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Sympathetic Resonance Technology™: Scientific Foundation and Summary of Biologic and Clinical Studies

BEVERLY RUBIK, Ph.D.

ABSTRACT

Sympathetic Resonance Technology™ (SRT; Clarus Products, International, L.L.C., San Rafael, CA) is a novel technology used in consumer health care products to protect humans from the potentially harmful effects of stress. A summary of the previously unpublished studies on SRT, both basic and clinical, is presented. These studies collectively show that SRT mitigates the stress response for a variety of stressors such as chemical and electromagnetic stress in various biologic systems and multiple levels of organization, ranging from the molecular to the behavioral. A rudimentary model of how SRT may work at the level of the biofield, the endogenous electromagnetic field of the organism, is proposed. By interacting with key component frequencies in the biofield, SRT may stabilize the organism homeodynamically, thereby protecting it from the effects of stressful stimuli.

INTRODUCTION

Sympathetic Resonance Technology™ (SRT) is a proprietary technological development that has been shown in various laboratory and clinical trials to affect physiologic processes in cells, humans, and other biologic systems. Used in consumer products such as the QLink® Pendant, which is worn on the body, and the QLink Ally® and QLink ClearWave® devices, all manufactured by Clarus Products, International, L.L.C., San Rafael, CA) which are placed in the local environment, SRT is proposed to involve field interactions with organisms because it shows action over a distance. The principles underlying field interactions on living systems, such as the effects of low-level nonionizing electromagnetic (EM) fields, are not well known to biologists, who typically focus on the biomolecular aspects of life. Thus, some definitions of terms is in order. Key scientific terms and concepts include *stressors* (Selye, 1978) and how they lead to *stress* (Selye, 1978) and other health problems; the effects of stress on homeostasis and *homeodynamics* (Lloyd et al., 2001; Yates, 1994) the *biofield* (Rubik, 2002; see pp. 000–000; Zhang, 1995) as proposed regulator of homeodynamics; *EM pollution* (Carpenter, 1995) as one type of stressor; the science of *bioelectromagnetics* (Papatheofanis, 1987) and beneficial low-level, nonionizing EM fields used in medicine; a new concept of bioinformation (Popp, 1988) conveyed by EM signals; *nonlinear dynamic systems theory* (Haken, 1977) as a model for the dynamic properties of biologic systems; and a *field model of life* (Rubik, 2002; see pp. 703–717).

For more than a decade, biomedical re-

Institute for Frontier Science, Oakland, CA, and Graduate College, Union Institute and University, Cincinnati, OH.

Editor in Chief's Note: *The technology and the phenomena described in this paper are new, proprietary, remain unexplained, and may appear implausible. However, the editorial team and our peer reviewers considered it more important that all that is currently available on the subject of Sympathetic Resonance Technology be published to stimulate further debate, and above all to stimulate further research. Already considerable sums are being made available by the National Institutes of Health to study what are currently referred to as subtle energy phenomena.*

searchers worldwide have contributed to the research findings on SRT summarized in this paper.

BACKGROUND

Stressors cause stress

According to the American Stress Institute (Rosch, 2002), a nonprofit organization founded by biomedical experts to serve as a clearinghouse for providing information on stress, 43% of all adults suffer adverse health effects as a result of stress. An estimated 75%–90% of all visits to primary-care physicians are for stress-related complaints or disorders. Stress has been liked to all leading causes of death, including heart disease, cancer, lung ailments, accidents, and suicides. Stress is responsible for more than half of all workdays lost annually (absenteeism). Stress is implicated in gastrointestinal, skin, neurologic, emotional, cardiovascular, and immune disturbances, ranging from the common cold to arthritis, cancer, and autoimmune deficiency syndrome. Approximately 80% of the health problems in technologically advanced societies are considered to be stress-related. Thus, stress has become the greatest threat to the health and well-being of our civilization.

The concept of stress in biology and medicine was first articulated by Selye (Selye, 1970), who began his pioneering research back in the 1930s. An organism responds to stressors (health-challenging stimuli) with appropriate responses as well as nonspecific responses—stress responses (Selye, 1978). For example, if the body temperature is too high, perspiration is the specific response that cools the body via evaporation. There are a host of nonspecific responses (stress responses). Under threat, humans exhibit the well-known "fight-or-flight" response in which adrenaline is released and a cascade of biochemical and physiologic events occur, leading to increased heart rate, increased blood pressure, reduced immune function, etc.

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

Humans face innumerable stressors each day. Some examples of physical stressors are pollutants in air and water, temperature extremes, lack of restful sleep, extreme physical exertion, and EM pollution. There are also mental and emotional stressors that provoke stress responses. All of these stressors disturb homeostasis.

The most aggravating forms of stressors are transient ones (i.e., a pulsed stressor such as an applied pulsed EM field from the use of cellular phones and other appliances that are turned on and off). If prolonged, such stressors upset normal functioning and disturb mental and physical performance. The "rainbarrel" concept of stress proposes that these effects accumulate like drops of water in a barrel, leading to exhaustion, premature aging, poor performance, minor illness, and eventually chronic disease. Thus, either severe acute stress or prolonged chronic stress can cause illness, which increases stress further, 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.

Homeostasis and homeodynamics

The concept of homeostasis—that the organism must maintain its physical and chemical parameters within a certain range for proper function—is being replaced by homeodynamics, which arose from new biophysical theory over the past few decades. The author discussed homeodynamics in another paper published in this issue of the Journal (Rubik, 2002; see pp. 703–717. Homeodynamics maintains that living systems have no ideal steady state because they are endlessly responding to stressors. Each time a new stressor is encountered, the organism cannot return to its previous dynamic state, but establishes a new dynamic balance appropriate to this newly integrated experience.

The biofield hypothesis

It has been hypothesized that there is an organizing field of the organism called the biofield, which is an important regulator of homeodynamics. The biofield hypothesis was

TABLE 1. ADAPTATION OF BIOLOGIC SYSTEMS TO STRESSORS

Level of action of stressor (examples)	*Biologic responses (examples)*
1. Molecular (mutagen, free radicals)	DNA repair, acute phase proteins, protein degradation, free radical scavenging
2. Cellular (chemical toxin, starvation)	Cell proliferation, apoptosis
3. Tissue (wound, injury)	Regeneration; repair
4. Organ (chemical toxin)	Modified organ function; detoxification, changes in blood flows
5. Physiologic system (diminished oxygen)	Changes in thermoregulation, immune system, endocrine systems
6. Whole organism (heat, cold, psychologic trauma)	Behavioral adjustments, including avoidance, aggression, motivation

presented by the author in another paper published in this journal (Rubik, 2002; see pp. 703–717). Developed from biophysical concepts, this hypothesis posits that it is the complex, dynamic, extremely weak EM field associated with the organism that conveys information throughout and is informed by the organism's constituents as well as by the environment.

The biofield is a useful construct and offers a unifying hypothesis to explain the interaction of objects or fields with the organism. SRT technology is considered from the perspective of the biofield hypothesis in this paper.

EM pollution as a stressor

EM pollution is an invisible stressor that has a variety of effects on the body. EM fields fall into two categories: (1) ionizing EM fields, such as ultraviolet light and X-rays, well known to cause physical damage in biologic tissues; and (2) nonionizing EM fields, which, for a long time, were not considered to be damaging or stressful except at high intensities where they might heat tissue. However, extremely low levels of nonionizing fields cause: (1) altered calcium ion flux in many cell types including brain and heart (Blackman, 1990); (2) reduced melatonin in animals and humans (Graham et al., 2000); (3) effects on animal embryogenesis and development (Cameron et al., 1993); and (4) effects on human performance and psychophysiology (Crasson et al., 1999). Nonionizing EM fields range from extremely low frequency to radiofrequency, microwave, radar, and other broadcast bands and can produce effects in humans and other biologic systems (Polk and Pastow, 1986), depending on field configuration and exposure pattern (Adey and Lawrence, 1984). These findings are the cornerstone of bioelectromagnetics.

Double-blinded, randomized controlled trials have shown that humans exhibit a range of responses to low-level EM stressors such as the ambient EM fields emitted by computers and other office equipment or home appliances (Rea et al., 1991). This includes profound symptoms such as spastic muscles, regional muscle weakness, headaches, and fatigue. Low-level nonionizing EM 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 disruption of biologic rhythms (Rubik, 1997).

In addition to their role as stressors, some extremely low-level nonionizing EM fields have beneficial effects on organisms (Rubik, 1997). These may provide EM bioinformation (information conveyed by EM fields) (Popp, 1988), for example, via resonance or entrainment with components of the biofield. Such interventions may act as tiny nudges in accordance with the body's natural dynamics to promote homeodynamic balance.

Electromagnetic bioinformation

The concept of bioinformation in biomolecular science is based on biochemistry; this is information conveyed by various biomolecules (e.g., DNA, RNA, hormones, receptors, etc.).

However, this concept can be extended to include a biophysical model based on field interactions (i.e., information carried by energy in low-level EM fields, encoded in the dynamic wave train).

One common feature of energy medicine modalities is that they involve extremely low levels of energy, even negligible amounts, yet they are capable of producing dramatic changes in organisms. A concept of information-containing energy has been proposed to underlie the action of all types of energy medicine modalities (Rubik, 1995) (acupuncture, homeopathy, healer interventions, and bioelectromagnetic therapies).

