlinear dynamical system in which the biofield and flows of information-carrying energy determine its function and stability. Living systems are engaged in constant “conversation” or “signaling” with their constituents and the environment, constantly exchanging information. They are actively responding to this endless information flow by continuously adapting their behavior, by re-orchestrating their self-organizing potential represented in the dynamical biofield. The concept of the self-organizing potential can be extended all the way down through each subsystem to each living cell within an organism that potentially contributes to the self-regulating or homeostatic process. Moreover, life is subject to internal and external fluctuations or stressors that may impact homeodynamic processes and render it unbalanced or in an altered dynamical state, that is, under stress. This view is central to understanding how SRT stabilizes various life functions and processes.

SRT functions homeodynamically to mitigate the stress response, which is nonspecific and undesirable. (See section 1 for definition of stress response). It is thought to interact primarily with the biofield in a passive manner to strengthen and reinforce it. This reinforcement of the biofield strengthens the body’s ability to self-regulate and perform

optimally under the external or internal stressor, optimizing the appropriate specific response to the stressor.

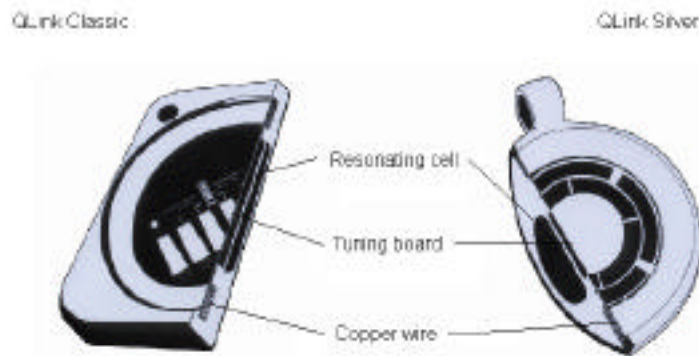
To achieve this, SRT provides information-carrying modulated signals that resonate with component frequencies of the biofield. When conditions of resonance are met, this improves the dynamic stability of the biofield. This biofield strengthening serves to amplify its effects as “conductor of the symphony”, master bioregulator of all of the functional processes in the body that work together homeodynamically. With the biofield thus reinforced in a dynamic steady state, this helps the organism deal with potentially stressful interactions with its environment before they disrupt physiological functions. SRT thus helps maintain the organism in an optimal dynamic state by enhancing the clarity and integrity of the information flux within the nonlinear dynamical system in which the biofield and flows of information-carrying energy determine its function and stability.

As mentioned previously, resonance is an important concept within SRT. The field characteristics of the information-carrying modulated signals of SRT are in part determined by its physical component structure. The structural components are treated using a master field device with proprietary resonant frequencies that modulate their resonance characteristics.

The invention of SRT involves designing a receiver or sympathetic resonator with highly specific resonance characteristics. For all of the SRT devices, specialized crystalline oscillators are employed. The SRT device components, once exposed to the proprietary SRT modulated electromagnetic fields, permanently embody or “store” the resonant frequencies that reinforce the biofield. The input of the biofield to the SRT device thereby results in a highly cooperative resonance effect that strengthens components of the biofield and enhances the life functions of the organism.

Currently, these SRT resonators are manufactured into the QLink Products—QLink Pendant, QLink ALLY, and QLink ClearWave. There are two types of sympathetic resonators, passive and active.

The passive type of sympathetic resonator is used in the QLink Pendant. It consists of three components: a resonating cell, a tuning board and an amplifying coil. (See Figure 1). The main component, the resonating cell, works as a crystalline oscillator. The tuning board reinforces the resonating cell to function in a specific frequency range. It protects the functioning of the resonating cell. The amplifying coil modulates and increases the amplitude of the frequencies within the biofield. This entire process improves the dynamic stability of the biofield.



**Figure 1.** Cross-section of QLink Pendant devices: QLink Classic and Silver.

QLink pendants are worn over the sternum, suspended by a chain or cord, for up to 24 hours a day. It has been observed by many case studies that the QLink pendant worn in this manner over the heart shows maximum protective effect. In relation to the human biofield, the heart is the single most important contributor to the biofield in terms of steady-state rhythms, and it exhibits the largest field strength (ECG) of all the emitters of the body. Moreover, the field emission from the heart can be registered throughout and around the body.

The active type of sympathetic resonator is used in the QLink ALLY and QLink ClearWaves. These are not traditional electrical engineering-type circuit boards, but are designed for their own purpose to provide SRT frequencies and signals. These circuit boards use an actively-powered oscillator to extend the influential range of the instrument. The field ranges are as follows: up to 12.2 meters radially for the Ally and up to 9.1 meters, 12.2 meters, and 15.2 meters radially for the ClearWave 1, ClearWave 2, and ClearWave 3, respectively. The QLink Ally was designed as a portable unit, whereas the ClearWave units are stationary, to be placed within the home or office environment.

The QLink Ally is a portable device operating on a 9V battery that provides the same information-carrying modulated signals that resonate with the biofield as the QLink Pendant, but is generated via an electronically active crystal oscillator in the megahertz range along with other components. The electromagnetic field of the characteristic Hertzian oscillator frequency acts as a carrier waveform for the modulated signals of SRT. (i.e. an RC circuit)

The QLink ClearWave is an AC plug-in digital clock that works on the same principles as the Ally. The three models differ in the numbers of crystal oscillators and signal frequencies. However, the basic working principles are the same.

In summary, it is proposed that SRT technology results in highly cooperative effects on multi-functional systems within the organism. Resonance is achieved between the SRT

device and component frequencies of the biofield. This enhances the self-regulation dynamics of the organism. Homeodynamics of life functions are appropriately optimized, and this results in the organism's enhanced resistance to stress. In the remainder of this paper, the empirical research that demonstrates the biological and clinical evidence for these effects is presented. These studies are organized according to the level of order in biological systems to which the stressor applies: from the molecular level to that of the cell, tissue, organ, organ system, and whole organism.

## **Biological and Clinical Studies**

### **A. Molecular Stressor**

#### **The Effects of Sympathetic Resonance Technology on Stress Tolerance of Human Cell Cultures Exposed to Molecular Stressors**

In this study, the QLink Ally, a portable hand unit containing SRT operated by a 9V electrical battery, was used in the experimental condition. It emits an omnidirectional field over a radius of 12.2 meters. Being only preliminary, this study was not blinded, as the researcher was looking for any effect from a variety of cellular tests using a single culture flask in each experimental condition.

There is a growing body of scientific literature on the effects of EMF on biological systems, including cells, as discussed in the introduction to the previous study. Here, the hypothesis investigated is, does the QLink Ally containing the Sympathetic Resonance Technology convey a protective effect on cells in culture that are challenged with a known chemical stressor, mitomycin C? This hazardous substance is well known for its mechanism of action to bind to DNA and increase the mutation rate and cell death.<sup>34 35 36</sup>  
<sup>37</sup> This study was conducted by Professor Wilhelm Mosgöeller, M.D., of the Institute for Cancer Research at the University of Vienna.

Mitomycin C increases the frequency of strand breaks in cellular DNA, and a high frequency of such breaks can lead to cell death. As the cell dies, its membrane breaks down and certain substances, such as the dye Trypan blue, will enter and stain the cell. Intact, surviving cells resist the stain, so only dead cells are blue. Use of Trypan blue in this manner and counting stained and unstained cells using a microscope is a standard assay for cell viability.

Human fibroblasts from connective tissue and HeLa cells (tumor cells from the epithelium of a cancer patient, Helen Lane, one of the well-established cell lines used worldwide in cell biology research<sup>38</sup>) were the two types of human cells employed in this study. The cells were incubated in culture for 24 hours under normal culture conditions with and without exposure to QLink Ally at a distance of 10 cm. The cells were then stressed by changing the culture medium and adding mitomycin C at a concentration of 2 µgram/ml and incubating another 24 hours, this time without the QLink Ally. Following

this, the cells were incubated with Trypan blue, and the percentage of dead cells was determined using a microscope to count the number of stained and unstained cells.

Four different cultures were measured, to assay four different conditions: (1) Normally growing cells under standard laboratory conditions (No QLink, no mitomycin C); (2) Cells affected by chemical stress (No QLink, mitomycin C); (3) Cells affected by QLink alone (QLink, no mitomycin C); (4) Cells preconditioned with QLink followed by chemical stress (QLink, mitomycin C).

The results on HeLa cells are shown in Table 2.

**Table 2.** Results on Cultured HeLa Cells

Group	1	2	3	4
Q-Link conditioning	No	No	Yes	Yes
Mitomycin C	No	Yes	No	Yes
n evaluated	417	407	410	412
n dead	6	42	4	59
% dead	1.4	10.3	1	14.3
	Compare group		Chi Square	Significance
	1 – 2		26.33	p < 0.0001
	1 – 3		0.3621	n. s.
	2 – 4		2.3646	n. s.

The results on fibroblast cells are shown in Table 3.

**Table 3.** Results on Fibroblasts Cells

Group	1	2	3	4
Q-Link conditioning:	No	No	Yes	Yes
Mitomycin C	No	Yes	No	Yes
n evaluated	409	415	413	422
n dead	8	72	5	47
% dead	2	17.3	1.2	11.1
	Compare group		Chi Squared	Significance
	1 – 2		50.973	p < 0.0001
	1 – 3		0.7097	n. s.
	2 – 4		4.968	p < 0.05

The results show that there is no significant effect of the SRT upon growth in the case of either cell type where no chemical stressor is present. For the HeLa cells, there was a significant difference in the number of dead cells due to the incubation in mitomycin C over the control culture ( $p < 0.0001$ ). No significant difference was observed when QLink conditioning of the HeLa cells was done prior to the chemical stress induced by mitomycin C.

For the fibroblast cultures, there was as anticipated, a significant difference in the number of dead cells due to the incubation in mitomycin C over the control culture ( $p < 0.0001$ ). Moreover, there was a significant difference with the fibroblasts when QLink conditioning of the fibroblast cells was done prior to mitomycin C incubation. The QLink technology significantly reduced the percentage of dead cells from 17.3 to 11.1% ( $p < 0.05$ ).

The conclusions from this preliminary study are as follows. The pre-treatment of cell cultures with Sympathetic Resonance Technology showed a differential effect on tumor cells (epithelial cancer) and normal cells (fibroblast). The normal cells were protected from subsequent chemical stress and associated cell death, whereas the tumor cells were not. This has important implications about alleviating the effects of stressors on human health, because it suggests a protective effect of the QLink at the molecular level. This protection was observed for normal but not cancer cells, but no strong conclusions can be made since this study was only a preliminary, initial investigation.

The possible mechanism of action by which Sympathetic Resonance Technology exerts a protective effect on cells challenged with chemical mutagens is unknown. However, it is speculated the modulated signals of SRT may act directly on DNA as may EMF<sup>39</sup>. These SRT signals may help protect DNA by changing its conformation to prevent or slow down mitomycin C binding, or they may possibly initiate or speed DNA repair mechanisms following the damage due to mitomycin C binding. The observation that cancer cells were not protected by the conditioning signals as were normal cells has implications for the potential future use of SRT as a possible adjunct measure in chemotherapy treatment of cancer. More studies are necessary to evaluate this potential.

## **B. Cellular Stressor**

### **Blind Study on the Effects of Sympathetic Resonance Technology on the Transformation of *Trypanosoma cruzi***

There is a growing body of research that shows that low-level EMF produce effects on all levels of function of biological systems, including the cellular level. The purpose of this study is to measure the effects of the modulated signals of Sympathetic Resonance Technology on growth and differentiation of cultured cells. In this case, a quantitative bioassay was employed known as the *Trypanosoma cruzi* Metacyclogenesis Assay. This organism is an *in vitro* model system for cell growth and differentiation.

*T. cruzi* is a protozoan, a primitive eukaryotic cell that acts as the agent for Chagas' Disease, also known as trypanosomiasis, an infectious disease in humans that is transmitted by certain insects and a primary cause of heart disease in people under the age of 40 in Central and South America. It undergoes metacyclogenesis or conversion from one phase to another, one of which is infectious and the other not. This conversion can be induced and monitored in cell culture. In this study, conversion to the infectious stage was measured in the presence of a Sympathetic Resonance generator and compared to controls. Stuart M. Krassner, Ph.D., a biologist and Chairman of the Department of Biology at the University of California at Irvine with 15 years of experience and research studying the Metacyclogenesis Assay of *T. cruzi*, conducted the study together with university colleagues.<sup>40 41 42</sup>

The experiment was conducted using two prototype experimental units. One was a programmed device with the Sympathetic Resonance Technology, and the other was a physically identical device supplied by Clarus that was not programmed to deliver any SRT modulated signals, which served as a sham control. The experimenters were kept blind as to the identity of the 2 devices until the study was completed and the data analyzed and reported. A neutral third party was present during the decoding and provided written testimony that the data had already been analyzed and reported.

The experimental protocol was as follows. Non-infective *T. cruzi* cells (*in vitro* stage) were cultured in BHI medium (a non-defined growth-permitting medium) at 28-29 °C after gassing with 5% CO<sub>2</sub> to initiate transformation to the infective stage. The cell cultures were then introduced into the incubators with the generator units after gassing. The cell growth, as determined by total cell number, and percent transformation, as determined by the change in cell morphology, were measured twice, at day 4 and day 7 after gassing.

The experimental generator unit, with dimensions 0.3 m x 0.04 m x 0.3 m was inserted into the incubator, whose internal dimensions were approximately 0.56 m x 0.46 m x 0.46 m. Each unit, sham and programmed, was used in a series of three experiments with 4 sample dish culture flasks, each containing  $6 \times 10^7$  *T. cruzi* cells each.

The cell cultures were placed in 4 locations: (1) directly on the generator unit located in the middle shelf; (2) on the shelf above the unit; (3) on the shelf below the unit; and (4) in an adjacent incubator not containing a generator unit. The samples located in the adjacent incubator served as the negative control. A set of 3 cell culture samples was placed in each location. The experiments were repeated three times with the experimental unit and the sham unit to give a sample size of 9 in each case for each location. The number of cells per culture dish was  $6 \times 10^7$ . The culture dishes were exposed to the devices in the incubator for 15 days.

Any confounding parameters, such as ambient EMF, are controlled for in this study, as identical conditions were used for both the experimental cultures and sham control. The experimental set-up has been used for over thousands of samples in research work previously completed by Krassner and colleagues.