As part of biologic regulation and maintenance of homeodynamics in the organism, cells and tissues may engage in continuous EM-field signaling by which they exchange information. This may be an inherent communication system in the organism, in which the constituents of life are both antennas and receivers of information-carrying EM signals.

Observations that extremely low-intensity nonionizing EM fields, having even less energy content than physical thermal noise, can produce biologic effects has been interpreted to mean that they must be acting informationally rather than energetically on organisms (Adey and Bawin, 1977; Rubik et al., 1994). This has been called electromagnetic bioinformation (Popp, 1988). There is no consensus on the mechanism but classic physics does not anticipate effects from intensities so low that they are energetically indistinguishable from ambient noise. Proposed mechanisms of action involve nonlinear, nonequilibrium, dynamic systems theory described briefly in the next section.

Nonlinear dynamic systems theory of life

Nonlinear dynamic systems theory began in the 1970s (Jantsch, 1980). It addresses the behavior of complex living systems and their exquisite sensitivity to extremely low-level stimuli, even that of a single photon. Other features of living systems that challenge classic physics are being far from equilibrium, exhibiting dynamic self-organization, and showing nonlinear responses to stimuli such as stressors. Presently accepted as the best theoretical model of life's dynamics, some of the features that have been modeled include nonlinear responses to stressors. That is, the organisms may respond to multiple stressors with heightened responses that are unpredictably large.* This theory anticipates how multiple stressors can lead to breakdown and disease. Nonlinear dynamic systems theory is discussed in another paper published in this issue (Rubik, 2002; see pp. 703–717).

A field model of life

There are many ways of describing and modeling the properties of nature: causal, functional, reductive, and holistic accounts all exist. Scientists may invoke the appropriate model necessary to explain the observations at hand. It must be pointed out, however, that molecular reductionism dominates biology and medicine. However, many observations, such as the mechanism of action of certain alternative medicine modalities that may involve field interactions (Rubik, 2002; see pp. 703–717), challenge the molecular view.

According to physics, particle and field interactions are considered to be fundamental, complementary models of nature, as in the particle–wave dualistic model of light. In considering the field interactions of SRT on living systems, a field model can be used. The experimental observations indicate that SRT gives rise to a wide range of effects on biologic systems and acts at multiple levels of biologic organization from the molecular level to that of the cell, tissue, organ, and on to the level of human behavior. A field model of life that deals with global properties of biologic systems and its system dynamics is posited to build a scientific foundation for the interactions of SRT on living systems.

In this model, all components of life, including its biomolecules, play roles in rhythmic patterns of activity, from the ensemble of constituents giving rise to the biofield, the endogenous EM field of the organism. This paper proposes that SRT mediates its effects by in-

*Rubik B. A Systems Approach to Bacterial Chemotaxis [dissertation]. Berkeley, CA: University of California at Berkeley; 1979.

teracting with the biofield. This is explained in the next section.

THEORY AND BACKGROUND OF SRT

SRT is the name of a technology that emerged from research on the frontiers beyond conventional EM fields. SRT involves subtle energy, an energy that has certain properties of EM fields but is subtle so that its key frequencies cannot be detected by using conventional EM detectors. SRT has been shown to have physical effects on both nonliving systems such as redox chemical reactions (not yet published) and living systems, although only the effects on the latter are presented here. Although the precise *modus operandi* in living systems is not yet fully known to science, the present scientific understanding is offered here.

According to quantum physics, all matter can be regarded as condensates of energy or waves. It has been proposed that matter has the capacity to store and transmit information in novel ways, dependent on its wave-like character (Del Giudice et al., 1988; Del Giudice and Preparata, 1991; Preparata, 1992). It is possible that the inventors of SRT may have discovered a new way of storing information in matter that is consistent with quantum theory, using a proprietary method. However, the inventors suggest that the applicability of quantum theory to SRT, even if it is accurate by quantum principles, would produce only a partial picture of the entirety of effects created by SRT because the dynamics of subtle energy are not yet well understood.

It is proposed that the biophysical model of life based on the biofield—its dynamic energy and field properties—may be central to understanding how SRT interacts with living systems (Rubik, 2002; see pp. 703–717). Organisms actively respond to the endless flow of information from within and without. They continuously adapt their behavior by reorchestrating their self-organizing potential represented in the dynamic biofield, a life-organizing field within and surrounding the organism that informs and regulates all biochemical events. The organism, in turn, is informed by a myriad of component EM fields, laden with bioinformation, that arise from moving charged particles throughout the organism.

The biofield, with its flow of information-carrying energy, is thought to be responsible for the global properties of the organism that regulate homeodynamics (Rubik, 2002; see pp. 709–723). Organisms are subject to internal and external fluctuations or stressors, which affect homeodynamic processes making them unbalanced or altering their dynamic state; in popular terms, they are "under stress." It is possible that SRT interacts at the level of the biofield by reinforcing particular frequencies signifying key bioinformation that strengthens the organism's homeodynamic processes, thus, mitigating the stress response.

Presently, the precise engineering details of SRT are proprietary, a trade secret. Only a general description of SRT can, therefore, be provided here.

SRT is a technology that has been engineered to broadcast subtle energy and information bands of non-Hertzian (Rumsey, 1961; Zaghloul and Barajas, 1993) waves from solid-state devices. Both the hardware platforms and the subtle energy and information fields are proprietary. A master-field production machine powered by conventional electrical input activates these devices, which come in various types described herein. The output is the proprietary non-Hertzian fields generated by the proprietary frequencies. The key element of all SRT consumer and industrial application hardware is a resonating crystalline cell that emits subtle energy and information via non-Hertzian waves.

The inventors claim that the proprietary frequencies of SRT are identical to key frequencies in the biofield central to bioregulation. When a human or other organism is within the appropriate distance of an SRT device, the biofield achieves resonance with specific SRT frequencies. When resonance is achieved, it is proposed that the dynamic stability of the biofield is increased, thereby amplifying its effects on homeodynamic functional processes. For example, when the QLink device is placed over the sternum of the human body, the device facilitates information flow that is associated with homeodynamic processes that resist stress. In other words, the key frequencies in the biofield identical to those of SRT are strengthened by resonance, and the resulting bioinformation signal signified by these frequencies is increased. The resulting information transfer from the biofield to the human's biochemistry appropriately reduces the stress response. Thus, SRT functions homeodynamically to mitigate the stress response by enhancing the organism's ability to self-regulate under stress.

One may draw an analogy between SRT and being in a natural environment recognized as being conducive to health. A natural environment, which is off the power grid, contains natural geophysical frequencies such as the Schumann resonance (7.8 Hz), which corresponds to alpha rhythms in the human brain associated with meditation and the relaxation response. It is generally accepted that living in such a natural environment may result in increased health and vitality compared to living within the power grid. Living in crowded urban areas is fraught with many challenges to life, such as electropollution from power lines as well as the new wireless world of communication, chemical pollution, crime, and more. Urban living may be less supportive of the biofield, and hence, over time, associated with greater health challenges and even disease. By analogy, SRT acts to provide key frequencies as does the geophysical field to facilitate life processes. SRT may also conserve metabolic energy within organisms, by preventing them from reacting to stress inappropriately, thus increasing metabolic efficiency.

Five different devices with SRT resonators are presently marketed, the QLink Pendant; the QLink Ally, and three types of QLink ClearWave devices. It is thought that all of these devices interact with living systems by reinforcing the biofield and enhancing certain self-regulatory life processes as described above. All contain crystalline cells as the key functional components, which broadcast or emit the proprietary frequencies of SRT. 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: an oscillating crystalline cell; a tuning board; and an amplifying coil (Fig. 1.). The tuning board is placed near the oscillating cell, reinforcing it to oscillate at the desired specific frequency components, thereby protecting its function. The induction coil increases the amplitude of the SRT frequencies. QLink Pendants are worn over the sternum, suspended by a chain or cord, for up to 24 hours per day. It has been observed by many case studies that the QLink Pendant worn in this manner over the heart exhibits 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 (Oschman, 2000). 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 ClearWave devices (Fig. 2). Similar to the QLink Pendant, these are not made of traditional electrical circuit boards, but are designed to transmit SRT's proprietary frequencies that interact with the biofield in the same way. However in this case, the circuit boards use an electromagnetically powered oscillator to extend the influential range of the instrument over a greater distance.

The QLink Ally is an electrically powered portable device operating on a 9-V battery. The SRT-modulated electromagnetic fields are generated via an electronically active crystalline oscillator in the mega-Hertz range along with

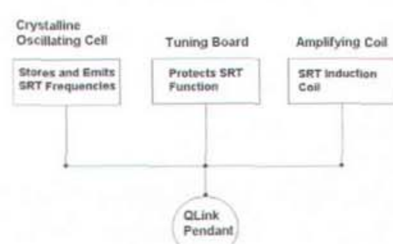


FIG. 1. Passive Sympathetic Resonance Technology™ (SRT) device components. QLink Pendant® device schematic of QLink Classic® and QLink Silver® (all manufactured by Clarus Products International, L.L.C., San Rafael, CA). The crystalline oscillating cell stores and emits SRT proprietary frequencies. The tuning board protects the functioning of the resonating cell by reinforcing the specific SRT frequency range. The amplifying coil consists of 75 feet of copper wire, which amplifies the specific frequencies emitted by the QLink.

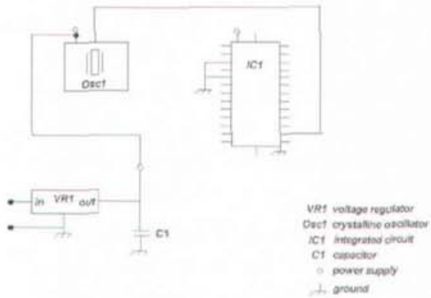


FIG. 2. Basic Sympathetic Resonance Technology™ (SRT) circuit configuration for the active devices. QLink Ally® and ClearWave® (both manufactured by Clarus Products International, L.L.C., San Rafael, CA). The crystalline oscillator emits the SRT proprietary frequencies and operates at the megaHZ range. Alternating current power is supplied to the circuit, extending the influential range of the active device. (Drawing, courtesy of Clarus Products International, L.L.C. ©2002. Used with permission.

other components as shown. The classic or Hertzian EM field of the oscillator acts as a carrier waveform for the modulated non-Hertzian signals of SRT. The field range of the QLink Ally is up to 12.2 m radially from the device.

The QLink ClearWave is an AC plug-in digital clock that works on the same principles as the QLink Ally. There are three different models of this device currently being marketed: the ClearWave 1, ClearWave 2, and ClearWave 3. These three models differ in the number of crystalline oscillators. Nonetheless, their basic working principles are the same. The field range of SRT is up to 9.1 m, 12.2 m, and 15.2 m radially for the ClearWave 1, ClearWave 2, and ClearWave 3, respectively. These stationary units are designed to be placed within the home or office environment to benefit humans and other life forms in that space.

In summary, it is proposed that SRT mitigates the impact of the stress response on organisms by acting on their biofields, information, and energy. First, resonance is achieved between the component frequencies of SRT and those of the organism's biofield. As a result, the biofield is strengthened, information flow to the biochemical processes ensues, and the self-regulating energy dynamics of the organism is improved. This results in the organism's enhanced resistance to stress.

The remainder of this paper presents the empirical data that show evidence of the biologic and clinical effects of SRT. These studies are organized according to the level of order in biologic systems to which the stressor applies: from the molecular level to that of the cell, tissue, organ, organ system, and whole organism.

BIOLOGIC AND CLINICAL STUDIES

Molecular stressor

The effects of SRT on stress tolerance of human cell cultures exposed to molecular stressors. In a study conducted by Wilhelm Mosgöeller, M.D., of the Institute for Cancer Research at the University of Vienna,† the QLink Ally was the form of SRT used. A single culture flask of cells was used in each experimental condition in a preliminary unblinded pilot study to measure the effect—if any—of SRT. The study investigated whether SRT conveyed a protective effect on cultured cells challenged with mytomycin C, a known chemical stressor and mutagen. This substance is well known for its mechanism of action to bind to DNA and increase the mutation rate and cell death (Pagano et al., 1999; Sengupta and Wasylyk, 2001; Subkhankulova et al., 2001; Vit et al., 2001).

Mitomycin C increases the DNA strand break frequency, a high frequency leading to cell death, during which process membrane permeability increases, allowing for the entry of Trypan blue that stains the cell. Intact cells resist the stain, so only dead cells are blue. Counting stained and unstained cells is a standard assay for cell viability.

Human fibroblasts from connective tissue and HeLa epithelial tumor cells (Brown et al., 1994) were the two types of human cells studied. The cells were incubated in culture for 24 hours under normal culture conditions with and without exposure to the 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 $\mu g/mL$ and incubating for another 24 hours, this time without the QLink Ally. After this, the cells

†Mosgöeller W. Stress tolerance effects of cells and tissue exposed to QLink Ally. Unpublished commissioned report to Clarus Products International, May 13, 2001.

were incubated with Trypan blue, and the percentage of dead cells was determined.

For both types of cells, four different cultures were measured once to assay four different conditions: (1) normally growing cells under standard laboratory conditions (no QLink Ally, no mitomycin C); (2) cells affected by chemical stress (no QLink Ally, mitomycin C); (3) Cells affected by QLink Ally alone (QLink Ally, no mitomycin C); (4) Cells preconditioned with QLink Ally followed by chemical stress (QLink Ally, mitomycin C).

The results on HeLa cells are shown in Table 2. The results for fibroblast cells are shown in Table 3.

The results show that there is no significant effect of the SRT on 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 as a result of the incubation in mitomycin C over the control culture ($p < 0.0001$). No significant difference was observed when QLink Ally conditioning of the HeLa cells was done prior to the chemical stress induced by mitomycin C.

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

The conclusions are as follows. The pretreatment of cell cultures with SRT showed a different effect on tumor cells (epithelial cancer) and normal cells (fibroblast). The normal cells were slightly better protected from subsequent chemical stress and cell death, whereas the tumor cells were not. This suggests a protective effect of SRT at the molecular level, which has implications about the possibility of alleviating the effects of chemical stressors such as mutagens on human health. This protective effect was observed for normal but not cancer cells. However, no strong conclusions can be made because this was only an initial pilot with a small number of samples and without sham controls.

The possible mechanism of action by which SRT may exert a protective effect on cells challenged with chemical mutagens is unknown. However, it has been speculated the frequencies of SRT may act directly on DNA as do certain low-level EM fields (Blank and Goodman, 1999). The 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 after the damage caused by mitomycin C. 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. Further cell culture studies are presently being conducted by Mosgöeller and colleagues to look for biochemical changes including stress-protein levels and calcium influx.

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	χ^2	Significance		
1–2	26.33	$p < 0.0001$		
1–3	0.3621	n.s.		
2–4	2.3646	n.s.		

Clarus Products, International, L.L.C., San Rafael, CA.
n.s., not significant.

TABLE 3. RESULTS FOR FIBROBLAST 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	χ^2	Significance		
1–2	50.973	$p < 0.0001$		
1–3	0.7097	n.s.		
2–4	4.968	$p < 0.05$		

Clarus Products, International, L.L.C., San Rafael, CA.
n.s., not significant.

Cellular stressors

Pilot studies on the effects of SRT on the transformation of Trypanosoma cruzi. Stuart M. Krassner, Ph.D., chair of the Department of Developmental and Cell Biology together with Barbara Granger at the University of California, Irvine, conducted blinded and controlled pilot studies on SRT‡§ using an organism that Krassner had studied over 15 years, *Trypanosoma cruzi* (Krassner et al., 1990). A quantitative bioassay, the *T. cruzi* Metacyclogenesis Assay was used. The purpose of this pilot study was to measure the effects of SRT on an *in vitro* model system for cell growth and differentiation (Krassner et al., 1991, 1993).

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 is a primary cause of heart disease in people under the age of 40 in Central and South America. The disease 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 SRT and compared to controls.

The experiment was conducted using two prototype experimental units supplied by the manufacturer. One was a device with SRT, and the other was a physically identical device without SRT signals, which served as a sham control. The experimenters were blinded as to the identity of the two devices until the study was completed and the data analyzed and reported. The codes were broken in the presence of an independent third party, Krishna K. Tewari of the Department of Biological Sciences, Molecular Biology, and Biochemistry, University of California, Irvine who provided written testimony that the data had already been analyzed and reported.

The experimental protocol was as follows. Noninfective *T. cruzi* cells (*in vitro* stage) were cultured in BHI medium (a nondefined growth-permitting medium) at 28–29°C after gassing with 5% CO_2 to initiate transformation to the infectious stage. The cell cultures were then introduced into the incubators with the SRT 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 at day 7 after gassing.

The experimental SRT generator unit, with dimensions 0.3 m × 0.04 m × 0.3 m was inserted into the incubator, which had internal dimensions of approximately 0.56 m × 0.46 m × 0.46 m.

‡Krassner SM, Granger B. Effect of voyager location on EMF influence upon the transformation of *Trypanosoma cruzi* to the infective stage for vertebrates. Unpublished report commissioned by Clarus Products International, LLC, San Rafael, CA December 22, 1993.

§Krassner SM, Granger B. Results of a blind study with programmed and unprogrammed biovoyager units with the *Trypanosoma cruzi* metacyclogenesis assay. Unpublished report commissioned by Clarus Products International, L.L.C., San Rafael, CA, March 9, 1994.

Each sham and experimental unit was used in a series of three experiments with four sample dish culture flasks, each containing 6×10^7 *T. cruzi* cells each.

The cell cultures were placed in four 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 three cell-culture samples was placed in each location. The experiments were repeated three times with the experimental unit and the sham unit to yield a sample size of nine in each case for each location. The culture dishes were continuously exposed to the devices in the incubator.

Any confounding parameters are controlled for in this study, because identical conditions were used for both the experimental cultures and sham control. The same experimental setup has been used for other research work previously completed by Krassner and colleagues (Krassner, 1990). The results are shown in Tables 4 and 5.

These results from Tables 4 and 5 show that metacyclogenesis was induced in cell culture, and that SRT, but not the sham control (Fig. 3), inhibited the conversion of the organism to the infectious form.

Furthermore, these data indicate that the transformation inhibition was apparently affected by the position of the cell cultures in the incubator with respect to the generator units. Those cultures positioned on the shelf above the generator unit or on a shelf below it were inhibited more than 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.

Separate control runs to test whether temperature or shelf material in the incubator might account for the differential results were conducted. Using bottles containing liquids of identical volume as the cultures, the temperatures of these were found to be unchanged, suggesting that differential temperature was not a factor in the results obtained. Another control run was made in which a Plexiglas shelf replaced the top metal shelf, and the active SRT generator unit yielded the same response patterns as found when all shelves within the incubator were metal. Therefore, neither temperature differential nor shelving material were involved in the effects observed that depended on relative position in the incubator.