The data are the following:

**Table 4.** Results of Average Percent Transformation after 7 days for Unit A – Sham.

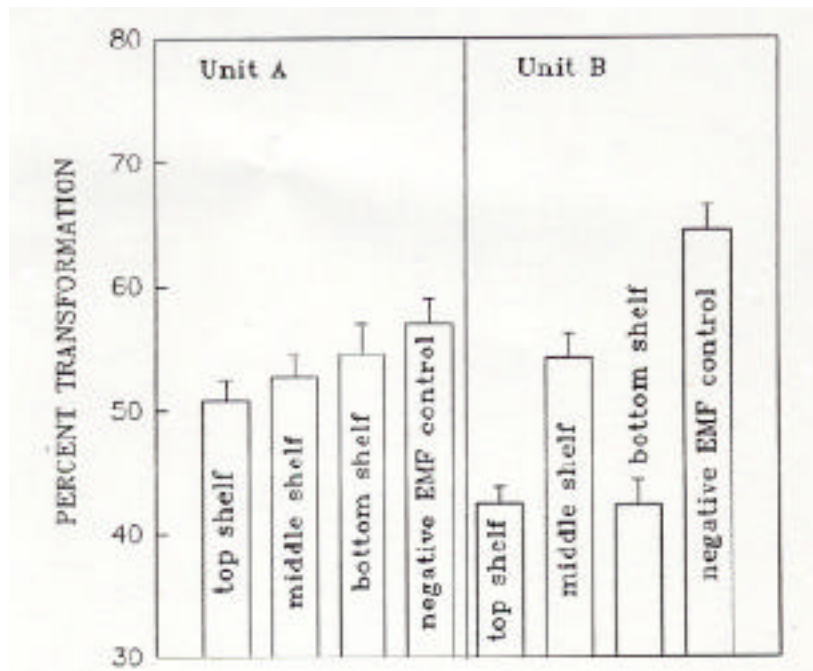
Unit A - Sham Unit				
Sample Location	Top Shelf	Middle Shelf	Bottom Shelf	Negative Control
Mean	50.778	52.667	54.556	57.000
Std Deviation	4.944	5.385	7.316	6.042
Sample Size	9	9	9	9

Paired T-test				
Comparison of Means Against Control				Significant at 0.05 level
	T Stat	P value		
top vs control	-2.5837	0.0324		yes
middle vs control	-1.7333	0.1213		no
bottom vs control	-1.1212	0.2947		no
Comparison by Location				
top vs middle	-8.7065	0.4093		no
top vs bottom	-1.3247	0.2219		no

**Table 5.** Results of Average Percent Transformation after 7 days for Unit B – Active.

Unit B - Active Unit with SRT				
Sample Location	Top Shelf	Middle Shelf	Bottom Shelf	Negative Control
Mean	42.444	54.111	42.333	64.444
Std Deviation	4.003	6.234	6.205	6.146
Sample Size	9	9	9	9

Paired T-test				
Comparison of Means Against Control	T Stat	P value	Significant at 0.05 level	
top vs control	-17.6392	1.09E-07	yes	
middle vs control	-7.9382	4.62E-05	yes	
bottom vs control	-12.1900	1.90E-06	yes	
Comparison by Location				
top vs middle	-7.3379	8.09E-05	yes	
top vs bottom	-7.8872	0.9391	no	



**Figure 2.** Effect of sham Unit A and active Unit B on the *T. cruzi* *in vitro* transformation after 7 days in incubator.

These results (Tables 4 and 5 above) show that metacyclogenesis was induced in cell culture, and the active generator unit with the Sympathetic Resonance Technology inhibited the conversion of the organism to the infectious form in a blinded and controlled study. However, the sham unit did not against the control sample. (See Figure 2 above).

Furthermore, the transformation inhibition appeared to be affected by the position of the cell cultures within the incubator with respect to the generator. (See Table 6 and 7, Figures 3 and 4 below). Those cultures positioned on the shelf above the generator unit or on a shelf below it were greatly inhibited relative to the control. Those sitting directly on top of the generator unit on the middle shelf were inhibited less, and in fact, transformation appeared to be enhanced slightly with the active unit. However, it must be mentioned that incubators are themselves a source of nonuniform EMF emanations and hence a source of electropollution. The EMF emanating from incubators may in fact interact with SRT signals, which would explain the unusual effects observed in the sample incubated directly on top of the generator unit.

**Table 6.** Comparison of Average Value of Percent Transformation by location after 4 days for Active SRT Unit.

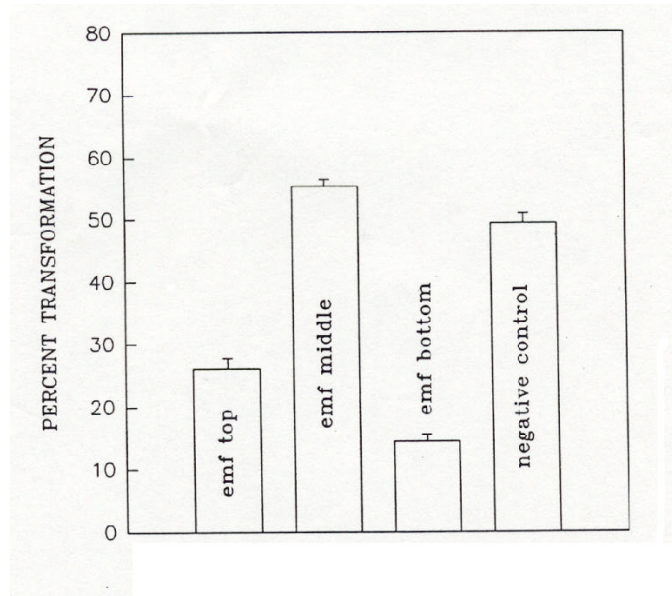
Sample Location	Top Shelf	Middle Shelf	Bottom Shelf	Negative Control
mean	26.111	55.333	14.472	49.333
std dev	8.9156	7.4626	6.6482	6.0671
std err	1.7158	1.1515	1.1080	1.5665
95% Conf	3.5269	2.3256	2.2495	3.3599
99% Conf	4.7681	3.1107	3.0183	4.6637
n	42	42	42	42
sum	705	2324	521	740
max	47	69	32	61
min	13	36	4	38
missing	15	0	6	27

Paired T-test			
Comparison of Means	T Stat	P value	Significant at 0.05 level
Against Control			
top vs control	-4.9302	0.0011	yes
middle vs control	4.3858	0.0006	yes
bottom vs control	-17.2134	<0.00001	yes
Comparison by Location			
top vs middle	19.1385	4.56E-16	yes
top vs bottom	9.4632	6.52E-10	yes
middle vs bottom	39.6863	-7.83E-17	yes

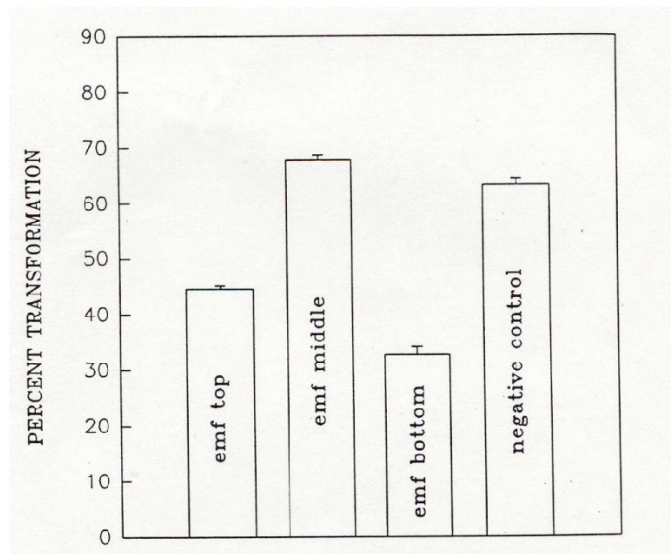
**Table 7.** Comparison of Average Value of Percent Transformation by location after 7 days for Active SRT Unit.

Sample Location	Top Shelf	Middle Shelf	Bottom Shelf	Negative Control
mean	44.600	67.788	32.704	63.250
std dev	2.2928	5.7105	7.4308	4.2453
std err	0.5920	0.9941	1.4301	1.2255
95% Conf	1.2698	2.0249	2.9396	2.6974
99% Conf	1.7625	2.7224	3.9740	3.8066
n	33	33	33	33
sum	669	2237	883	759
max	49	79	59	70
min	40	54	17	55
missing	18	0	6	21

Paired T-test			
Comparison of Means	T Stat	P value	Significant at 0.05 level
Against Control			
top vs control	-4.9302	0.0011	yes
middle vs control	4.3858	0.0006	yes
bottom vs control	-17.2134	<0.00001	yes
Comparison by Location			
top vs middle	19.1385	4.56E-16	yes
top vs bottom	9.4632	6.52E-10	yes
middle vs bottom	39.6863	-7.83E-17	yes



**Figure 3.** Effect of SRT on *T. cruzi* transformation of day 4 cultures with respect to location of source in the incubator



**Figure 4.** Effect of SRT on *T. Cruzii* transformation of day 7 cultures with respect to location in the incubator

The results obtained raise some questions that were further tested with additional controls. To assure that the generator units were not producing a temperature change in the incubator or cell culture media that would affect metacyclogenesis, a control run was performed using bottles containing liquids with the same volumes as the cultures. Thermometers were placed in the incubators. The temperatures were found to be unchanged, suggesting that differential temperature was not a factor in the results obtained.

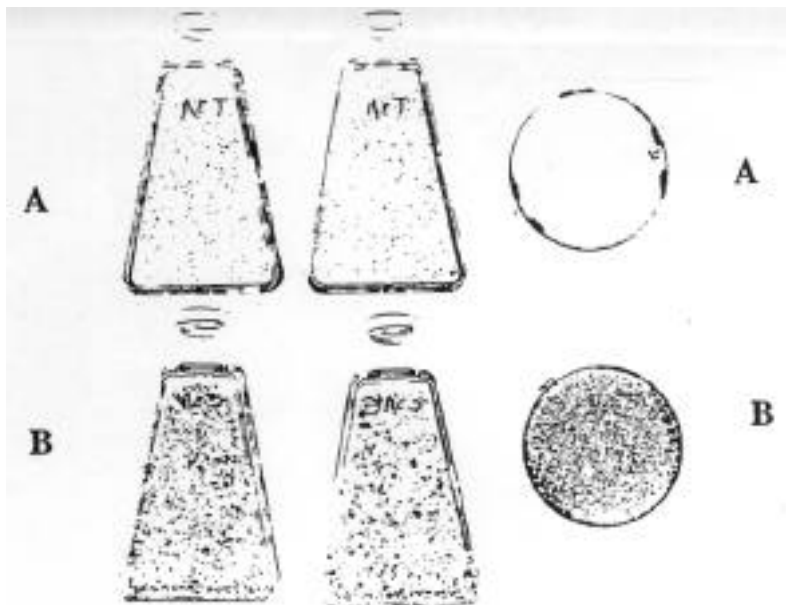
Another control run was conducted to determine if the use of metal shelves inside the incubator resulted in the differential effect observed depending upon the relative position. A Plexiglas shelf was used to replace the top metal shelf, and a run using the active generator unit yielded the same response patterns as was found when all shelves within the incubator were metal. Thus, the presence of metal shelving was not a factor in the different effects observed depending upon position in the incubator.

Two different active generator units with the Sympathetic Resonance Technology were employed in these experiments. It was found that the effect was reproducible from one active generator unit to another (data not shown).

The conclusions from this controlled study are as follows. Sympathetic Resonance Technology produced a demonstrable biological effect at the cellular level in the *T. cruzi* assay, inhibiting its transformation to an infectious form. Moreover, this effect was reproduced in 3 controlled experiments and with different generator units delivering the signals characteristic of SRT.

#### **Preliminary Study on the Effects of Sympathetic Resonance Technology on the cell culture growth of human keratinocytes**

The same laboratory at UCI also performed some preliminary studies on another cell system. They used cultured human keratinocytes to determine the effects of SRT. In 2 experiments conducted by 2 different researchers, the active generator unit placed in the incubator with the cell cultures appeared to significantly inhibit their growth, whereas the control cultures continued to grow normally. (See Figure 4)



**Figure 5.** Growth of human keratinocytes (A) with SRT and (B) without SRT

These cell culture studies on *T. cruzi* and keratinocytes demonstrate that the Sympathetic Resonance Technology affects different types of cultured eukaryotic cells by exerting a field effect on their regulatory mechanisms of growth and differentiation. The following is one possible mechanism of action of SRT on cultured cells. The SRT signals may first interact with the endogenous electromagnetic field of the cell, such as, for example, the cell membrane potential, which then alters the activity of cell receptors, which then initiates a cascade of biochemical signals that affect specific regulatory biochemical processes in the cell controlling growth and differentiation.

### **C. Tissue Stressor**

#### **The Effects of Wearing a QLink on the Blood and Biological Terrain**

##### **I. Live and Dry Blood Analyses with EMF Challenge: 4-subject study**

Live blood analysis<sup>43 44 45 46</sup> involves visual examination of freshly-drawn capillary blood of subjects that is put between a glass cover slip and microscope slide and viewed using an optical microscope with video enhancement. It shows images of the various types of blood cells in their native state and plasma bodies as small as chylomicrons. It is regarded as an important assessment of the biological terrain of the body by holistic health practitioners. The test requires either a dark-field or phase-contrast microscope and a high contrast videocamera attached to it. The magnification with video-enhancement and projection on a monitor ranges up to 20,000X. A remarkably detailed view of live, unstained blood is thus obtained, inaccessible by any other means. The size and shape of the cells, their morphological stability over time, states of agglutination, the presence of cell wall-deficient microbes<sup>47</sup> and the motility of white blood cells are just some of the parameters observed in video footage and microphotographs. Normal healthy fasting blood shows free-floating round-shaped red blood cells interspersed with an occasional white blood cell, and clear plasma with only a few chylomicrons. There are many morphological deviations from the normal state that are associated with nutritional, oxidative, pH, and EMF and other stressors that tend to disrupt the normal biological terrain.

Dry blood analysis, also called the OST or Oxidative Stress Test<sup>48</sup>, is a procedure in which a droplet of freshly drawn capillary blood is left to sit between 20 seconds to 1 minute on the fingertip from which it is drawn, and then pressed onto a glass microscope slide in 8 sequential layers. It is then left uncovered to clot and dry. The resulting fibrin web is examined under a bright-field optical microscope under 10 to 20x magnification, and the patterns noted. This test has been performed in Europe and the US for over 70 years. The accumulation of clinical research data over years shows empirically how the blood pictures relate to oxidative stress and other health issues. In particular, the presence of clear or whitish polymerized protein puddles (PPPs) seen in a thin layer of hard-clotted blood indicate oxidative stress. The number and position of PPPs in the layer, as well as their shape and size are evaluated in the test, as well as other parameters.

Normal healthy blood produces a fibrin web that is continuous and without PPPs, and it appears a uniform pinkish-red.

These blood tests are often used by holistic health practitioners to assess the overall health of the biological terrain and the nutritional status of patients. They are not, however, recognized yet in conventional medicine. There is, nonetheless, a wealth of empirical data that correlates the test results with quantitative blood testing and clinical manifestations<sup>49</sup>. The tests are particularly useful to examine the effects of oxidative and other types of stress on the body at the cellular level, and they are often done in tandem.

In the initial study conducted by Robert O. Young, Ph.D., a microbiologist, 3 hypotheses were tested: (1) How does 8 hours exposure to ambient low-level EMF pollution in the workplace affect the blood morphology of normal healthy human subjects as measured by live and dry blood analyses? (2) Does wearing the QLink during exposure to ambient low-level EMF affect the same blood tests of these subjects? (3) What is the subjective experience of the subjects after wearing the QLink for the first 72 hours?