Because as incubators are sources of nonuniform low-level EM fields associated with the power frequency and hence a source of electropollution, which is a known stressor as described earlier, it is possible that this nonuniform ambient EM field may interact

TABLE 4. RESULTS OF AVERAGE PERCENT TRANSFORMATION AFTER SEVEN DAYS FOR UNIT A—SHAM CONTROL

Unit A—Sham Unit				
Sample location	*Top shelf*	*Middle shelf*	*Bottom shelf*	*Negative control*
Mean	50.778	52.667	54.556	57.000
Standard Deviation	4.944	5.385	7.316	6.042
Sample Size	9	9	9	9
Paired *t* test				
Comparison of means				Significant at
Against control	*t* Stat		*p* value	0.05 level
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 SEVEN DAYS FOR UNIT B—SRT

	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
Standard 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

SRT, Sympathetic Resonance Technology™ (Clarus Products, International, L.L.C., San Rafael, CA).

differentially with SRT fields, which would explain the unusual effects observed in the sample incubated directly on top of the generator unit.

In conclusion, SRT produced a demonstrable biologic effect at the cellular level in the *T. cruzi* assay, inhibiting its transformation to an infectious form. This effect was also reproduced in three controlled experiments and with different generator units delivering SRT signals.

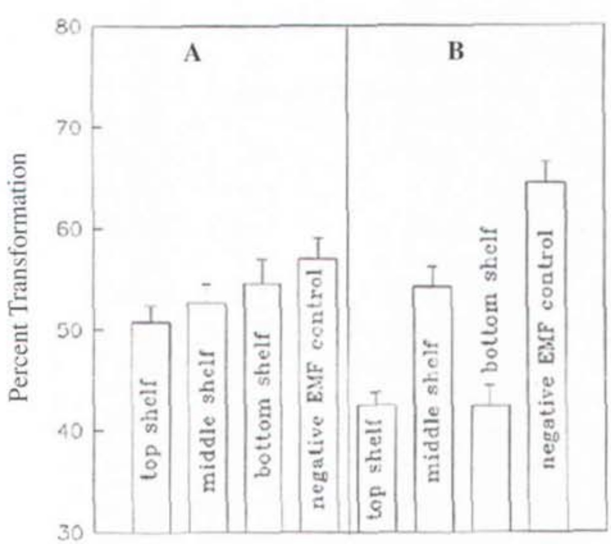


FIG. 3. Effects of sham unit (**A**) and active unit (**B**) on the **Trypanosoma cruzi** in vitro transformation after 7 days in incubator.

Preliminary study on the effects of SRT on the cell culture growth of human keratinocytes. Stuart M. Krassner at University of California, Irvine also performed a preliminary study on another cell system on his own that was previously unpublished. Cultured human keratinocytes were grown in the presence or absence of SRT to determine the effects, if any, on growth. In two experiments conducted by two 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 (Fig. 4).

The cell culture studies on *T. cruzi* and keratinocytes suggest that SRT can affect the growth and differentiation of eukaryotic cells in culture. Additional controlled studies with quantitative measures of growth and differentiation are recommended.

The effects on cell growth and differentiation may be mediated via a field interaction of SRT with the cellular biofield, as described by the biofield hypothesis (Rubik, 2002; see pp. 703–717). One possible mechanism is that SRT signals may interact with the cell membrane potential, which alters the calcium ion flux across the membrane, which initiates a cascade of biochemical signals that affect bioregulatory processes in the cell controlling growth and differentiation. In relation to this, extremely low-

FIG. 4. Growth of human keratinocytes (**A**) with Sympathetic Resonance Technology™ (SRT) and (**B**) without SRT.

frequency low-level EM fields have been shown to produce changes in calcium ion flux across cell membranes (Blackman, 1990). Further studies could be done to replicate the growth and differentiation effects with SRT while concomitantly measuring any changes in cellular uptake of radiolabelled calcium.

Tissue stressor

The effects of SRT as mediated by wearing a QLink Pendant on the blood and on the biological terrain. Live blood analysis (Bessis, 1973; Schwerdtle and Arnoul, 1990; Wintrobe, 1993) involves visual examination of freshly drawn capillary blood of subjects viewed using an optical microscope. It shows images of the various types of blood cells in their native state and plasma bodies as small as chylomicrons. This is a qualitative assessment of the biologic terrain (Bleker, 1993) of the body, which is the state of the extracellular fluid of the body with respect to pH, electrical conductivity, redox potential, the presence or absence of microbes in the blood, et cetera. The test requires either a dark-field or phase-contrast microscope (Henry, 1984) and a high contrast videocamera attached to it. The magnification with video enhancement and monitor projection is typically 20,000 × (total magnification = eyepiece power × objective power × digital magnification), so that a detailed view of live blood tissue is obtained, inaccessible by any other means. The size and shape of the blood cells, their morphologic stability over time, states of agglutination, the presence of fibrin, the presence of cell wall–deficient microbes (Mattman, 1993), and the motility of white blood cells are just some of the parameters observed. Normal healthy fasting blood shows free-floating round red blood cells interspersed with an occasional white blood cell, and clear plasma with only a few chylomicrons. There are many morphologic deviations (Bleker, 1993) from the normal state that have been empirically associated with nutritional, oxidative, pH, EM fields, and other stressors.

Dry-blood analysis, also called the oxidative stress test (OST) (Schwerdtle and Arnoul, 1990), is a procedure in which a droplet of freshly drawn capillary blood is left to sit for between 20 seconds and 1 minute on the fingertip from which it was drawn, and then pressed onto a glass microscope slide in eight sequential layers. It is then left uncovered to clot and dry. The resulting fibrin web is examined using a bright-field optical microscope under 10–20 × magnification, and the patterns noted. The accumulated clinical data over the past 70 years show empirically how the patterns formed relate to oxidative stress and other health issues. In particular, the presence of clear or whitish polymerized protein puddles (PPPs) 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 irregularities in color and form. Normal healthy blood produces a fibrin web that is continuous and without PPPs, and it appears a uniform pinkish-red.

These blood analyses are commonly used to assess the status of the biologic terrain and the patient's nutritional state. They are qualitative in scope and complementary to the quantitative blood testing of conventional medicine. Empirical data correlates the live and dry blood analyses with quantitative blood testing and clinical manifestations (Bleker, 1993). The tests are particularly useful for examining the effects of oxidative and other types of stress on the body at the cellular level, and are often done in tandem.

Live and dry-blood analyses with EM field challenge: uncontrolled pilot study. Robert O. Young, Ph.D., a microbiologist, conducted an initial uncontrolled open pilot study to observe the effects on SRT on human blood.‖ Three hypotheses were tested: (1) does 8-hour exposure to ambient low-level EM pollution 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 EM fields 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?

EM field exposures of subjects consisted of exposure to computer monitors and cell phones in the workplace. Typical exposure for office workers is 0.002 kV/m (electric field) and 2–3 mG (magnetic field) (Institute of Electrical and Electronics Engineers, 1992). Both live and dry-blood analyses of female subject volunteers, 20–30 years old, under the following experimental conditions were performed: (1) baseline: without known EM field stressors present; (2) EM field challenge: 8-hour exposure to ambient low-level EM fields in the workplace; and (3) EM field challenge while wearing a QLink Pendant: between 8- and 24-hour exposure per day for 3 days to low-level ambient EM field stress while knowingly wearing a QLink Pendant for 72 hours continuously. The subjects lived and worked in London, England, where they were exposed to electropollution 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 three experimental conditions as defined above:

‖Young RO. Live and dry blood analyses with EM field challenge. Unpublished report, 2001.

- *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 the EM field 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 the EM field challenge while wearing a QLink Pendant 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 Pendant.
- *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 the EM field 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 the EM field challenge while wearing a QLink Pendant 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 had better bowel elimination while wearing the QLink Pendant.
- *Subject III*—(1) Baseline testing showed blood cell disorganization with high levels of precipitated colloids in the live blood test (Fig. 5). The OST showed PPPs in the center of the clot, which are associated with cellular disturbance and the possibility of bowel congestion (Fig. 5B). (2) The results of the EM field challenge showed the same types of disturbances with red blood cell aggregation and stacking

in the live blood cell test (Fig. 6A). The OST showed even more PPPs than previously, indicating more severe tissue stress and congestion in the bowel (Fig. 6B). (3) The results of the EM field challenge while wearing a QLink Pendant showed little aggregation of red blood cells and a reduction in colloid deposits (Fig. 7A). The OST showed a normal pattern (Fig. 7B). The subject also reported feeling less stress, had fewer sugar cravings, and experiencing normal bowel elimination while wearing the QLink Pendant.

- *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 the EM field 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 EM field challenge while wearing a QLink Pendant 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 Pendant.

This small pilot study suggests: (1) the effects of stress from 8 hours of exposure to ambient low-level EM fields 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 changes seen in blood from exposure to electropollution 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 four of the subjects reported experiencing an increase in energy and less stress.

Live and dry-blood analyses with EM field challenge in controlled pilot study: eight subjects. In a subsequent study conducted by Young that was a double-blinded controlled trial,¶ 16 volunteer subjects were tested to examine two questions: (1) does the QLink Pendant show an improvement at the level of the biologic terrain and blood morphology as monitored via live and dry-blood analyses of subjects who were exposed to low-level ambient EM field 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 Pendant for 72 hours?

The 16 subjects (adult males and females ranging in age from 35 to 60) were randomly assigned into groups A or B, each group containing 8 subjects. Each individual in group A wore a sham device (control) and each in Group B wore an active QLink Pendant although this was not revealed until the end of the study. Both groups wore identical looking QLink-type pendants but only the pendants of experimental group, B had been activated. All 16 subjects were exposed to normal everyday EM pollution associated with computer monitors, cell phones, fluorescent lighting, 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 lifestyles except for wearing the pendants.

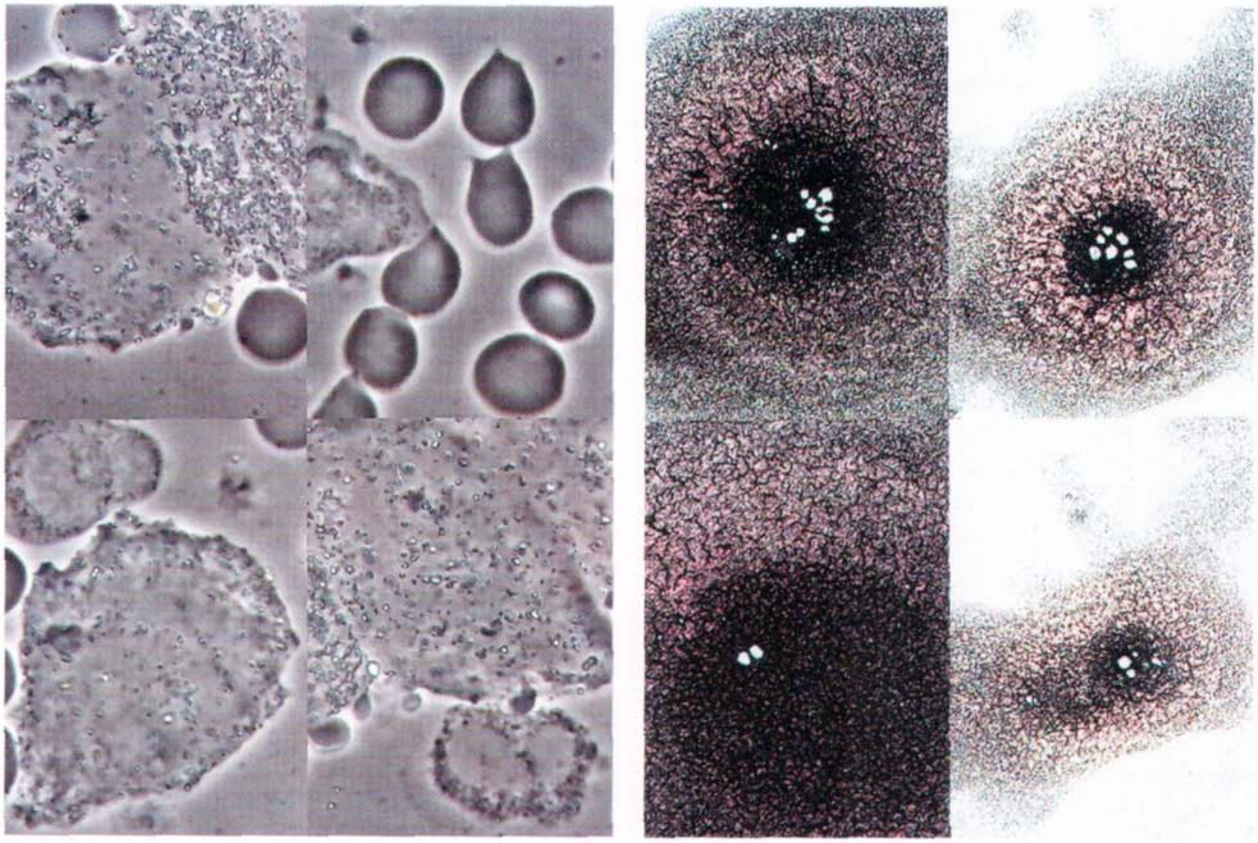
Live blood and dry blood (OST) analyses were conducted on each subject as follows: (1) control condition, before wearing the device; and (2) experimental condition, after wearing the device as a pendant for 3 full days, day and night. Blood was drawn from a finger prick and observed under a microscope as described previously. Blood cell images were recorded by microphotography.

The results are as follows for group A subjects:

- *Subject I*—(1) The control live blood test showed some morphologic disorganization in the red blood cells and the presence of cell wall–deficient microbial forms (Fig. 8A–B). The OST showed PPPs at center and off-cen-

¶Young RO. The negative effects of everyday lifestyle stressors including diet and EMF on the human cell and the QLink device to buffer lifestyle stress. Unpublished report commissioned by Clarus Products International, L.L.C., San Rafael, CA March 2002.

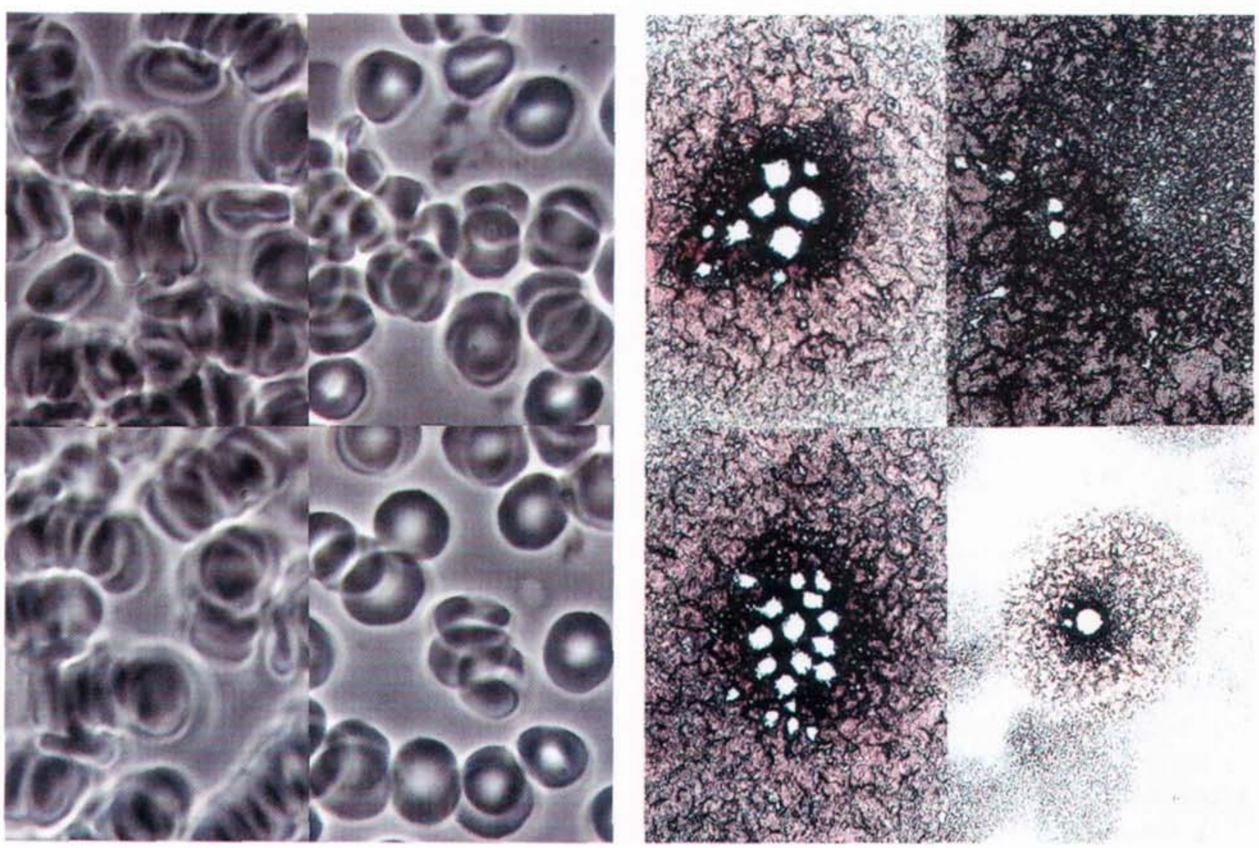
A



B

FIG. 5. Subject III—**A:** Photos of live blood cells from phase-contrast microscopy before electromagnetic field (EM) exposure (no QLink). **B:** Photos of dried blood before EM field exposure (no QLink).

A



B

FIG. 6. Subject III—**A:** Photos of live blood cells after electromagnetic field exposure (no QLink). **B:** Photos of dried blood after EM field exposure (no QLink)

ter in the blood clot associated with cellular disturbance and disorganization (Figs. 9A–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 (Fig. 8C). The OST showed a slightly different pattern than the control (Fig. 10A–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.

- *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*—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.