Both live and dry blood analyses of volunteers under the following experimental conditions were performed: (1) baseline: without known EMF stressors present; (2) EMF challenge: 8 hours' exposure to ambient low-level EMF in the workplace; (3) EMF challenge while wearing a QLink: between 8 and 24 hours' exposure per day for 3 days to low-level ambient EMF stress while knowingly wearing a QLink pendant for 72 hours continuously. Four female subjects, 20 to 30 years old, were the subjects in the study. Neither the subjects nor experimenters were blinded as to the experimental conditions of testing in this study. The subjects lived and worked in London, England, where they had exposure to EMF pollution as computer operators, video editors, and account managers. Moreover, they all reported having stressful occupations with long work hours. All were told not to change anything in their lifestyle during the study except for wearing the QLink pendant. Subjects were not informed of the results of their blood testing during the study. The results are as follows for the 3 experimental conditions as defined above.

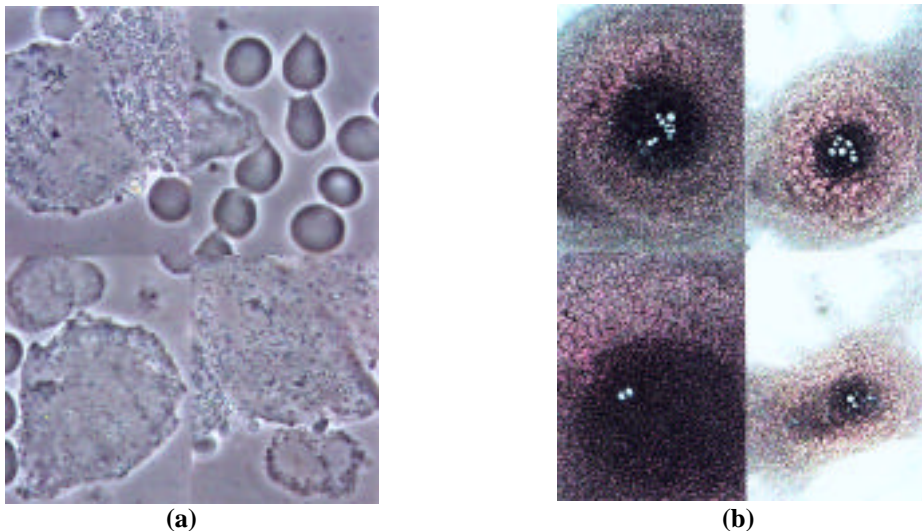
Subject I: (1) Baseline testing showed blood cell disorganization with the presence of cell wall-deficient microbial forms in the live blood test; the OST showed many PPPs throughout indicating abnormal blood clotting profile. (2) The results of EMF challenge showed an increase in the apparent numbers of cell wall-deficient microbes in the live blood test; more PPPs were observed in the OST, as well as a dark center, which has been empirically correlated with bowel congestion. (3) The results of EMF challenge while wearing a QLink showed results that were much improved: a normal live blood profile with fewer microbial forms; the OST revealed a normal pattern. The subject also reported that she was sleeping better, felt less stressed, and did not experience her reoccurring headaches while wearing the QLink.

Subject II: (1) Baseline testing showed blood cell disorganization with some colloid precipitation and crystals in the plasma, as well as some cell wall-deficient microbial forms in the live blood test. The OST showed many PPPs throughout, indicating abnormal clotting associated with cellular disturbance and disorganization, and a dark

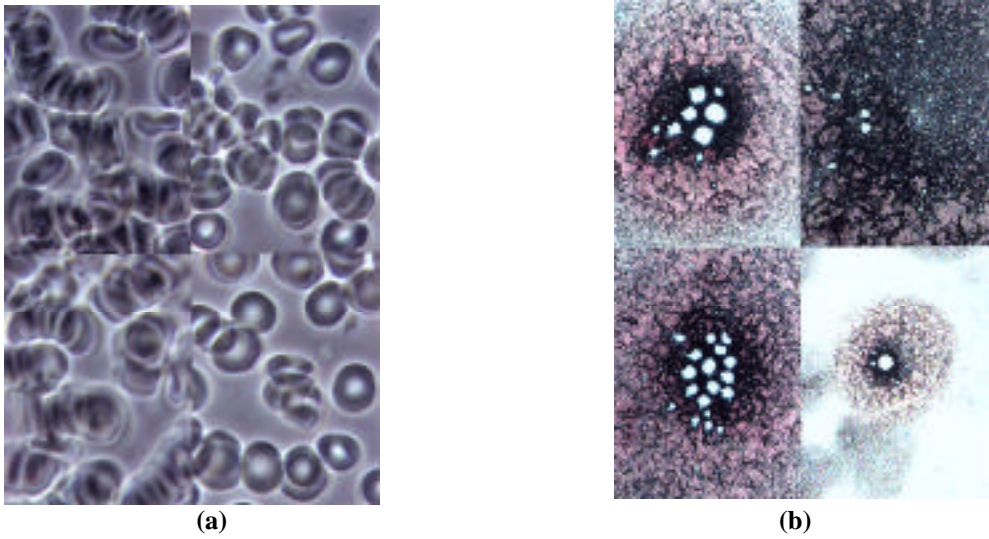


central core that is indicative of bowel congestion. (2) The results of EMF challenge showed an increase in the colloid forms and crystals in the live blood test. The OST revealed larger PPPs scattered throughout and the same dark center associated with bowel congestion. (3) The results of EMF challenge while wearing a QLink showed normal results in the live blood analysis. The OST shows a normal pattern, with only a single PPP observed. The subject also reported feeling less stress and better bowel elimination while wearing the QLink.

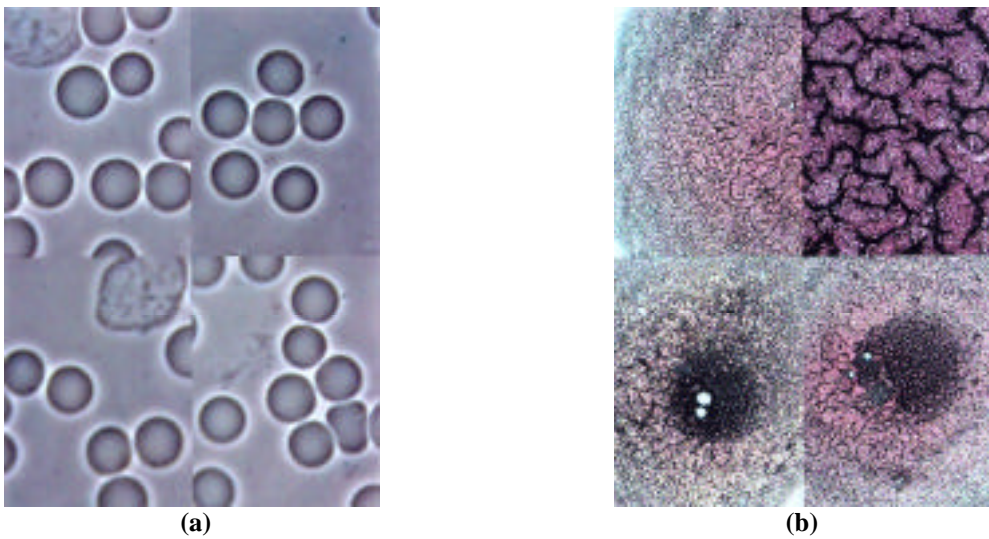
Subject III: (1) Baseline testing showed blood cell disorganization with high levels of precipitated colloids in the live blood test. See Figure 6(a). The OST showed PPPs in the center of the clot, which are associated with cellular disturbance and the possibility of bowel congestion. See Figure 6(b). (2) The results of EMF challenge showed the same types of disturbances with red blood cell aggregation and stacking in the live blood cell test. See Figure 7(a). The OST showed even more PPPs that previously, indicating more severe tissue stress and congestion in the bowel. See Figure 7(b). (3) The results of EMF challenge while wearing a QLink showed little aggregation of red blood cells and a reduction in colloid deposits. See Figure 8(a). The OST showed a normal pattern. See Figure 8(b). The subject also reported feeling less stress, less sugar cravings, and experiencing normal bowel elimination while wearing the QLink.



**Figure 6.** Subject III – (a) Live red blood cell photos before EMF exposure (no QLink). (b) Dried blood cell photos before EMF exposure (no QLink).



**Figure 7.** Subject III – (a) Live red blood cell photos after EMF exposure (no QLink). (b) Dried blood cell photos after EMF exposure (no QLink).



**Figure 8.** Subject III – (a) Live red blood cell photos with EMF exposure (with QLink). (b) Dried blood cell photos with EMF exposure (with QLink).

Subject IV: (1) Baseline testing showed normal red blood cell organization, normal active white blood cells, and a small amount of cell-wall deficient microbial forms as well as crystals. The OST showed many PPPs throughout the clot, indicating cellular disturbance and disorganization throughout the body. (2) The results of EMF challenge showed a number of crenated (wrinkled) red blood cells. The OST showed many PPPs

and a darker center of the blood clot, suggesting bowel congestion. (3) The results of EMF challenge while wearing a QLink showed a normal blood profile in the live blood test, with round and separate red blood cells and actively motile white blood cells, without microbial forms. The OST showed a normal pattern. The subject also reported feeling less stressed and not experiencing digestive sensitivity or bowel congestion while wearing the QLink.

The conclusions drawn from this study are: (1) the stress from 8 hours' exposure to ambient low-level EMF in the workplace can be observed in the blood, and the live and dry blood cell tests record changes such as cellular disorganization and clotting dysfunction; (2) the negative changes seen in blood from exposure to EMF stress can be overcome by wearing the QLink pendant for at least 72 hours; in some cases, the change was so dramatic, that the blood was improved over the control baseline condition; (3) all 4 of the subjects reported experiencing an increase in energy and less stress.

## **II. Controlled Pilot Study Using Live and Dry Blood Analyses: 8-subjects**

A subsequent study was conducted by Robert O. Young, Ph.D., which was a double-blind controlled trial involving 20 volunteers. The hypotheses tested were the following. (1) Does the QLink show an improvement at the level of the biological terrain and blood morphology as monitored via live and dry blood analyses of subjects who were exposed to low-level ambient EMF stress for 72 hours? (2) What do subjects report subjectively about the status of their physical and mental health and well being after wearing the QLink for 72 hours?

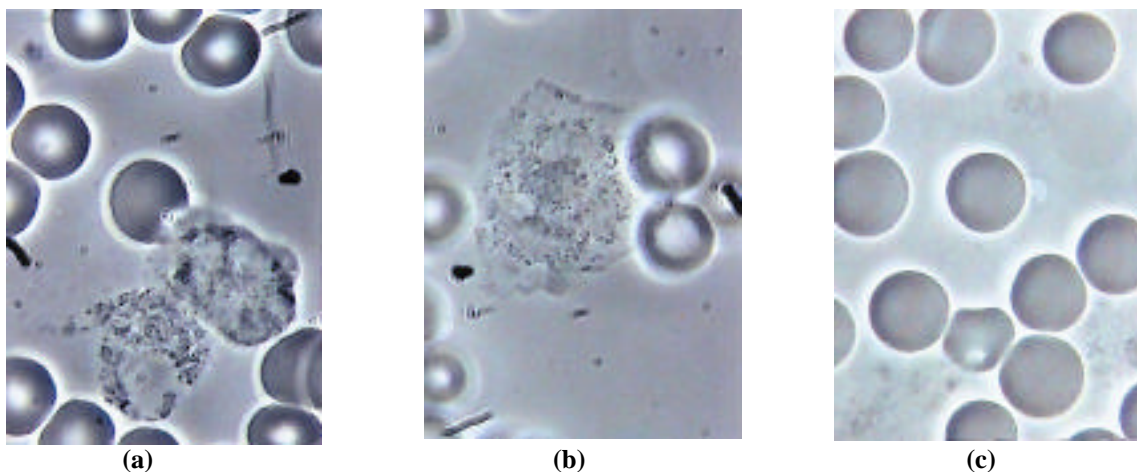
Four of the 20 subjects were disqualified from the beginning and dismissed from the study, because they had prior knowledge of Clarus, and in fact, were already wearing the QLink. The remaining 16 subjects, which consisted of adult males and females ranging in age from 35 to 60, were assigned randomly into 2 groups of 8 each, Group A and Group B. Group A wore a sham device (control) and Group B wore the real QLink, although this was not revealed until the end of the study. Both groups wore QLink-type pendants, but only the pendants of the experimental group, B, had been activated. The sham devices of control group, A, were inactive pendants that were otherwise physically identical to the active QLink pendants. All 16 subjects were exposed to normal everyday EMF pollution associated with cell phones, fluorescent lighting, computers, power lines, and other office and work-related equipment, in addition to other stressors that were held constant during the duration of the study. They were told not to change anything in their lifestyle except for wearing the pendants. In addition, the subjects were exposed to low-level ambient EMF pollution of daily life.

Live blood and dry blood (OST) analyses were conducted on each subject as follows: (1) control condition, before wearing the device; and (2) experimental condition, after wearing the device as a pendant for 3 full days, day and night. Blood was drawn from a finger prick and immediately observed under a video-enhanced optical microscope

assembly as described above. Blood cell images were recorded by microphotography. The results are as follows.

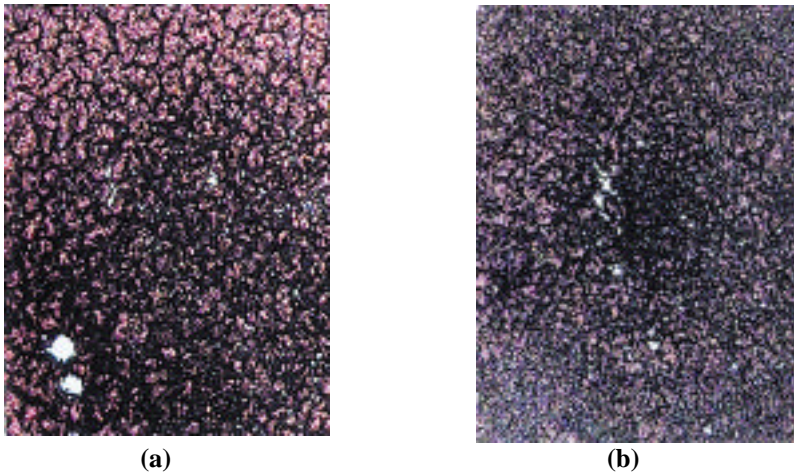
**Group A: Sham QLink**

Subject I: (1) The control live blood test showed some morphological disorganization in the red blood cells and the presence of cell wall-deficient microbial forms. See Figures 9(a) & 9(b). The OST showed PPPs center and off-center in the blood clot associated with cellular disturbance and disorganization. See Figures 10(a) & 10(b). The center of the clot was darker than normal, which is associated with bowel congestion. (2) The experimental live blood test showed no change from the control test. See Figure 9(c). The OST showed a slightly different pattern than the control [See Figures 11(a) & 11(b)], with a greater number of PPPs in the middle of the clot, which is indicative of health challenges in the chest cavity. The other abnormalities observed in the control OST remained the same. The subject remarked that he experienced the same health conditions as before.