For group B subjects, the results were as follows:

- *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 pre-

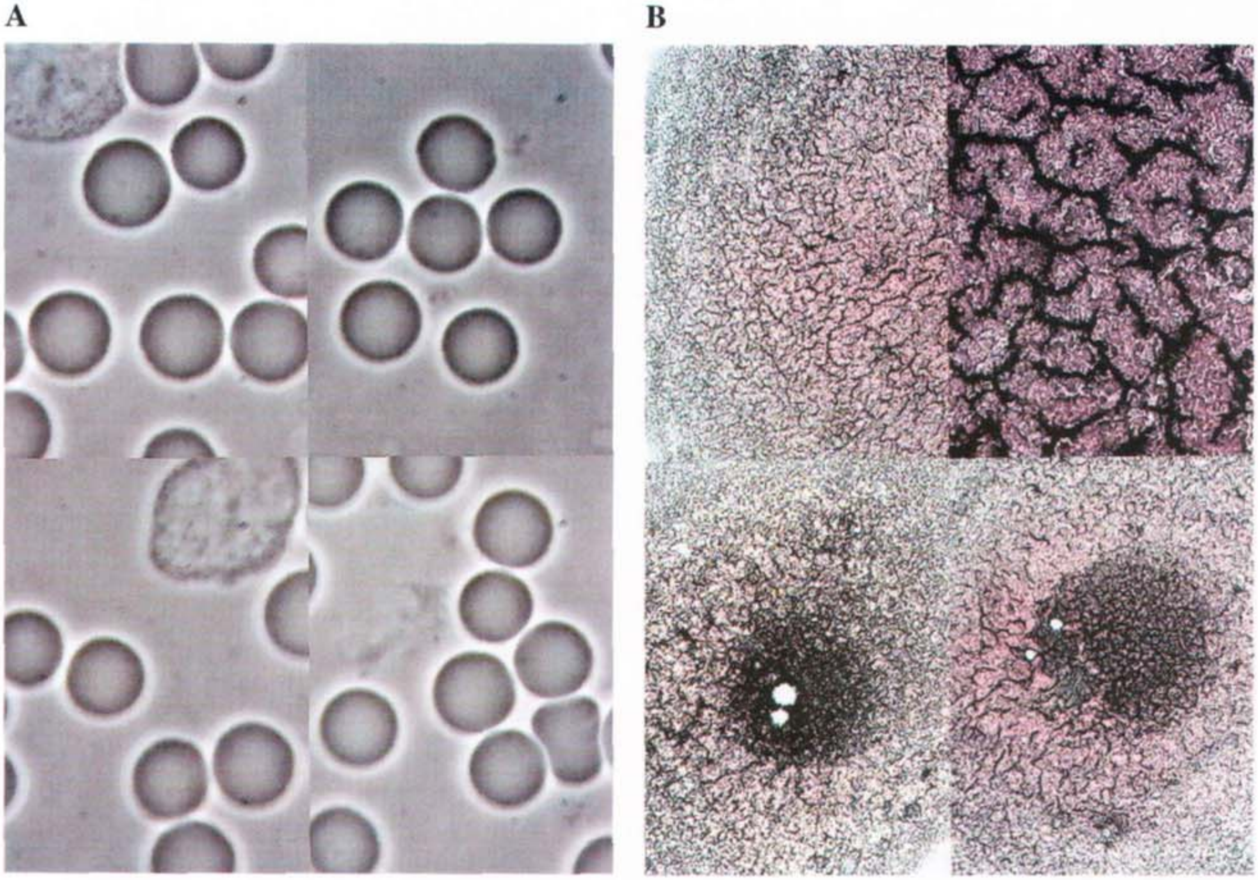


FIG. 7. Subject III—**A:** Photos of live blood cells with electromatic field (EM) field exposure (with QLink). **B:** Photos of dried blood with EM field exposure (with QLink).

cipitates 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 μm throughout the clot, indicating cellular disturbance and disorganization. (2) The experimental live blood test showed normal, round, free-flowing red blood cells, and no microbial forms present. The OST was more normal with

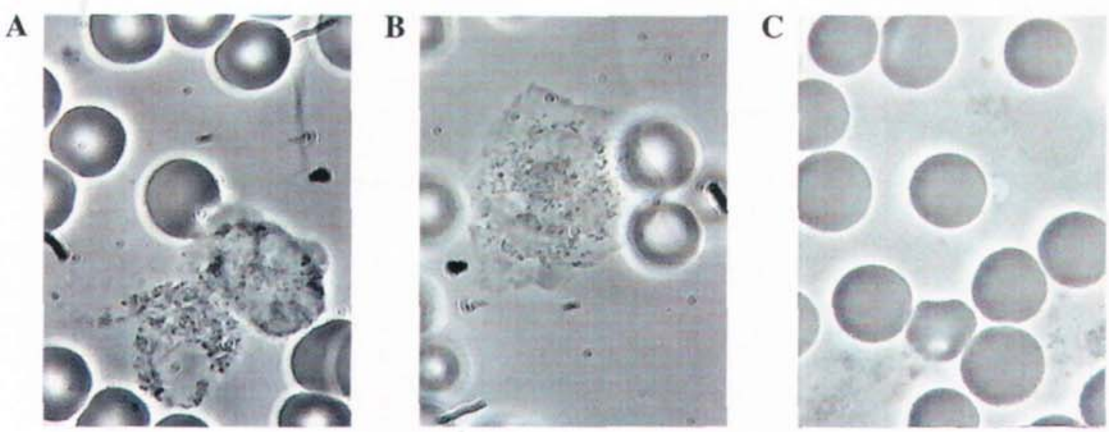


FIG. 8. Subject I, group A—Sham QLink device. **A** and **B**: Photos of control live blood cells without QLink A. **C:** Photo of live blood cells with QLink A. There were no apparent changes in the photos of the live blood cells between and the control and the sham QLink.

small and fewer PPPs. The subject reported an increase in energy, a reduction in lightheadedness, and no headaches after wearing the QLink-B pendant.

- *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 μm 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, round, 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 pendant.
- *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 (Fig. 11A). The OST showed several PPPs around 10 μm throughout the center of the clot that is associated with adrenal and psychologic stress as well as one large PPP at the center of the conglomerate which is associated with a challenge to the male reproductive system (Fig. 13). (2) The experimental live blood test revealed normal rounded red blood cells that appear separate and free-flowing, with no indication of microbial forms (Fig. 12A,B). The OST revealed a normal profile with no PPPs (Fig. 14A,B). The subject indicated that he experienced increased energy and less inflammation while wearing the QLink-B pendant.
- *Subject V*—(1) The control live blood test showed irregularly shaped red blood cells and some cell wall–deficient microbial forms in the plasma. The OST revealed a single 30-μm 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, round 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 μm. The subject reported that he felt no physical or psychologic difference while wearing the QLink-B pendant.
- *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 μm in the center of the clot, indicative of adrenal and psychologic 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, round 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 pendant.
- *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 psychologic 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 round 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 pendant.
- *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

A B

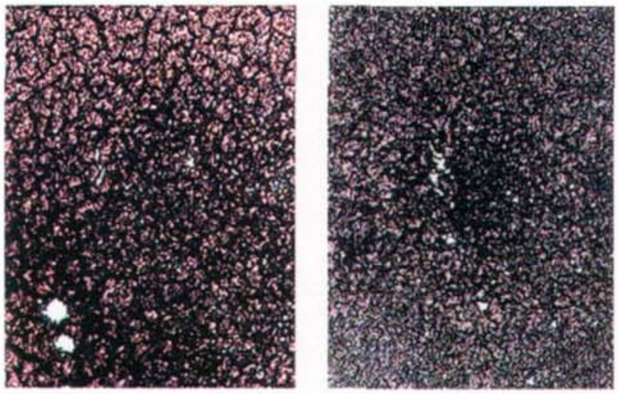


FIG. 9. Subject I, group A—Sham device. **A** and **B:** Photos of control dried blood without sham QLink.

A B

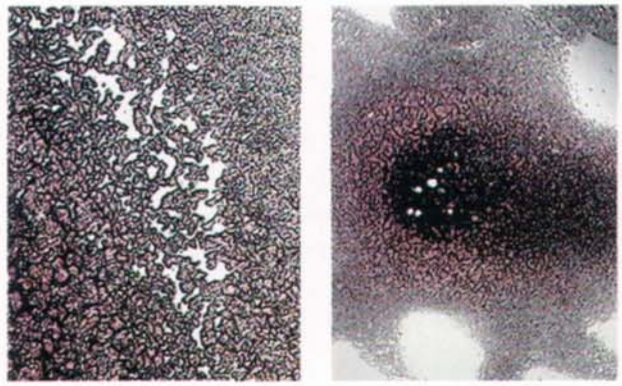


FIG. 10. Subject I, group A—Sham device. **A** and **B:** Photos of control dried blood with sham QLink after approximately 72 hours.

A B

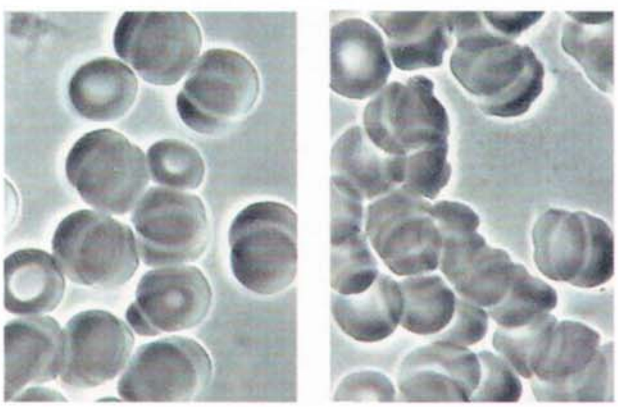


FIG. 11. Subject IV, group B—Active QLink. **A** and **B:** Photos of control live blood cells without QLink B.