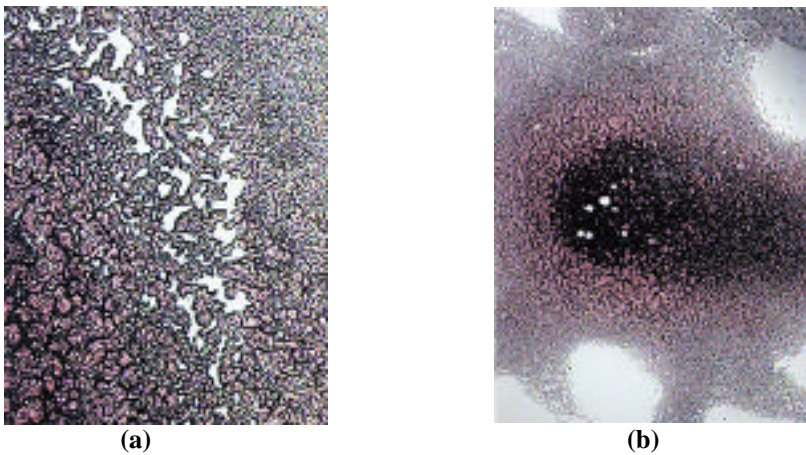


**Figure 9.** Subject I, Group A—Sham QLink device: (a) and (b) Control live red blood cell photos without QLink A. (c) Live red blood cell photo with QLink A. No apparent changes in the live red blood cell photos between the control and QLink A.





**Figure 10.** Subject I, Group A –Sham Device: (a) and (b) Control dried blood cell photos without QLink A.



**Figure 11.** Subject I, Group A –Sham device: (a) and (b) Dried blood cell photos with QLink A after approximately 72 hours.

Subject II: (1) The control live blood test showed stacking of red blood cells. The OST showed a normal pattern, except that the darkened color in the central zone indicated challenges in the center of the body. (2) The experimental live blood test showed stacked red blood cells, and crystals were also present. The OST revealed the same pattern and color abnormality as the control. No changes in health were noted by the subject.

Subject III: (1) The control live blood test showed crystals and stacking of red blood cells. The OST revealed a dark color in the center of the clot, which is indicative of congestion in the center of the body or the bowel in particular. Several PPPs were observed in and near the center, which suggest challenges to the bowel and reproductive system. (2) The experimental live blood test showed the same pattern, with a propensity

for red blood cell stacking and the presence of crystals. The OST revealed the same pattern and color abnormality as the control. The subject indicated that he experienced the same health conditions as before.

Subject IV: (1) The control live blood test showed red blood cell stacking. The OST showed a normal pattern, except for the center, which was dark and had PPPs, indicative of challenges to the bowel and reproductive system. (2) The experimental live blood test was unchanged. The OST was unchanged. The subject indicated that he experienced the same health conditions as before.

Subject V: (1) The control live blood test showed red blood cell stacking and some crystals. The OST showed a normal pattern, except that the center was dark and PPPs were present, suggesting challenges in the bowel and reproductive systems. (2) The experimental live blood test showed the same results as previously. The OST revealed the same results as well. The subject reported the same health challenges as before.

Subject VI: (1) The control live blood test showed irregularly shaped red blood cells, colloid precipitates, and cell wall-deficient microbial forms present. The OST revealed many PPPs throughout the clot, indicating cellular disturbance and disorganization. (2) The experimental live blood test showed no change, nor did the OST. The subject indicated that the aches and pains in her back and legs were still present.

Subject VII: (1) The control live blood test showed stacked red blood cells. The OST revealed a normal healthy profile. (2) The experimental live blood test showed no change, nor did the OST. The subject reported no difference in his mental or bodily function.

Subject VIII: (1) The control live blood test showed stacked red blood cells. The OST showed a normal clot with a dark center and central PPPs, indicating challenges to the bowel and reproductive system. (2) The experimental live blood test showed no change, nor did the OST. The subject reported the same disturbances to digestion as before.

#### Group B: Active QLink

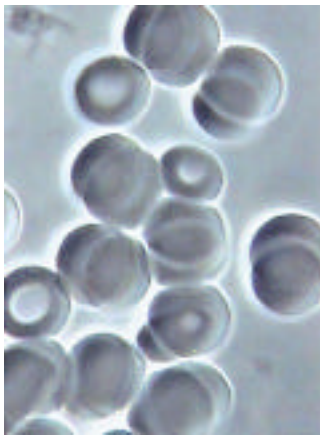
Subject I: (1) The control live blood test showed irregularly shaped red blood cells that suggest iron deficiency. The OST showed many PPPs throughout the clot, indicative of cellular disturbance and disorganization. (2) The experimental live blood test shows normal round red blood cells. The OST shows a normal healthy clotting profile with much less PPPs present. The subject reports an increase in energy while wearing the QLink-B pendant.

Subject II: (1) The control live blood test showed irregularly shaped red blood cells and the presence of crystals and colloid precipitates in the plasma. Some red blood cells appeared to be parasitized with cell wall-deficient microbes, and these were also present in the plasma. The OST revealed many PPPs in excess of 40 microns throughout the clot, indicating cellular disturbance and disorganization. (2) The experimental live blood test showed normal, rounded, free-flowing red blood cells, and no microbial forms present.

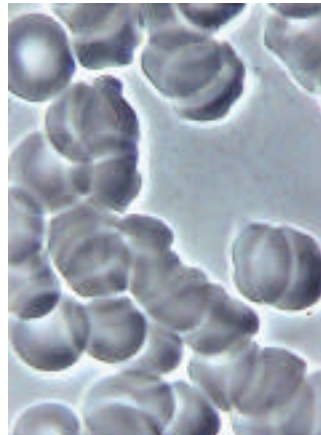
The OST was more normal with small and fewer PPPs. The subject reported an increase in energy, a reduction in light-headedness, and no headaches after wearing the QLink-B.

Subject III: (1) The control live blood test showed irregularly shaped red blood cells, platelet aggregation, cell wall-deficient microbial forms, and some crystals in the plasma. The OST revealed some PPPs in excess of 40 microns throughout the middle of the clot, indicating cellular disturbance and disorganization, which is indicative of health challenges in the middle of the body or chest cavity. (2) The experimental live blood test showed normal, rounded, free-flowing red blood cells, and there was no indication of colloidal or microbial aggregates. The OST showed a normal profile without PPPs. The subject reported that the congestion in his throat and lungs cleared while wearing the QLink-B.

Subject IV: (1) The control live blood test showed irregularly shaped red blood cells with a tendency toward aggregation, and a moderate level of cell wall-deficient microbial forms. [See Figures 12 (a) & (b)] The OST showed several PPPs around 10 microns throughout the center of the clot that is associated with adrenal and psychological stress, as well as one large PPP at the center of the conglomerate, which is associated with a challenge to the male reproductive system. [See Figures 14 (a) & (b)] (2) The experimental live blood test revealed normal rounded red blood cells that appear separate and free-flowing, with no indication of microbial forms. [See Figures 13 (a) & (b)] The OST revealed a normal profile with no PPPs. [See Figures 15 (a) & (b)] The subject indicated that he experienced increased energy and less inflammation while wearing the QLink-B.

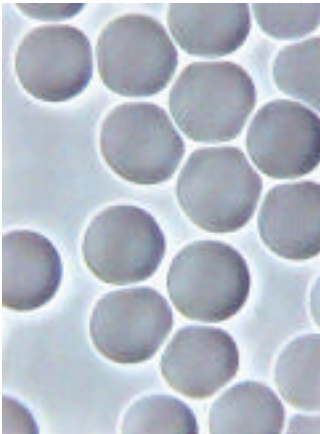


(a)

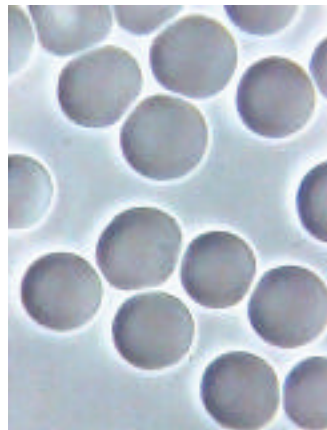


(b)

**Figure 12.** Subject IV, Group B–Active QLink: (a) and (b) Control live red blood cell photos without QLink.

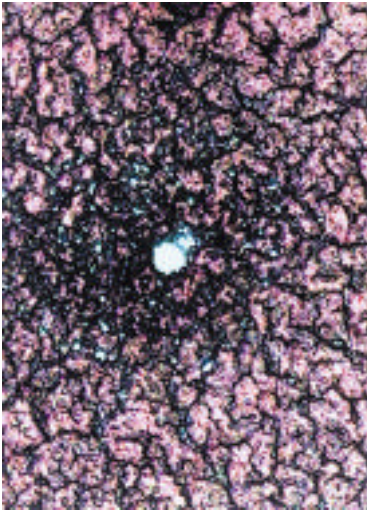


(a)

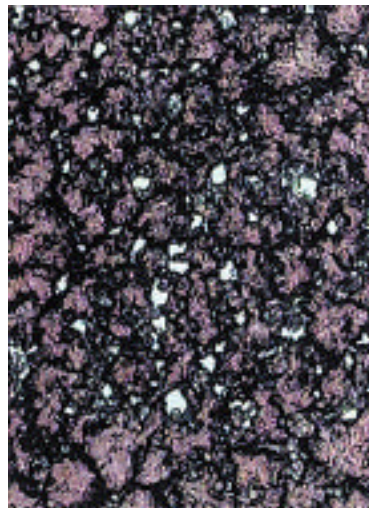


(b)

**Figure 13.** Subject IV, Group B—Active QLink: (a) and (b) Live red blood cell photos with QLink B.



(a)



(b)

**Figure 14.** Subject IV, Group B—Active QLink: (a) and (b) Control dried blood cell photos without QLink B.





(a)



(b)

**Figure 15.** Subject IV, Group B—Active QLink: (a) and (b) Dried blood cell photos with QLink B.

Subject V: (1) The control live blood test showed irregularly shaped RBCs and some cell wall-deficient microbial forms in the plasma. The OST revealed a single 30-micron PPP just off center of the clot, which is associated with a challenge in the pancreas, liver, and/or kidneys. (2) The experimental live blood test showed normal rounded red blood cells that appeared separate and free-flowing, with no indication of cell wall-deficient microbial forms. The OST revealed a normal profile, and the large central PPP had reduced to 10 microns. The subject reported that he felt no physical or psychological difference while wearing the QLink-B.

Subject VI: (1) The control live blood test showed irregularly shaped red blood cells with a tendency to aggregate and stack, as well as a moderate level of cell wall-deficient microbial forms and colloidal precipitates in the plasma. The OST revealed a substantial number of PPPs ranging from 10 – 40 microns in the center of the clot, indicative of adrenal and psychological stress, in addition to 2 large PPPs just off center that are suggestive of challenges in the pancreas, liver, and/or kidneys. (2) The experimental live blood test showed normal rounded red blood cells that appear separate and free-flowing, and no indication of colloidal matter or microbial forms in the plasma. The OST revealed a normal profile, with much fewer and smaller PPPs. The subject reported increased energy and less sugar cravings while wearing the QLink-B.

Subject VII: (1) The control live blood test showed irregularly shaped red blood cells with a rouleau or stacking condition, and a moderate level of cell wall-deficient microbial forms in the plasma. The OST revealed PPPs throughout the central zone of the clot, indicative of adrenal stress, lack of exercise, and psychological stress. In addition, two large PPPs were in the center of the clot, which are associated with challenges to the bowel and reproductive systems. Finally, the central zone of the clot was dark, which is associated with bowel congestion. (2) The experimental live blood test showed normal rounded red blood cells that are separate and free-flowing, and no indication of cell wall-deficient microbial forms in the plasma. The OST revealed a normal profile and color.

The PPPs were reduced in size and number. The subject reported increased energy and less flatulence while wearing QLink-B.

Subject VIII: (1) The control live blood test showed irregularly shaped red blood cells with a tendency to aggregate and stack, as well as a moderate level of cell wall-deficient microbial forms in the plasma. The OST revealed many PPPs ranging over 40 microns throughout the clot, which is associated with cellular disturbance and disorganization. (2) The experimental live blood test showed normal, rounded, free-flowing red blood cells without stickiness or tendency to stack, and no indication of any microbial forms. The OST revealed a normal profile, with much fewer and much smaller PPPs. The subject reported experiencing an overall feeling of good health.

The conclusions from this controlled pilot study are as follows. In 8 out of 8 subjects in Group A, there was little or no difference observed in the results of the live and dry blood tests before and after wearing the sham QLink for 72 hours. In addition, all 8 subjects wearing the sham device reported few or no significant improvements in energy level, well being, or physiological function. On the other hand, in 8 out of 8 subjects in Group B, there were significant differences in the results of the live and dry blood tests before and after wearing the active QLink for 72 hours. After this time period of wearing the active QLink, the red blood cells as observed in live blood analysis appeared to be more normal in appearance and form, and without a tendency to aggregate or form stacks of cells. The number of microbial forms, colloidal deposits, and crystals observed in the plasma was reduced. The clot as observed in the OST showed a more normal profile in color and form, with the number and size of PPPs reduced or absent. In short, wearing the active QLink for 72 hours produced consistent improvements in the 2 blood tests in all 8 subjects.

What is the possible scientific basis of these findings? As the live and dry blood tests are used to test for disturbances in the biological terrain due to environmental toxicity, poor elimination of wastes, nutritional imbalances, and/or radiation toxicity, the results suggest that the QLink may help counteract such disturbances by stabilizing the biological terrain. The results show that wearing the QLink helps maintain normal, free-flowing red blood cells and reduces the tendency for them to aggregate or form stacks of cells. This may be interpreted to mean that the QLink is acting on the human biofield, which helps maintain the normal electrical properties (negative electrical charge) of the individual red blood cells. This helps them repel one another and maintain their integrity as seen on the microscope slide, and presumably also in the bloodstream. Blood would then flow better, with optimal circulation through the smallest microcapillaries, so narrow that blood cells must file through one at a time. Improving the microcirculation would lead to better nutritional delivery to the cells and tissues, better oxygenation, and better removal of wastes. All these enhancements would lead to an improved biological terrain. This is only one possible speculation, however, on how the QLink may act to produce the results observed in this study.

## **D. Organ Stressor**

### **A Double-Blind Study on the Effects of QLink on Human EEG Responses**

It has been demonstrated that there are a wide variety of different biological effects from applied EMF on the human central nervous system. These differences can be attributed to the variation in the field exposure parameters and differences in experimental design. For example, the duration of exposure to applied EMF influences the EEG, with transient (on and off) exposures producing the most pronounced changes<sup>50</sup>. In this study, the EEG of humans is measured and analyzed both qualitatively and quantitatively to ascertain the effects of applied EMF stress on subjects from transient exposure to an electric clock placed near their body, but unknown to them. Three different experimental conditions are studied: (1) Placebo (no metal pattern deposited on the plastic substrate of the unit) QLinks; (2) Inactive (Pre-master processor-treated) QLinks and (3) Active (post-master processor-treated) QLinks. The study is a double-blind controlled trial with cross-over design. This study was conducted by Norman Shealy, M.D., Ph.D.; William A. Tiller, Ph.D.; Timothy L. Smith, and Paul Thomlinson under the auspices of the Holos Institute for Research in Subtle Energies and Energy Medicine in Springfield, MO.

Participants were excluded from the trial if they had epilepsy, were currently taking any medications, or were under the age of 18. 27 subjects were involved in the trial, 16 females and 11 males, ranging in age from 18 to 61, with a mean age of 36 years.

A code was randomly assigned to the 3 groups of QLink pendants that were tested, and no one in the clinic knew this code during the duration of the study, although there was a visible difference in the unit that lacked the metal pattern and the other two. Each subject was randomly assigned to get 2 different treatments. Each treatment lasted 1 month and concluded in an EEG session that lasted about 1 hour, in which the EEG was measured using a Lexicore Neurosearch 24-channel system. Each subject was given earplugs, blindfolded, and placed on an exam table prior to the EEG session. In addition, a folded towel was placed on their chest to insure that they could not detect the presence of a pendant placed on the towel at an appropriate time during EEG measurement. Each EEG session consisted of a 20-minute baseline; a 5-minute exposure to a digital clock, the EMF stressor; a 5-minute exposure to pendant alone; a 10-minute exposure to pendant plus clock; and a 10-minute exposure with no clock or pendant. After that, the subject was given the same pendant and instructed to wear it for one month excluding bathing and sleep. After that, the subjects were measured in another EEG session in the same sequence as above. Then the subjects were told not to wear any pendant for one week and to return for another EEG baseline test. Then this entire process was repeated with a new pendant of a different type. At the conclusion of this second treatment phase, the code was broken and subjects informed about the types of pendants they had worn.

The results are in Table 8. For the 2 pre-treatments with the placebo pendant, 6 out of 18 testing sessions showed positive effects on the EEG; i.e., in 33% of these testing sessions, there were reduced EEG abnormalities. For the 2 post-treatment results for the placebo

pendant, this result is 11/18 or 61%. Therefore, wearing the placebo for a month appeared to condition it in a positive way.

**Table 8.** Protective Effects of the QLink Pendant Vs. Placebo

	Positive	Negative	Total
<b>1. First Pre-treatment</b>			
Active	12	8	20
Placebo	6	12	18
Inactive	11	9	20
<b>2. First Post-treatment</b>			
Active	3	6	9
Placebo	7	2	9
Inactive	5	5	10
<b>3. Second Pre-treatment</b>			
Active	5	5	10
Placebo	2	6	8
Inactive	6	4	10
<b>4. Second Post-treatment</b>			
Active	7	2	9
Placebo	4	5	9
Inactive	6	3	9

The data also show essentially the same results for the inactive and active QLinks. It was hypothesized by the experimenters that somehow the key processing information had been inadvertently transferred. Thus, if the data were combined, then 44 of 77 sessions show beneficial effects on EEG testing, or 57%. This ratio was the same for just pre-treatment and post-treatment.

Statistical analysis was done by using the Z-test for equality of proportions. Results indicated that the proportion of testing sessions demonstrating benefit from the active pendant was significantly larger than the proportion showing benefit from the placebo device (0.57 vs. 0.33,  $Z = 2.3$ ,  $p < 0.01$ ).

It was also found that the active QLink increases delta activity in the brain in all regions. For a typical subject, it was also found that the EMF stressor (digital clock) alone diminishes delta waves, but the clock applied with the active QLink brings the EEG back to pre-stressed baseline.

This study demonstrates protective effects of the active QLink in stabilizing the EEG in the presence of transient EMF stressors. The results show that the QLink is an effective device for relieving stress associated with low-level EMF. This suggests that it might be particularly beneficial for extremely sensitive persons who experience clinical symptoms

with such exposure. For future studies of this type, methodological design considerations should take into account the possible interaction of groups wearing pendants.

### **Effects of Wearing the QLink on Muscle Weakness and Other Chronic Symptoms Attributed to EMF Pollution**

Applied Kinesiology (AK) can determine health imbalances in the body by identifying weaknesses in specific muscles. By stimulating or relaxing these key muscles, an applied kinesiologist can diagnose and resolve a variety of health problems. Founded and developed in the 1960s by George Goodheart, D.C., AK is typically performed by chiropractors and other holistic health practitioners<sup>51</sup>. In this study, AK was used to test relative muscle strength to identify changes in muscle facilitation-inhibition patterns due to interactions with the environment. Specifically, it was used to assess the effects on subjects of external stressors such as EMF. Preliminary testing was initiated by Robert M. Blaich, D.C., a leading expert in applied kinesiology in private practice in Los Angeles, who used AK to investigate muscle weakness patterns in QLink wearers. The strengthening of weak muscles while wearing the QLink was consistently observed. Furthermore, it was observed that the QLink also diminished muscle weakness when the subject was exposed to EMF stress (preliminary data not shown).

A controlled clinical study was then designed to ascertain whether wearing a QLink could negate the muscle weakness related to the acupuncture meridian system exacerbated by EMF stressors. The hypotheses tested were the following: (1) Does wearing a QLink pendant reduce the specific muscle weakness exacerbated by EMF stressors in the immediate environment? (2) Does wearing a QLink pendant for 4 months reduce patients' symptoms to chronic EMF stressors? (3) What are patients' self-reports of their health and well being after wearing QLinks for 4 months? The study was conducted by Eric Pierotti, D.C, D.O., in private practice.

Twenty patients undergoing Applied Kinesiology (AK) treatment were selected for having a variety of physical symptoms (See Table 9) associated with chronic EMF sensitivity. Furthermore, these selected patients also displayed recurrent muscle(s) weakness related to the acupuncture meridian system, namely, therapy localization (TL) to the pulse points.<sup>52</sup> Therapy localization is a phenomenon in which muscle facilitation or inhibition of a patient's muscles, as measured by manual muscle tests, changes in response to the patient having digital contact with a dysfunctioning area on his/her body. (i.e. touching a dysfunctioning area causes a change in the result of the muscle test).

They were divided into the following 5 groups according to their ongoing exposure to various EMF sources. (1) computers (more than 3 hours/day exposure)---10 patients (7 female, 3 male); (2) industrial hairdryers—3 patients (2 female, 1 male); (3) high voltage power lines—2 patients (1 female, 1 male); (4) cellular phones—3 male patients; and (5) general exposure to television, microwave ovens, cars, geopathic stress—2 female patients.

**Table 9.** Patients' Chronic Symptoms and Complaints

Headache
Muscle tension of the neck and shoulders
Recurrent low back pain
Loss of coordination
Light-headedness
Dizziness
Depression and emotional changes
Allergies and digestive disturbances

All 20 patients were initially screened for general random muscle weakness as evaluated by AK testing procedures; muscle weakness associated with the acupuncture meridian system (TL of pulse points); and exhibition of mid-deltoid muscle weakness, unilaterally or bilaterally, during exposure to a computer as an EMF source. 20 out of 20 exhibited bilateral mid-deltoid weakness when tested seated at a computer.

The subjects were then retested using 2 different QLinks: an active unit, and a control or sham unit. These were placed in separate black string tie bags and handled by a 3<sup>rd</sup> party, who placed them around the necks of subjects. The experimenter and patients were kept blinded as to the identity of each unit. The re-testing with QLinks addressed the following: negation of the mid-deltoid weakness while exposed to a specific EMF source; change in the strength of the muscles previously found to be weak that are associated with the acupuncture meridian system; and change in the strength of muscles randomly found weak.

17 out of 20 subjects chose the active unit, as evidenced by the muscle response, to wear for the duration of the study, although they did not know at that time that the active units were the ones that showed the strengthened muscle response. The results indicate that 17 out of 20 subjects (85%) showed a marked change in muscle strength while exposed to an EMF source while wearing the active QLink. Moreover, these 17 out of 20 showed no change in muscle strength when the sham QLink was worn. Only 1 subject showed a change with the control pendant. 2 subjects showed changes to both pendants.

All subjects were treated for their symptoms as previously using standard AK protocols and chiropractic techniques. The muscle weakness found associated with the acupuncture meridian system was treated using tapping techniques and acu aids (small metal balls taped over acupuncture points to stimulate them mechanically) on the tonification points of the deficient meridians. All subjects were instructed to wear the QLink (active unit) during the day, with the option of taking it off at bedtime.

All subjects were monitored for 4 months, with initial weekly visits, which were gradually decreased in frequency to 1 month, to determine whether: (1) the initial muscle weakness associated with the acupuncture meridian system recurred and/or other acupuncture meridian system weakness presented; (2) there were any changes in the

subject's symptoms; and (3) the subject reported any changes to his/her overall well being. Each subject was examined, evaluated using AK procedures, and treated using only AK techniques on each subsequent visit, as per normal procedures specified in AK textbooks<sup>53</sup>.

The results showed that 18 out of 20 subjects (90%) showed no acupuncture pulse TL on all visits for the 4 months' duration of the study. 12 out of 20 subjects (60%) reported a marked improvement in their chronic symptoms. 4 subjects (20%) experienced improvements in at least one chronic symptom. 4 subjects (20%) reported no discernable change in their previous symptoms. No subjects experienced any worsening of symptoms or new symptoms appearing. All subjects reported greater emotional stability and better concentration since wearing the QLink.

The conclusions from this study are as follows: (1) A controlled double-blind experiment using a sham control and an active QLink showed that the active QLink but not the sham control improves muscle strength in EMF-sensitive subjects that show patterns of muscle weakness when exposed to EMF sources. (2) Wearing the active QLink for 4 months while receiving chiropractic and AK therapy reduces patients' symptoms due to chronic EMF stressors. (3) Patients reported improved psychological functions after long-term wearing of the QLink.

In the treatment study, because AK therapy and chiropractic adjustments were administered concomitantly while QLinks were also worn by the subjects, we cannot conclude that the QLink is the agent responsible for mitigation of symptoms. However, the results suggest this may be so, because these patients were chronic sufferers. No statistical measures were drawn from these studies, which involved small numbers of patients.

### **E. Organ System Stressor**

#### **Effects of the QLink Pendant on Electrical Resistance of Acupuncture Points and Associated Meridian Stress**

Tyteeka Reye, ND, DScF, who is in private practice at the Acacia Whole Health Clinic in Denver, conducted an initial controlled pilot study with statistical analysis to assess the effects of wearing the QLink pendant on skin conductivity when subjects were exposed to EMF stressors of various household electrical appliances. The method employed here is skin conductivity measurements of the acupuncture points using a clinical diagnostic device designed for this purpose. The clinical data collected by Reye in the study was independently submitted to Professor Michael Kundi, Ph.D., Head of the Department of Occupational and Social Hygiene at the Institute of Environmental Health, University of Vienna, to perform the final quantitative statistical analysis.

Health practitioners measure the stress associated with the acupuncture meridians by introducing a harmless, low-voltage electrical current at various acupuncture points and

measuring the level of electrical current conducted through them. This diagnostic is based upon the work of the German physician R. Voll, who discovered in the 1950s that certain acupuncture points showed abnormal readings of electrical conductivity or resistance when subjects were reacting to a stressor, such as an allergen, placed nearby their body<sup>54</sup>. H. Motoyama has demonstrated that 70% of this so-called skin conductance is associated with the internal body, and only 30% is due to the skin itself<sup>55</sup>. Extensive studies of these phenomena and the various devices used to test skin resistance have also been performed by William Tiller, Ph.D., at Stanford University<sup>56</sup>. Despite extensive scientific research, there is no consensus as to the understanding of this type of measurement, its perturbation by external agents, or its use as a diagnostic in medicine. Interestingly, the Office of Technology Assessment of the US Congress produced a report on the efficacy and safety of medical technologies, in which it is estimated that only 10 to 20 percent of all procedures currently in medical practice have been shown to be efficacious by controlled trials<sup>57</sup>. In any case, the Voll method has become the basis of a diagnostic assessment known as EAV (Electroacupuncture according to Voll), variously referred to as electrodermal testing and meridian stress assessment (MSA). It is used worldwide by numerous health care practitioners. There are a variety of different electrodermal testing devices on the global market, and some of these are FDA approved for meridian stress assessment as a form of galvanic skin response (GSR) biofeedback to electrical stimuli.

The instrument used to measure skin resistance in this study is the Computronix Acupro II, model Z-41, which is a type of EAV device. Each series of measurements made in this study included 40 defined points on the skin (20 points on the right side of the body, and 20 on the left). These are acupuncture points for testing the status of various acupuncture meridians. Measurements are made as follows. A stimulus of 1.25 volts is applied with an electrode probe at each acupuncture point, and the resistance is immediately measured. The device assesses the skin resistance in terms of conductivity, which is its reciprocal value, with a scale from 0 to 100, representing a conductivity range from 0.5  $\mu\text{mho}/\text{cm}^2$  to 200  $\mu\text{mho}/\text{cm}^2$ . Values below 50 are considered a sign of deficiency, congestion and/or blockage; values between 50-55 indicate a normal, balanced state; and values over 55 are considered a sign of inflammation.

24 adults, 10 males and 14 females, were enrolled in the trial, but 2 were excluded from the evaluation due to incomplete data. The subjects were randomly assigned to 3 test groups: (A) 13 subjects, 3 test conditions: baseline measurement, exposure to an electrical facial muscle stimulator, an applied EMF stressor, with and without the use of the QLink pendant; (B) 5 subjects, 3 test conditions: baseline measurement, exposure to an electric hairdryer, an applied EMF stressor, with and without the use of the QLink pendant; (C) 4 subjects, 2 test conditions: baseline measurement and the QLink pendant without any applied stressor.

The QLink pendant had not been worn for more than 2 minutes before the person was exposed to the applied EMF stressor, namely, either the electric facial muscle stimulator or the electric hair dryer, both of which were running on 60 Hz alternating current. One



of these devices was switched on and placed in the lap of the test person during the applied EMF stressor condition.

Prior to the data analysis, the distribution function with respect to skin resistance was inspected. Despite the fact that values vary between 0 and 100, it was possible to approximate the empirical distribution with respect to each measuring point fairly well by means of a normal distribution. Using the Kolmogorov-Smirnov statistical test, there was no significant deviation in any of the cases. Thus, the test results are well represented by the mean values and standard deviations. For each of the three test groups and the respective test conditions, the profiles of mean values with standard errors (SEM, Standard Error of the Mean) were determined for all 40 test points of each subject.

For statistical evaluation of the differences between the various test conditions, the measured results achieved for the 40 acupuncture points were categorized as follows: values below 40 (approximately 5.5  $\mu\text{mho}/\text{cm}^2$ ); values ranging from 40 to 50 (approximately 10  $\mu\text{mho}/\text{cm}^2$ ); values ranging from 50 to 55 (approximately 14  $\mu\text{mho}/\text{cm}^2$ ); values ranging from 55 to 65 (approximately 26  $\mu\text{mho}/\text{cm}^2$ ); and values of 65 and above. For each person and test condition, the numbers of test points out of 40 within these 5 categories was determined. With respect to groups A and A plus B, these results were analyzed by means of a multivariate analysis of variance followed by Tukey's HSD tests with respect to differences between the individual test conditions. Because of the small number of cases in groups B and C, the results of these two groups were analyzed separately for the four categories by means of univariate analyses of variance.

Results are shown in Figures 16 to 18 for the profiles of means of groups A to C and the 3 test conditions. Figure 19 shows the profiles of the means for groups A and B taken together for all test points and test conditions.