A B

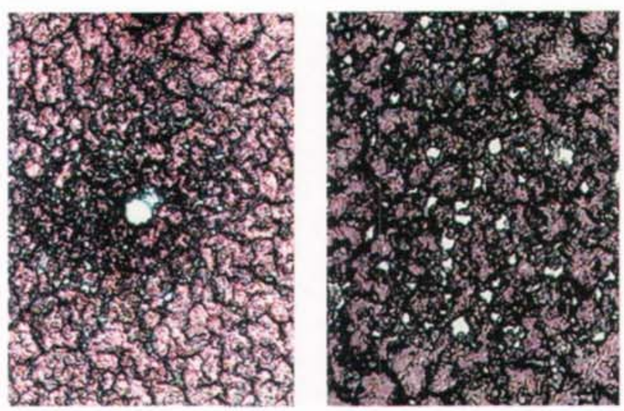


FIG. 12. Subject IV, group B—Active QLink. **A** and **B:** Photos of control dried blood without QLink B.

A B

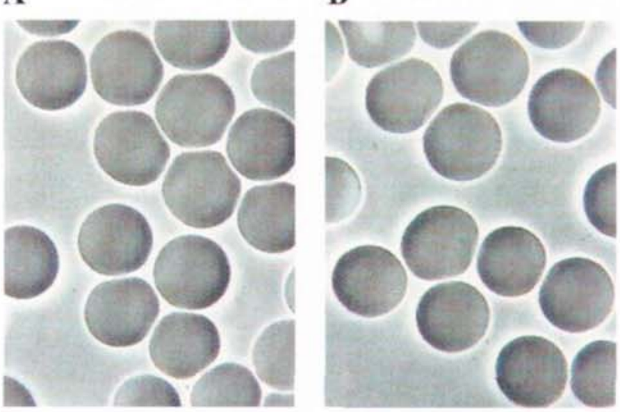


FIG. 13. Subject IV, group B—Active QLink. **A** and **B:** Photos of live blood cells with QLink B.

A B

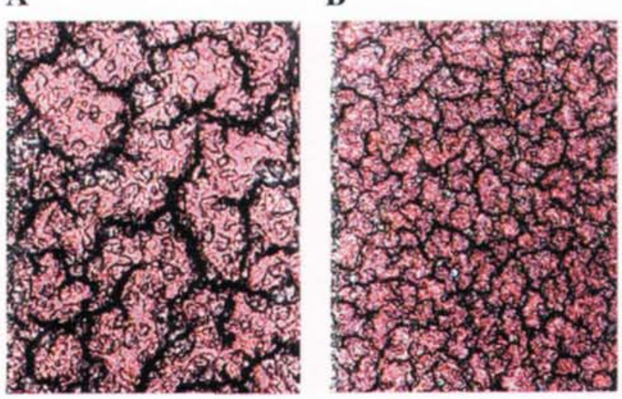


FIG. 14. Subject IV, group B—Active QLink. **A** and **B:** Photos of dried blood with QLink B.

microbial forms in the plasma. The OST revealed many PPPs ranging over 40 μm throughout the clot, which is associated with cellular disturbance and disorganization. (2) The experimental live blood test showed normal, round 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 results for all 16 subjects are summarized in Tables 6 (dry blood test) and 7 (live blood test).

This controlled double-blinded study suggests the following. In 8 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 Pendant for 72 hours. In addition, all 8 subjects wearing the sham device reported few or no significant improvements in energy level, well-being, or physiologic function. On the other hand, in 8 of 8 subjects in group B, there were differences in the results of the live and dry-blood tests before and after wearing the active QLink Pendant for 72 hours. After this time period of wearing the active QLink Pendant, the red blood cells as observed in live blood analysis appeared to be more normal in appearance and form, and without the tendency to aggregate or form stacks of cells. The number of microbial forms, colloidal deposits, and crystals observed in the plasma was reduced as shown in Table 7. 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, although the results from dry blood testing were less clear. In short, wearing the active QLink Pendant for 72 hours produced some improvements in the blood testing 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 biologic terrain caused by environmental toxicity, poor elimination of wastes, nutritional imbalances, and/or radiation toxicity, the results suggest that the QLink Pendant may help counteract such disturbances by improving the biologic terrain, that is, the extracellular fluid of the body that is the immediate environment of the cells. The results suggest that wearing the QLink Pendant helps maintain normal, free-flowing red blood cells and that the tendency for them to aggregate or stack together is reduced. In this regard, the QLink Pendant may act on the human biofield that helps maintain the normal electrical properties (net negative electrical charge) of the individual red blood cells. This would help them repel one another and avoid clumping as seen in live blood microscopy and presumably also in the bloodstream. Blood flow, especially in the microcapillaries, would hence be improved. Improving the microcirculation would lead to better nutritional delivery to the cells and tissues, better oxygenation, and better removal of wastes. All

TABLE 6. SUMMARY OF RESULTS OF DRY BLOOD TESTING ON 8 SUBJECTS IN SHAM CONTROL (A) AND 8 IN TREATMENT GROUP (B)

	Oxidative stress test results							
Subject:	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*
Group A: Placebo (7 males, 1 female)								
Pre	1, 2	2	1, 2	1, 2	1, 2	1	0	1, 2
Post	1, 2	2	1, 2	1, 2	1, 2	1	0	1, 2
Group B: Treatment (4 males, 4 females)								
Pre	1	1	1	1	1	1	1, 2	1
Post	1	1	0	0	1	1	1	1

where 1 = PPPs present; 2 = dark clot in center; 0 = normal profile.
The results suggest a slight tendency for a more normal profile in group B.
PPS, polymerized protein puddles.

TABLE 7. SUMMARY OF RESULTS OF LIVE BLOOD TESTING ON 8 SUBJECTS IN SHAM CONTROL (A) AND EIGHT IN TREATMENT GROUP (B)

	Live blood analysis results							
Subject:	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*	*VIII*
Group A: Placebo (7 males, 1 female)								
Pre	4	3	3, 6	3	3, 6	1, 4, 5	3	3
Post	4	3, 6	3, 6	3	3, 6	1, 4, 5	3	3
Group B: Treatment (4 males, 4 females)								
Pre	1	1, 4, 5, 6	1, 4, 6, 7	1, 2, 4	1, 4	1, 2, 3, 4, 5	1, 3, 4	1, 2, 3, 4
Post	0	0	0	0	0	0	0	0

where 1 = Irregular RBC shape; 2 = RBC agglutination; 3 = RBC stacking; 4 = Cell-wall–deficient microbial forms; 5 = Colloid deposits; 6 = Crystals; 7 = Platelet aggregation; 0 = Normal Profile.
RBC, red blood cells.

these enhancements would lead to an improved biological terrain. This is only one possible speculation, however, on how the QLink Pendant may act to produce the results observed in this study.

This study is weak in that it uses only a single qualitative assessment of biologic terrain, the microphotography of blood, which is limited. More conventional and quantitative measures of biologic terrain include the redox potential, electrical resistivity, and pH of blood, urine, and saliva. These could be used in a subsequent study to test whether SRT is affecting the biologic terrain. The concomitant testing of blood, urine, and saliva both qualitatively and quantitatively would constitute a meaningful assessment of biologic terrain assessment (BTA) (Kemeny, 1953) as it is used in the clinic. A 6 month double-blinded study is currently in progress using quantitative chemical analysis of blood.

Organ stressor

A double-blinded controlled pilot study on the effects of QLink Pendant on human EEG responses. A wide variety of different biologic effects from applied EM fields on the human central nervous system have been observed, and these differences can be attributed to the variation in the field exposure parameters and differences in experimental design (Rubik, et al., 1994). For example, the duration of exposure to applied EM fields influences the electroencephalogram (EEG), with transient (on and off) exposures producing the most pronounced changes (Tyler, 1990). In this study, the EEGs of humans are measured and analyzed both qualitatively and quantitatively to ascertain the effects of applied EM 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 QLinks; (no components, i.e., no tuning board, copper coil, or resonating cell, and no SRT present) (2) inactive QLinks (all components present, but no SRT activity) and (3) active QLinks (all components present, with active SRT). The study is a double-blinded controlled trial with crossover 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 (Shealy et al., 1998).

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

A code was randomly assigned to the three groups of QLink Pendants that were tested, and this code remained unknown 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 receive two different treatments. Each treatment lasted 1 month and concluded in an EEG session that lasted approximately 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 examination table prior to the EEG session. In addition, a folded towel was placed on their chest to ensure 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 EM 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 1 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 1 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 two pretreatments with the placebo pendant, 6 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 two post-treatment results for the placebo pendant, this result is 11 of 18 or 61%. Therefore, wearing the placebo for 1 month appeared to condition it in a positive way.

The data also show essentially the same results for the inactive and active QLink Pendants. 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 versus 0.33; $Z = 2.3$; $p < 0.01$).

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

The results of this study show that the active QLink Pendant stabilizes the EEG in the presence of transient low-level EM stressors and suggest that it provides protection from stress. It might be particularly beneficial for extremely sensitive persons who experience clinical symptoms with such exposure. However, the similar results obtained with the inactive and active QLink Pendants raise questions about the methodology used here. It suggests the possibility that the components in the particular configuration of the QLink Pendant device may have some activity even without activation. It is also possible that subjects in different groups interacted in some way during the trial unknown to the researchers that may have con-

TABLE 8. PROTECTIVE EFFECTS OF THE QLINK PENDANT™[a] VS. PLACEBO

	Positive	*Negative*	*Total*
1. First pretreatment			
Active	12	8	20
Placebo	6	12	18
Inactive	11	9	20
2. First pretreatment			
Active	3	6	9
Placebo	7	2	9
Inactive	5	5	10
3. Second pretreatment			
Active	5	5	10
Placebo	2	6	8
Inactive	6	4	10
4. Second postreatment			
Active	7	2	9
Placebo	4	5	9
Inactive	6	3	9

Active = SRT; Placebo = sham device with incomplete configuration; Inactive = device with complete configuration but without activation.