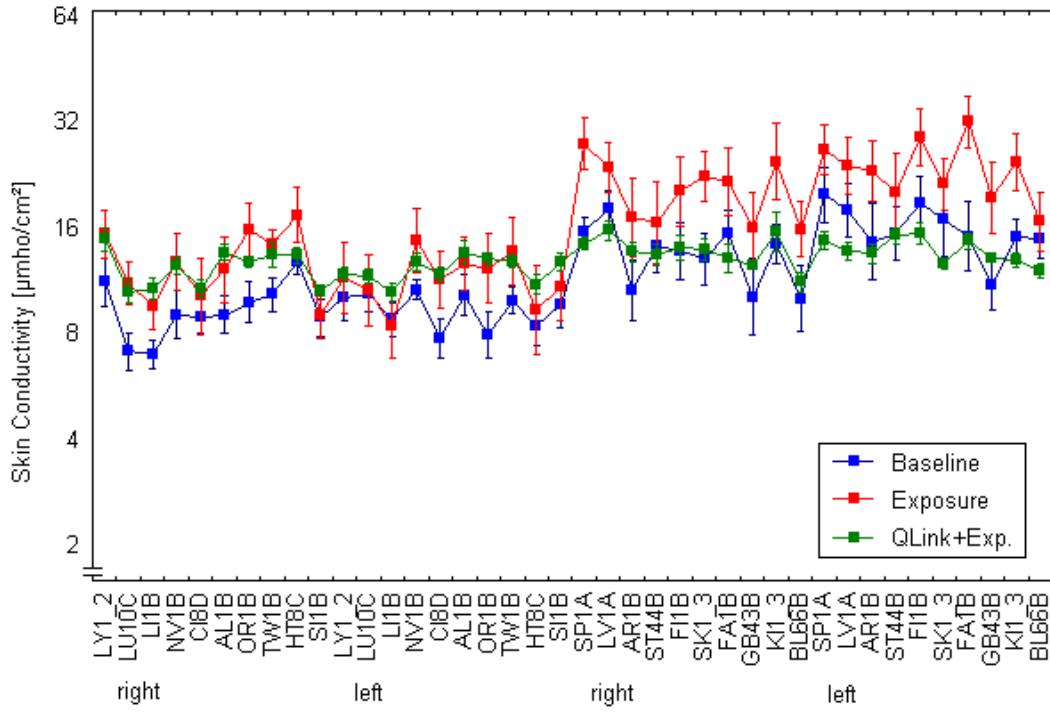


Figure 16. Means (+/- SEM) of group A (exposed to a facial muscle stimulator) for all test points

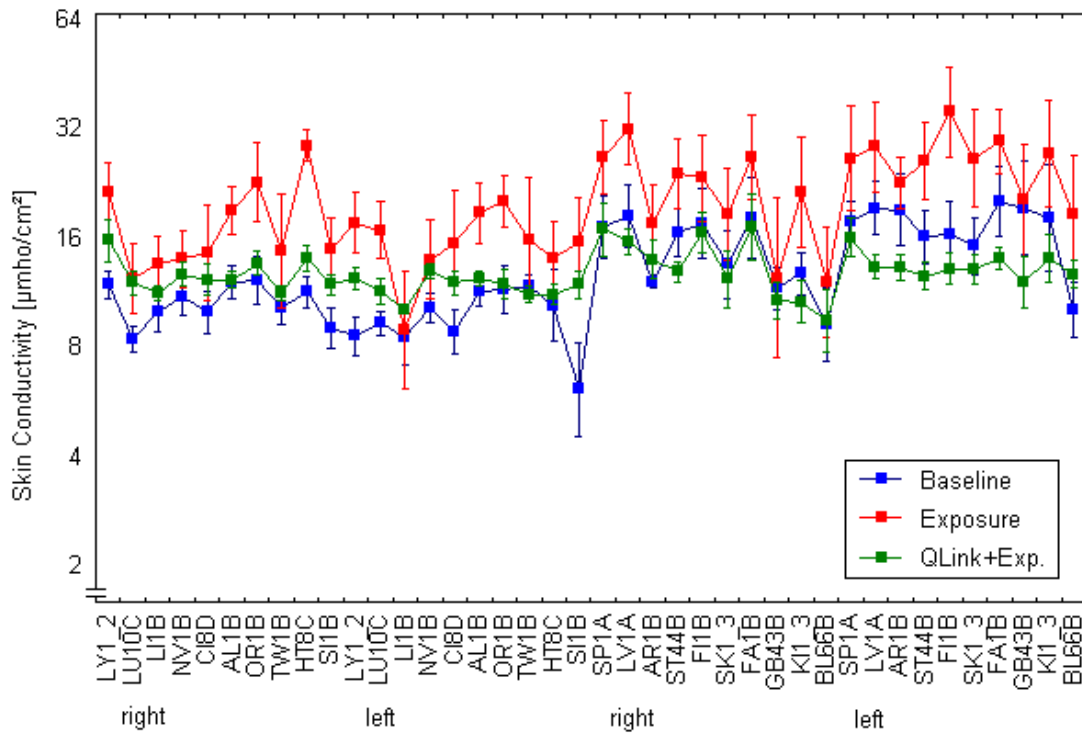
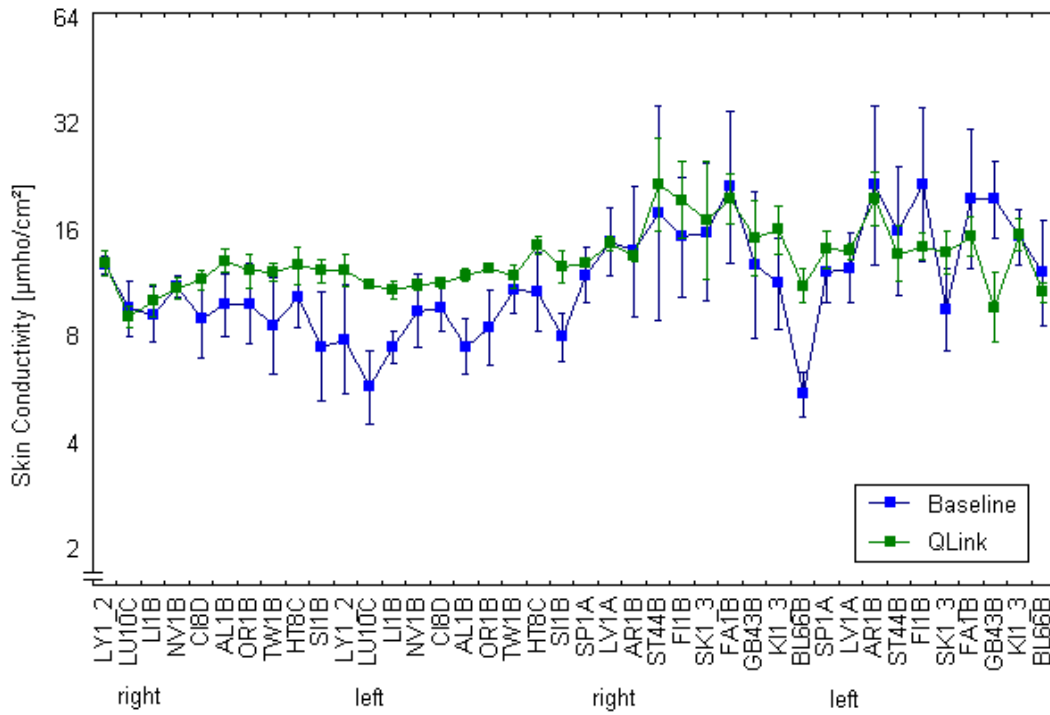
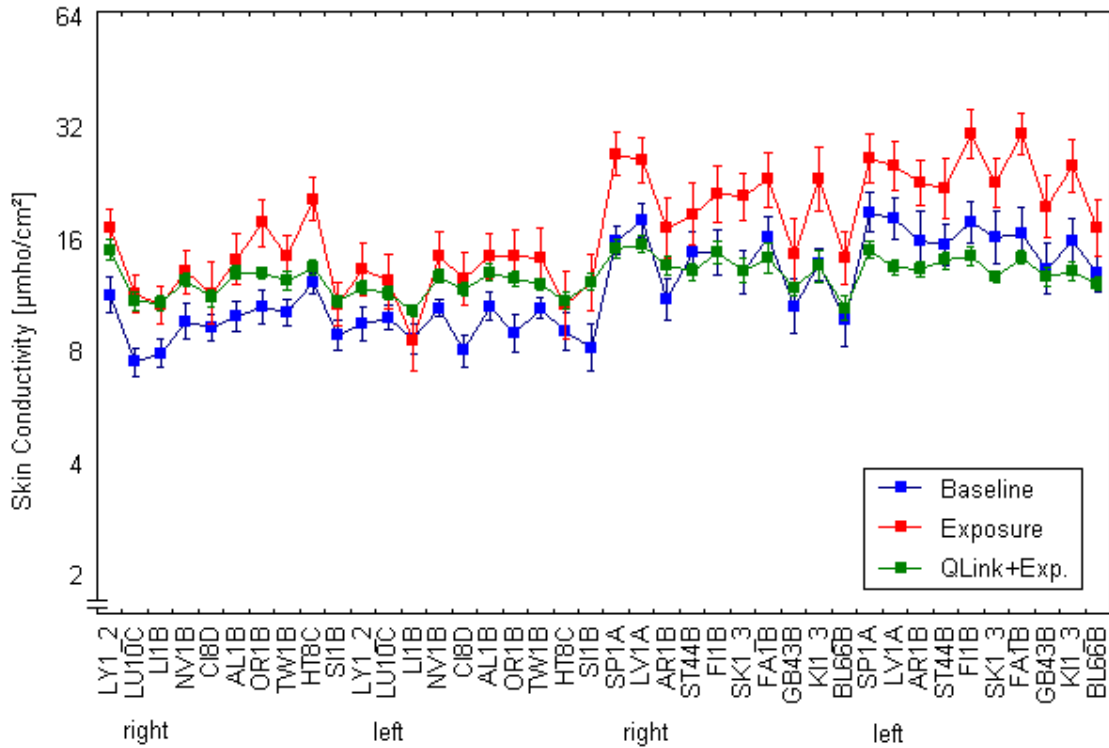


Figure 17. Means (+/- SEM) of group B (exposed to hairdryer) for all test points and test conditions.



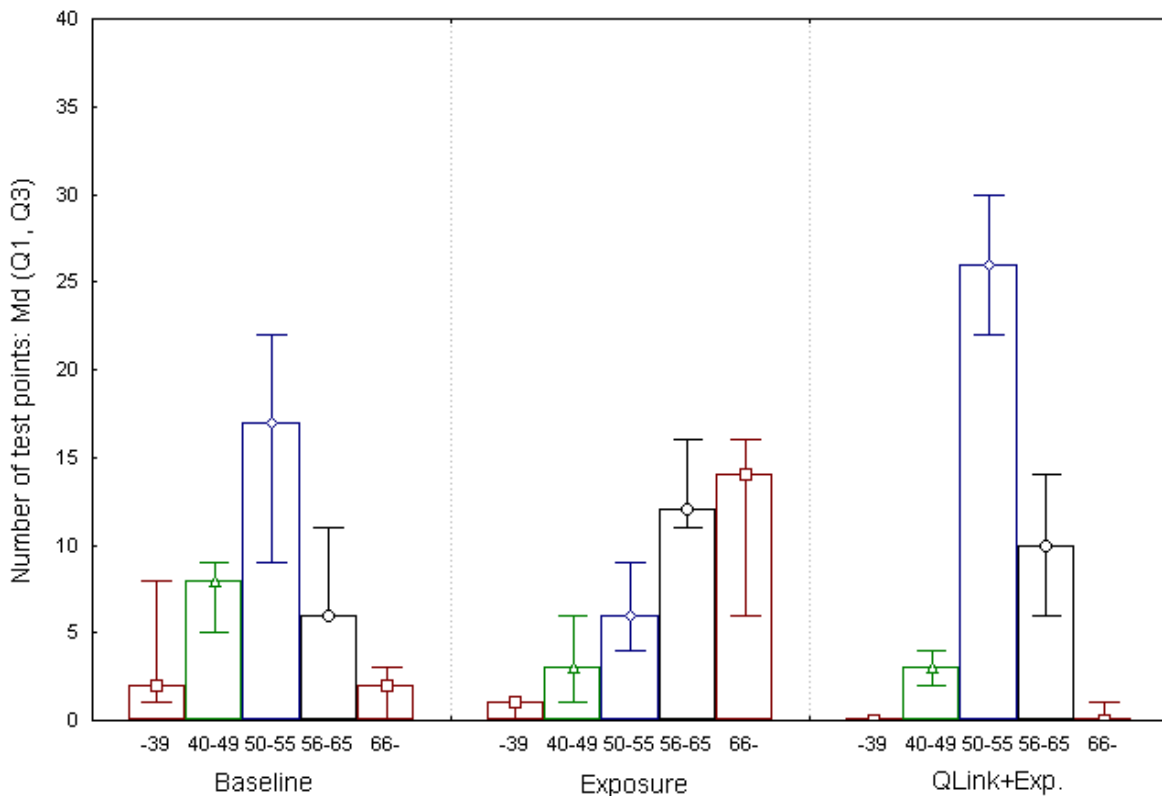
**Figure 18.** Means (+/- SEM) of group C (no exposure to electronic device) for all test points and test conditions.



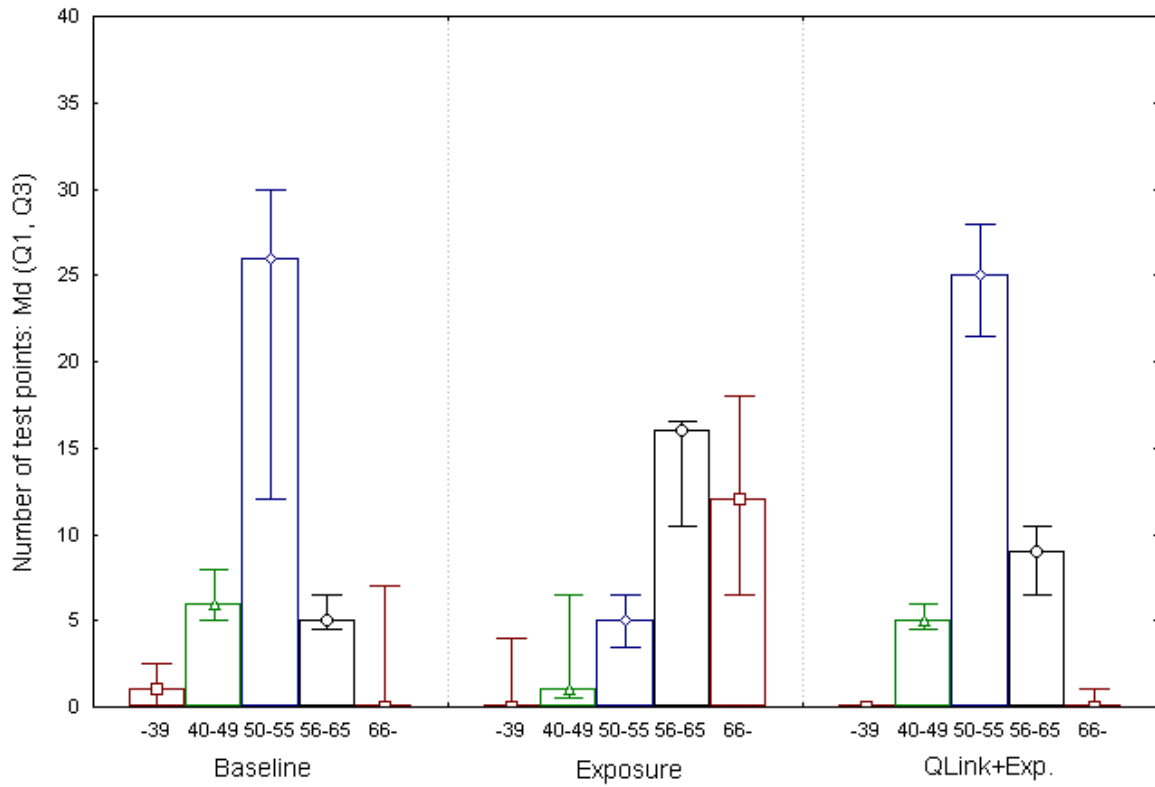
**Figure 19.** Means (+/- SEM) of groups A plus B (exposed to both electronic devices) for all test points and test conditions.

Most of the test points showed an increase in the GSR (skin conductivity) as compared to the baseline measurements when exposed to the applied EMF stressor. This was observed for both group A, exposed to a facial muscle stimulator, and group B, exposed to an electric hair dryer. Furthermore, if the QLink was worn at the same time as the EMF stressor was applied, this led to a reduction of conductivity towards balance and normalcy.

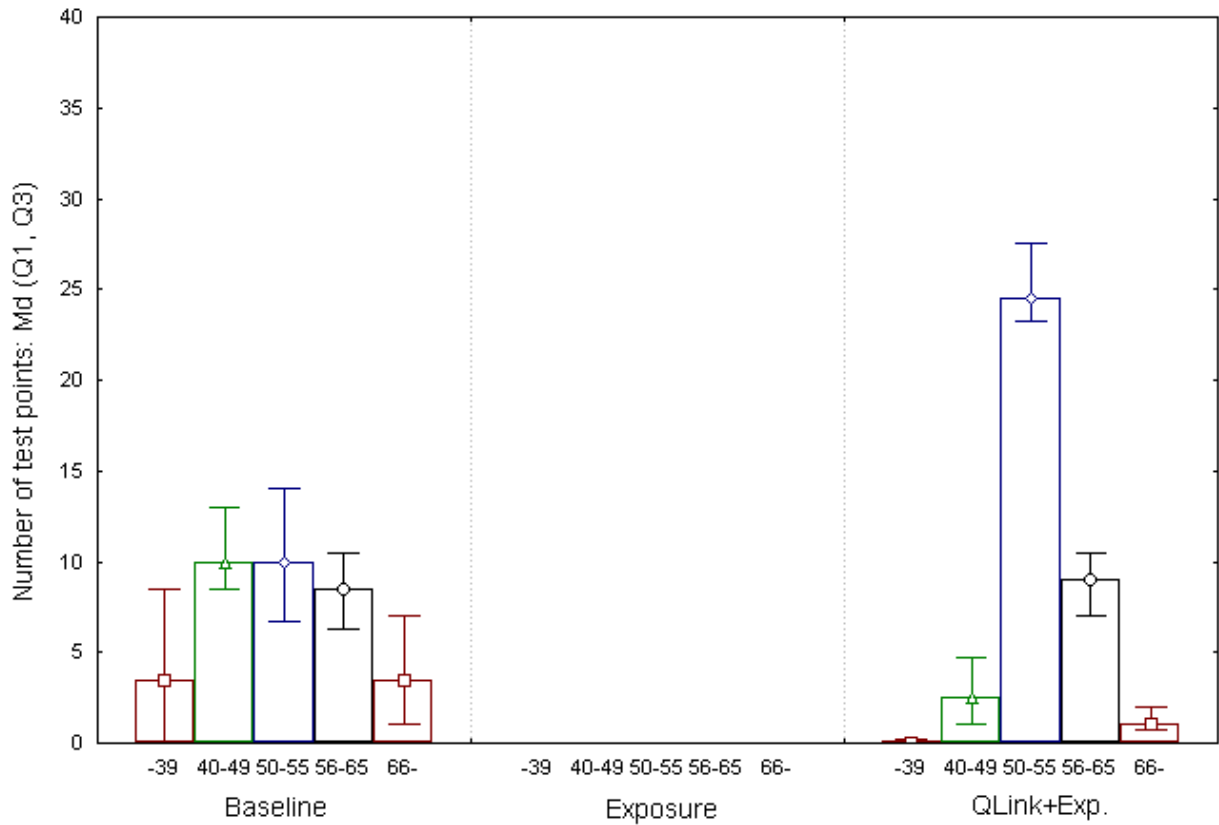
Group C showed a normalizing effect when the QLink was worn. That is to say, low baseline values were increased, and high baseline values were reduced for these subjects while they wore the QLink. Thus, an increased number of values were observed within the norm in the “balanced” range. These effects are shown in Figures 20, 21 and 22. The figures show the average of measured values within the different categories.



**Figure 20. Medians** (and first as well as third quartile) of the number of measured values (of 40) per person and test condition within the different categories of measured values for group A (exposed to a facial muscle stimulator). Values within category 50 to 55 are considered balanced.



**Figure 21. Medians** (and first as well as third quartile) of the number of measured values (of 40) per person and test condition within the individual categories of measured values for group B (exposed to hair-dryer). Values within category 50 to 55 are considered balanced.



**Figure 22. Medians** (and first and third quartile) of the number of measured values (of 40) per person and test condition within the individual categories of measured values for group C (no exposure to electronic device). Values within category 50 to 55 are considered to be balanced.

Results of the multivariate analysis of variance for Group A and univariate tests for the ranges 40-49; 50-55; 56-64; and 65 and above are shown in Table 10.

**Table 10.** Statistical results for univariate analysis of variance for Group A

Variable	Test size	df1/df2	p-value	post hoc comparison (p<.05)
Total range	Wilk's			
	F-value	5/8	0.0043	
40-49	3.85227	2/24	0.0354	B-Q
50-55	42.83636		0.0000	B-E B-Q E-Q
56-64	2.30075		0.1219	
65 & up	17.82986		0.0000	B-E E-Q

(where B=baseline; E=EMF exposure; Q=QLink + EMF exposure)

Significantly fewer subjects exposed to an applied EMF stressor show normal values between 50-55, which are optimal. This effect is reversed when the QLink is worn. A significantly higher proportion of subjects show normal values with the QLink on than at the time of the baseline measurements. The observed number of values above 55 and in particular, above 65, was much higher when subjects were exposed to an applied EMF stressor than at the time of baseline measurement. If the QLink is worn during this EMF exposure, this difference is not seen.

The results for group B are very similar to those for group A. Table 11 shows the statistical test results.

**Table 11.** Statistical results for univariate analysis of variance for group B

Variable	Test size	df1/df2	p-value	post hoc comparison (p<.05)
Total range	Wilk's F-value			
40-49	1.90190	2/12	0.1917	
50-55	20.86344		0.0001	B-E E-Q
56-64	4.39670		0.0369	
65 & up	9.76914		0.0030	B-E E-Q

(where B=baseline; E=EMF exposure; Q=QLink + EMF exposure)

In Table 11 the univariate analysis of variance for group B is performed. The difference between individual test conditions is tested. The last column shows the results of Tukey's HSD test, which compares the individual conditions of baseline, EMF exposure, and QLink during EMF exposure. The reduction in the number of values in the optimal range and the increase in the number of measurements with increased conductivity through stimulation by means of an electric hairdryer is reversed when the subject wears a QLink.

A comparison of the baseline measurement and the use of the QLink pendant without exposure to an applied EMF stressor showed that the use of the QLink pendant increased the number of optimum values. However, because only a small number of subjects were tested in this manner, only a tendency in the data is seen, without statistical significance. See Table 12.

**Table 12:** Statistical results for univariate analysis of variance for group C

Variable	test size	df1/df2	p-value
Ranges	F-value		
40-49	5.802842	1/3	0.0951
50-55	9.707070		0.0527
56-65	0.014778		0.9109
66 & up	4.373494		0.1276

This study was conducted to demonstrate the effects, if any, of the QLink pendant on skin conductivity for 22 subjects who were exposed to applied EMF stress from household electrical devices. 18 subjects were either exposed to a facial muscle stimulator or to an electric hairdryer as the applied EMF stressor. 4 subjects were tested only with respect to the QLink pendant compared to baseline without any applied EMF exposure. A baseline measurement at 40 acupuncture points was carried out for each person. In the case of the 18 subjects exposed to applied EMF stressors, a series of measurements was carried out at the same 40 points with and without the use of the QLink pendant. As this was a pilot study, neither the sequence of the tests was varied, nor was the study blinded.

The wearing of the QLink pendant without exposure to applied EMF stressors led to an increase in the number of measurements in the normal range (scale values 50-55). This result, however, was not statistically significant because of the small number of subjects (n=4). In case of exposure to applied EMF stressors, the skin conductivity was increased at almost all test points. This increase results in a significant increase in the number of measurements outside of the normal range, signifying an inflammatory reaction. The use of the QLink pendant while exposed to applied EMF stressors reduces the number of values that indicate inflammation or irritation of the respective acupuncture meridians and increases the number of values within the optimal range.

This study suggests that wearing the QLink pendant has a optimizing or normalizing effect upon the acupuncture meridian system, whether there is an applied EMF challenge or not. One may speculate that the QLink, by virtue of its subtle energy technology, is facilitating the homeostatic and homeodynamic mechanisms underlying the endogenous human biofield.

## **F. Behavioral Stressor**

### **Positive Effects on Learning Disabilities With EMF Stressors Present**

A one-month study was conducted by Evelyn Wiseman, Educational Director, New Way School in Scottsdale, Arizona. This is a small private school for children with learning disabilities, attention deficit disorder, and underachievers. These students have normal intelligence and potential, but have been failing in mainstream education for a number of different reasons, including hyperactivity, dyslexia, mild depression, and other reasons. None are emotionally handicapped, delinquent, behavior disordered, or mentally retarded.

52 students, ranging in age from 6 to 19, and enrolled at various levels from primary school to high school, as well as 11 teachers participated in the study. The school is situated near a power substation, and one or more computers are in each classroom with fluorescent lighting, creating EMF stressors throughout the building.

Two different application systems of SRT were used in the study: an active unit (Group A), and a placebo unit (Group B), in an alternating fashion each week as follows. At the



beginning of the 1<sup>st</sup> week, Group A units were placed throughout the school. At the beginning of the 2<sup>nd</sup> week, Group I units replaced them. During the 3<sup>rd</sup> week, Group A units were used once again, and in the 4<sup>th</sup> week, Group I units were used again.

As standard practice, behavioral tracking procedures in the form of a daily report card were in place and used at the school as a negative behavior modification technique for each student, grades 1 through 12. The teachers had been tracking each child’s behavior for several months daily before the study as a standard procedure. Eleven key behavioral categories already in use were tracked for the study. The teachers continued to perform the same evaluation process daily on each participating student. A controlled double-blind study was conducted in which the teachers did not know which unit was the active or sham unit. In addition, the students were naïve and unaware that a test was being conducted, as were the majority of the teachers. The following variables were addressed when analyzing the data: (1) variability of behavior of individual children (from one week to the next); (2) class/age variability; (3) variability of each of the 11 maladaptive behaviors; and (4) effects of categories of behavior (i.e., academic, emotional, social, and physical). Data were collected daily on each student.

The results are summarized in Table 13:

**Table 13.** Impact of SRT on Students with Learning Disabilities exposed to EMF stressors at New Way School

	GROUP "A" (Active Unit with SRT)	GROUP "B" (Placebo Units)	% DIFFERENCE SRT vs Placebo
<i>"Maladaptive Behaviour Event" Criteria</i>			
<b>ACADEMIC CRITERIA</b>			
<i>Not on Task</i>	67	128	-48%
<i>Trouble Following Directions</i>	65	132	-51%
<i>Work Not Completed</i>	22	42	-48%
<b>Academic Criteria Totals</b>	<b>154</b>	<b>302</b>	<b>-49%</b>
<b>EMOTIONAL CRITERIA</b>			
<i>Irritability</i>	37	61	-39%
<i>Outbursts</i>	23	55	-58%
<i>Withdrawn</i>	15	17	-12%
<b>Emotional Criteria Totals</b>	<b>75</b>	<b>133</b>	<b>-44%</b>
<b>SOCIAL CRITERIA</b>			
<i>Problems Interacting with PEERS</i>	43	41	5%
<i>Problems Interacting with STAFF</i>	20	27	-26%
<b>Social Criteria Totals</b>	<b>63</b>	<b>68</b>	<b>-7%</b>
<b>PHYSICAL CRITERIA</b>			
<i>Hyperactivity</i>	60	79	-24%
<i>Headaches</i>	17	18	-6%
<i>Fatigue</i>	36	49	-27%
<b>Physical Criteria Totals</b>	<b>113</b>	<b>146</b>	<b>-23%</b>
<b>TOTAL REDUCTION IN ALL "MALADAPTIVE BEHAVIORS"</b>	<b>405</b>	<b>649</b>	<b>-38%</b>

The results show dramatic decreases in behavioral problems in all 4 criteria when the Group A “active” SRT was used. The most dramatic changes were seen for the academic criteria, which encompassed the following behavioral problems: “not on task”, “trouble following directions”, and “work not completed”. In this category of academic criteria, the decrease in behavioral problems was 49% overall. The total reduction in all maladaptive behaviors when using active SRT was 38%.

These results are encouraging, although these data are preliminary due to the limited duration of the study and the small number of participants.

### **Positive Effects on Anxiety Levels of Students in a Public School**

This study was conducted by David Aaron Eichler, a doctoral student at Holos University in Springfield, Missouri and constitutes his Ph.D. dissertation. This is a controlled double-blinded study, in which neither the researcher nor the participants knew the identity of the sham and active devices until the study was completed and the data analyzed.

The hypothesis for this study is, does active SRT placed in the classroom in which ambient EMF stressors exist due to the presence of computers and other educational electrical devices influence the anxiety test scores of 6<sup>th</sup> graders? The test used is the State-Trait Anxiety Inventory for Children<sup>58</sup>, which measures both state-anxiety, the level of anxiety experienced at the given point in time at which the test is administered; and trait-anxiety, the level of anxiety experienced in general.

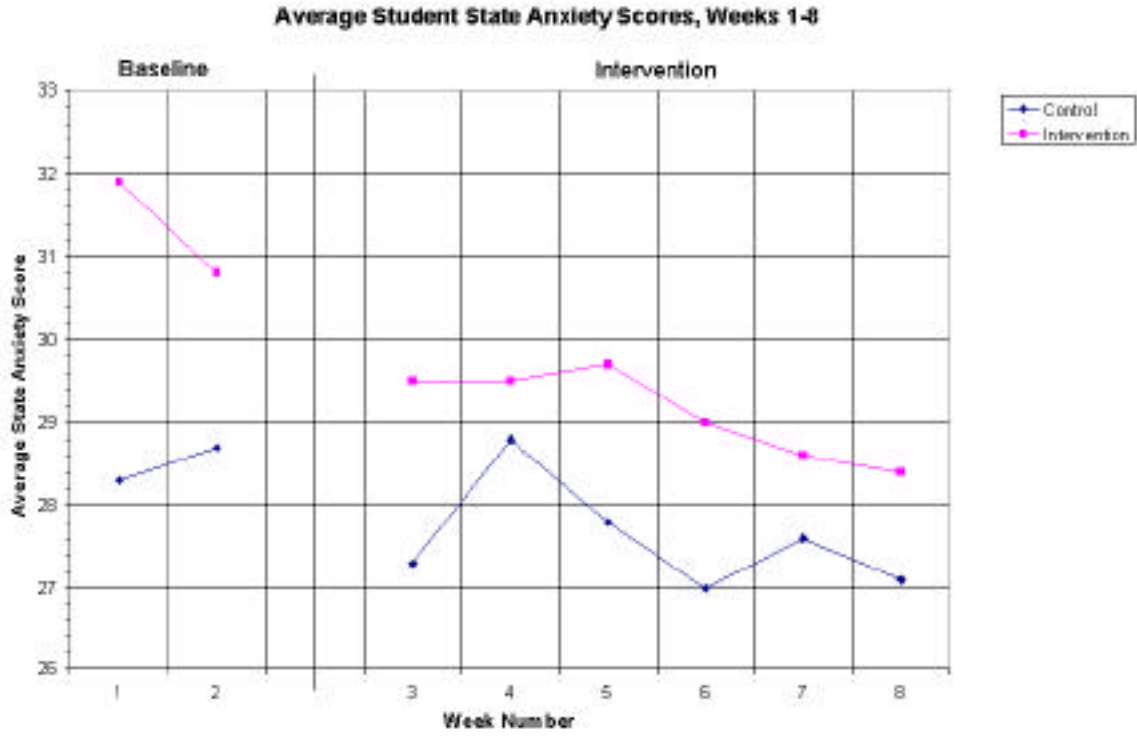
There were 184 subjects in the trial, 93 male and 91 female students from eight classes of 6<sup>th</sup> grade students, of average age 12 years, at a public middle school in Northeast Kansas. They were divided into 2 groups: A and B. In group A, the students remained with a single teacher for all 5 core subjects, while in group B, the students rotated for these subjects among 4 teachers. Subject criteria included the completion of baseline survey and intervention forms. 91 students, 49 from group A, and 42 from group B, met these criteria. Subjects were informed of the nature of the study as involving the effects of EMF in the classroom. The classrooms constituting groups A and B were separated from one another by approximately 76 feet.

The classrooms contained a 27-inch color television, a VCR, a computer, monitor, and printer for the teacher, and 2 or 3 computers, monitors, and printers for the students, and an overhead projector. EMF readings were measured using a field meter in each classroom, prior to the study. The gaussmeter registered at or below 1 mG where the students were seated, and 1 to 50 mG where the teacher was seated. In front of each computer workstation, EMF readings ranged from 5 to 50 mG.

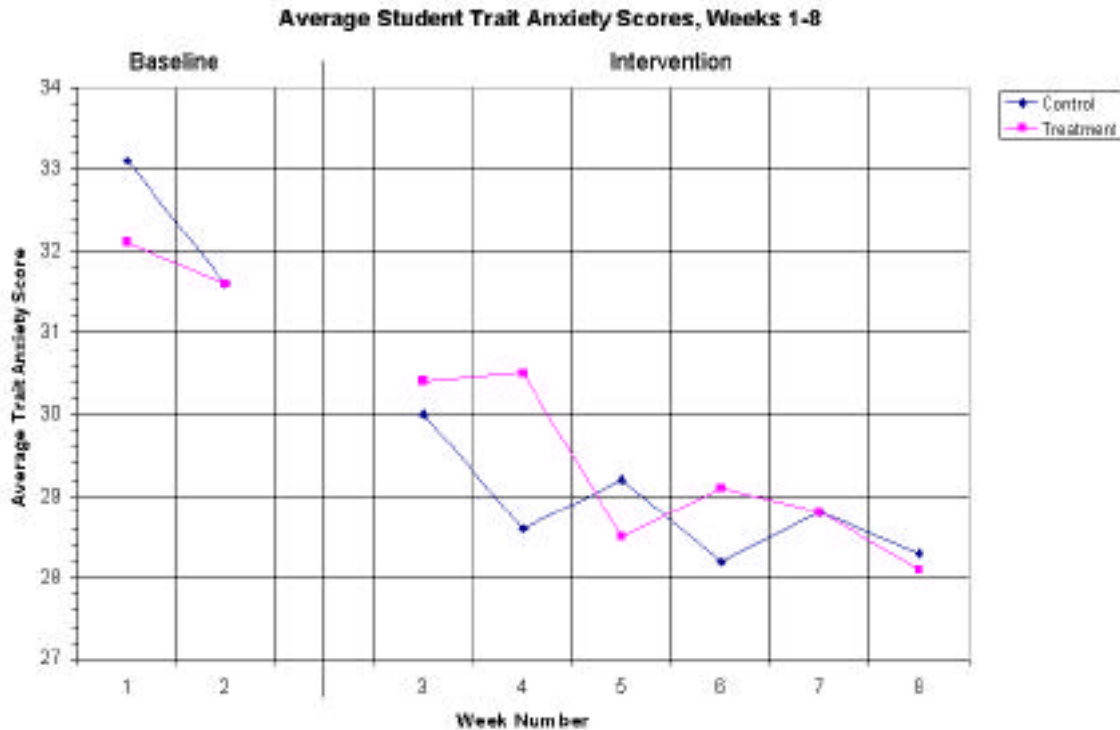
Following these baseline measurements and various surveys being completed by the students, the SRT units “ClearWave”, both active and sham, were plugged in within each classroom. Subjects were exposed to SRT only during the times in which they were in

one of their core classes, about 5 hours each school day. The entire study was 9 weeks' duration.

The numerical results of anxiety testing are summarized in Figures 23 and 24:



**Figure 23.** Average state-anxiety scores for control and treatment conditions, across 8 weeks



**Figure 24.** Average trait-anxiety scores for control and treatment conditions, across 8 weeks

The results were analyzed via t-tests and show no significant differences for either trait- or state-anxiety scores between the 2 groups during baseline conditions. A between-subject treatment effect test indicated a statistically significant difference between treatment at the trend level ( $0.05 < p < 0.15$ ) and control conditions for state-anxiety scores ( $p = 0.059$ ), but not for trait-anxiety score ( $p=0.782$ ). A statistically significant difference between the control and treatment groups for state-anxiety scores thus emerges at the 94% confidence level.

The basis for this difference is due to the active SRT, which acts to strengthen the human biofield when the ClearWave technology is placed in the vicinity of the user, protecting them from the effects of EMF and other stressors that may be present in the environment. In this study, the ambient EMF was relatively low, at 1mG or less, for the student exposure, which may have had an impact on the anxiety scores. While state-anxiety scores were statistically significant, no qualitative data was gathered in this study that might reveal the subjects' subjective impressions of their environment. Moreover, no correlation between subjective impressions and state-anxiety scores has been published that might be revealing.

This study has implications for the classroom and beyond. Reduction in anxiety in the classroom through SRT would assist those who tend to have performance anxiety during examinations. It may also mitigate feelings of frustration, hostility, depression, frustration, isolation, etc., that are associated with acts of violence in schools. It is possible that SRT in the classroom may reduce these feelings and with that, banish

violence. It is also possible that SRT in the classroom may help students more successfully concentrate and achieve new learning. The main limitation of this study is its short duration. Further studies in the presence and absence of SRT would be worthwhile to assess the long-term effects of using the technology on mood and other psychological states and mental performance.

## **Conclusions**

As technologically advanced societies grow more complex with an increasing number of EM appliances, the wireless world of communications, new chemicals introduced into the environment, and other stressors imposed on them, people need new ways of coping with multiple stressors and stress. There are many ways to relieve stress, including relaxation techniques, massage, meditation, and other approaches, which typically require time-consuming individual practice or visits to a practitioner. This paper demonstrates that SRT in consumer products such as the QLink pendant, QLink Ally and ClearWave that are simply worn or placed in the immediate environment can protect against stress from a variety of types of stressors—including EMF and chemical toxins---and help maintain a homeodynamic balance. As a result, performance, wellness, and dynamic stability as shown in this paper are enhanced.

The comprehensive results of SRT mitigating the stress response in a variety of biological systems and at various levels of system organization are depicted in this paper. Studies on stressors impacting numerous levels of biological organization, as shown in Table 1, from the molecular level to the behavioral level were performed. The biological systems investigated include protozoa, human cell cultures, blood tissue, brain function (EEG), muscle strength (AK testing), skin resistance of acupuncture points, and human behavior (anxiety and learning disabilities). These represent the wide scope of studies on SRT that have been completed. A spectrum of beneficial effects was observed on all these living systems. Moreover, some of these studies were conducted in a rigorously controlled, double-blind manner using placebo controls, which is the gold standard of clinical research.

Although the exact mechanism by which SRT interacts with the biofield is not yet fully understood, its very nature as a subtle field device requires that we focus on a field model of life rather than the conventional biochemical model in attempting to explain these results. By this model, life is defined as an electromagnetic, dynamical, nonlinear system continuously sensing and responding to ambient EMF and other informational signals in the environment, which may be stressors posing endless challenges. This biophysical view embraces the complex, holistic dynamics of organisms. It suggests that SRT may act as a subtle nudge to life's natural dynamics, as living systems already possess the creative potential for self-restoration embedded in their dynamical design. A proposed modus operandi for how SRT interacts with the biofield via resonance to reinforce it and stabilize the homeodynamics of living systems is offered.

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# CURRICULUM VITAE HIGHLIGHTS

(DEC. 2000)

## BEVERLY RUBIK, Ph.D.

### PRINCIPAL RESEARCH AND EXPERTISE

In the specialties of Integrative Medicine, bioelectromagnetics, cellular biophysics, biochemistry and Alternative and Complementary Health Modalities, Dr. Rubik has served in key roles:

- on the White House Health Care Task Force Meeting on Alternative and Complementary medicine;
- in many Advisory Boards including several for the National Institutes of Health, Bethesda, MD.;
- as a well respected International Keynote Speaker in Japan, Italy, Canada, Germany, Mexico and the USA;
- as University Faculty Member and University Administrator in several Universities including University of Arizona, San Francisco State University, and Temple University, and
- as Author in peer-reviewed national and international publications.

### EDUCATION

Ph.D. Biophysics, University of California, Berkeley 1979.

B.S. Chemistry, Illinois Institute of Technology 1972.

### INTERNATIONAL ADVISORY BOARDS

Scientific and Health Institutes, Medical Schools and Universities, and Corporate examples:

- National Institutes of Health, Bethesda, MD., Office of Alternative Medicine, including Program Advisory Council and Bioelectromagnetics Panel. 1992 to 1994.
- University of Arizona Medical School, Tucson, AZ. Program in Integrative Medicine. 1995 to present.
- International Advisory Board, The International Joseph H. Navach Project, Human Energy Systems Laboratory, University of Arizona, Tucson, AZ. 2001.
- Product Research Council, Starlight International, Monterey, CA. 1993 to present.
- Scientific Advisor, Healthy Check, San Francisco, CA. 2001 to present.
- Scientific Advisor, Kirlionics Technologies International, St. Petersburg, Russia. 1999 to present.
- Advisory Committee, the Ministry of International Trade and Industry (MITI), JAPAN. 1999 to present.
- Scientific Advisory Board, Health Medicine Forum, Walnut Creek, CA. 1998 to present.
- John Templeton Foundation, Radnor, PA. 1995 to 1997.
- The Arizona Center for Health and Medicine, Phoenix, AZ. 1995 to present.
- HealthWorld Online, [www.healthy.net](http://www.healthy.net). 1996 to present.
- Biomed Comm Inc., Scientific Advisory Board, Seattle, WA . 1997 to present.
- Several medical journals including *Journal of Complementary Therapies in Medicine*, *European Journal of Classical Homeopathy*, *Alternative Therapies in Health and Medicine*, and *Alternative Health Practitioner*, *Journal of Complementary and Natural Care*.

### KEYNOTE SPEAKER

Keynote speaker as well as invited guest speaker and lecturer in over 50 professional and academic symposiums, lectures, and conferences throughout the United States and internationally. These include :

- Biophysics of Healing Processes at conference on Art and Science of Healing, North Broward Hospital District, Ft. Lauderdale, FL. 1999.
- Energy Medicine. Health Medicine Forum Conference on Integrative Medicine, Walnut Creek, CA. 1998.
- International Association of New Science, Denver, CO. 1997.
- Bioelectromagnetic Applications in Medicine, Alternative Therapies Second Annual Symposium, Orlando, FL. 1997.
- Organizing Committee, 1st International Conference on Consciousness, New Medicine, and New Energy, Tokyo, Japan. 1996.
- International Conference on New Paradigms in Science and Education, Autonomous University of Baja California, Mexicali, Mexico. 1996.

- 1st International Conference on the Physiology of Acupuncture, Medical Acupuncture Research Foundation, Crystal City, VA. 1996.
- 19th Annual Symposium, American Holistic Medical Association, Philadelphia, PA. 1996.
- Integrating Managed Care and Alternative Medicine, meeting hosted by Inst. for International Research, San Francisco, CA. 1995.
- Symposium chair and invited speaker on Energy Medicine Symposium at annual conference of the Drug Information Association, Orlando, FL. 1995.
- Italian Homeopathic Foundation, Naples, Italy. 1995.
- Biophoton Emission to Japan Psychotronics Institute, Tokyo, Japan. 1994.
- Scientific Basis for Homeopathy and Energy Medicine. Annual Conference of the National Center for Homeopathy, Chicago, IL. 1994.

## FACULTY

Has served as faculty member in Universities, Colleges and Institutes including:

- The Union Institute, Graduate College, Cincinnati, OH., Professor, 2000 to present.
- University of Arizona, College of Medicine, Program in Integrative Medicine, Tucson, AZ. Visiting Assistant Professor, 1999 to present.
- Calif. Inst. of Human Science, Encinitas, CA., Adjunct faculty member, 1997 to present.
- California Institute of Integral Studies, San Francisco, CA., Visiting Associate Professor, 1985
- San Francisco State University, San Francisco, CA., Assistant Professor in various departments including Physics, Chemistry, interdisciplinary science and NEXA Departments, 1979 to 1988.
- John F. Kennedy University, Orinda, CA., Adjunct Professor in Holistic Health Studies, 1981.

## RELEVANT PUBLICATIONS

As well as being an editor and editorial consultant to several publications, over 50 contributions by Dr Rubik have been published including:

- (2000). Subtle Energies in Biology and Medicine. In Akutsu, Jun (ed.), Shocking Science (In Japanese) Tokyo: Tokuma Press, p.57-70.
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