[a]Clarus Products International, L.L.C., San Rafael, CA.

SRT, Sympathetic Resonance Technology™ (Clarus Products).

tributed to overlapping fields having some influence on the outcome. Other confounding influences are also possible. The study is also limited in that small numbers of subjects were measured. 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 Pendant on muscle weakness and other chronic symptoms attributed to EM pollution. Applied kinesiology (AK) purports to determine health imbalances in the body by identifying weaknesses in specific muscles (Klinkoski and Leboeuf, 1990; Walther, 1988). By stimulating or relaxing these key muscles, an applied kinesiologist purportedly 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 (Goodheart, 1989). In a preliminary study, Robert M. Blaich, D.C., a leading expert in AK in private practice, used AK to investigate muscle weakness patterns in QLink Pendant wearers.** AK was used to test relative muscle strength to identify changes in muscle facilitation–inhibition patterns caused by interactions with the environment, to assess the effects on subjects of external stressors including EM fields. The strengthening of weak muscles while wearing the QLink Pendant was consistently observed. Furthermore, it was observed that the QLink Pendant also diminished muscle weakness when the subject was exposed to EM stress (preliminary data not shown).

A controlled double-blinded pilot study was then designed and conducted by Eric Pierotti, D.C., in private practice, to ascertain whether wearing a QLink Pendant could negate the muscle weakness related to the acupuncture meridian system exacerbated by EM stressors.†† The following questions were addressed: (1) can wearing a QLink Pendant reduce the specific muscle weakness exacerbated by EM stressors in the immediate environment? (2) Can wearing a QLink Pendant for 4 months reduce patients' symptoms to chronic EM stressors? (3) What are patients' self-reports of their health and well-being after wearing QLink Pendants for 4 months?

Twenty (20) patients undergoing AK treatment were selected for having a variety of physical symptoms (Table 9) associated with chronic EM field sensitivity (i.e., having chronic symptoms such as headaches, back pain, allergies, chronic muscle tension, among other symptoms as shown). Furthermore, these selected patients also displayed recurrent muscle weakness related to the acupuncture meridian system, namely, therapy localization (TL) to the pulse points (Walther et al., 1988). TL is a phenomenon in which muscle facilitation or inhibition of a patient's muscle, 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).

The subjects were divided into the following five groups according to their ongoing exposure to various EM field sources. (1) computers (more than 3 hours per day exposure): 10 patients (7 females, 3 males); (2) industrial hairdryers: 3 patients (2 females, 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.

All 20 patients were initially screened for

TABLE 9. PATIENTS' CHRONIC SYMPTOMS AND COMPLAINTS THAT ARE ASSOCIATED WITH CHRONIC EM FIELD SENSITIVITY

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

EM, electromagnetic.

**Blaich RM. Therapeutic effect of the Clarus QLink Pendant. Unpublished report commissioned by Clarus Products International, L.L.C., San Rafael, CA August 15, 1997.

††Pierotti E. Efficacy of Clarus QLink with muscle weakness(es) attributed to EMF emissions. Unpublished report commissioned by Clarus Products International, L.L.C., San Rafael, CA May 20, 1998.

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 EM field source. Twenty (20) of 20 exhibited bilateral mid-deltoid weakness when tested seated at a computer.

The subjects were then retested using two different QLink Pendants: an active unit and a control or sham unit. These were placed in separate black string tie-bags to conceal their identity and handled by a third party, who placed them around the necks of subjects. The retesting with QLink Pendants addressed the following: (1) negation of the mid-deltoid weakness while exposed to a specific EM field source; (2) change in the strength of the muscles previously found to be weak that are associated with the acupuncture meridian system; and (3) change in the strength of muscles randomly found weak.

According to their muscle responses, 17 of 20 subjects received the active unit to wear for the duration of the study, although they did not know at that time that the active units were the ones that provided the strengthened muscle response. The results indicate that 17 of 20 subjects (85%) had a marked increase in muscle strength while exposed to an EM field source while wearing the active QLink Pendant. Moreover, these same 17 of 20 continued to have muscle weakness when wearing the sham QLink Pendant. Only 1 subject showed a change with the sham pendant, and 2 subjects showed changes to both sham and active pendants.

All subjects were treated for their symptoms using standard AK protocols and chiropractic techniques. The muscle weakness associated with the acupuncture meridian system was treated using tapping techniques and acuaids (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 Pendant (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 in 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.

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

The findings are summarized as follows. (1) A controlled double-blinded experiment using a sham control and an active QLink Pendant showed that the active QLink Pendant but not the sham improves muscle strength in EM-field–sensitive subjects who show patterns of muscle weakness when exposed to EM field sources. (2) Wearing the active QLink Pendant for 4 months while receiving chiropractic and AK therapy reduces patients' symptoms due to chronic EM stressors. (3) Patients reported improved psychologic functions after long-term wearing of the QLink Pendant.

The results suggest that the QLink Pendant improves muscle strength in the presence of EM stressors. However, exactly what caused the long-term chronic conditions to improve is unclear. Multiple therapies were used, including AK therapy and chiropractic adjustments, at the same time the subjects were also wearing QLink Pendants or sham devices. Therefore, no definitive role for the QLink Pendants in the mitigation of symptoms is known. Because these patients were chronic sufferers, the results suggest some contributing role from the

QLink Pendants. No statistical measures or levels of confidence were drawn from these studies, which involved small numbers of patients.

Organ system stressor

Effects of the QLink Pendant on Electrical Resistance of Acupuncture Points and Associated Meridian Stress. Tyteeka Reye, N.D., D.Sc.F., in private practice in Denver, CO, conducted an initial controlled pilot study to assess the effects of wearing the QLink Pendant on skin conductivity when subjects were exposed to EM stressors associated with household electrical appliances. The method used 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 and wrote a report.‡‡

Practitioners can measure the stress associated with the acupuncture meridians by introducing a low-voltage electrical current at various acupuncture points and measuring the level of electrical current conducted through them. This diagnostic method is based on the work of the German physician, R. Voll, who discovered in the 1950s that certain acupuncture points showed abnormal readings of electrical conductivity when subjects were strongly reacting to a stressor, such as an allergen, placed nearby their body (Voll, 1975). Motoyama has demonstrated that 70% of this so-called skin conductance is associated with the internal body, and only 30% is caused by the skin itself (Motoyama, 1997). Further studies of these phenomena and the various devices used to test skin resistance have also been performed by William Tiller, Ph.D., while at Stanford University, Stanford, CA (Tiller, 1987).

Despite extensive scientific research, there is no clear understanding of this type of measurement, its perturbation by external agents, or its use as a diagnostic in medicine. In relation to this, the Office of Technology Assessment of the U.S. 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 (Office of Technology Assessment, 1978). In any case the Voll method has become the basis of a diagnostic assessment in worldwide usage known as EAV (Electroacupuncture According to Voll) (Voll, 1974), variously referred to as electrodermal testing and meridian stress assessment (MSA). There are a variety of different electrodermal testing devices on the global market, and some of these are Food and Drug Administration (FDA) approved for MSA 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 V 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, its reciprocal value, with a scale from 0 to 100, representing a conductivity range from 0.5 μmho/cm^2 to 200 μmho/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.

Twenty-two (22) adults (6 males and 16 females) were enrolled in the trial and randomly assigned to three test groups: (1) 13 subjects with 3 males and 10 females, three test conditions (baseline measurement and exposure to an electrical facial muscle stimulator [an applied EM stressor] with and without the use of the QLink Pendant); (2) 5 subjects, 2 males and

‡‡Kundi M. Study on the change in skin resistance of a person exposed to stress with and without the use of the QLink pendant. Unpublished report commissioned by Clarus Products, International L.L.C., San Rafael, CA, and PHG (SRT distributor), December 26, 2000.

3 females, with 3 test conditions (baseline measurement and exposure to an electric hairdryer [an applied EM stressor] with and without the use of the QLink Pendant); (3) 4 subjects, of 1 male and 3 females, with 2 test conditions (baseline measurement and the QLink Pendant without any applied stressors).

The QLink Pendant was not worn for more than 2 minutes before the person was exposed to the applied EM stressor, either the electric facial muscle stimulator or the electric hairdryer, both of which operated on 60 Hz AC. One of these devices was switched on and placed in the lap of the test person during the applied EM stressor condition.

Before analyzing the data, the distribution function with respect to skin resistance was inspected. Despite the fact that values varied 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 (standard error of the mean [SEM]) 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 μmho/cm^2); values ranging from 40 to 50 (approximately 10 μmho/cm^2); values ranging from 50 to 55 (approximately 14 μmho/cm^2); values ranging from 55 to 65 (approximately 26 μmho/cm^2); and values of 65 and above. For each person and test condition, the number of test points out of 40 within these five 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 Honestly Significant Difference (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 15–17 for the profiles of means of groups A–C, respectively, and the three test conditions. Figure 18 shows the profiles of the means for groups A and B taken together for all test points and test conditions.

Most of the test points showed an increase in the GSR compared to the baseline measurements when the subject was exposed to the EM stressor. This was observed for both group A and B. If the QLink Pendant was worn at the same time that the EM stressor was applied, the conductivity of the test points were reduced toward normal values.

Group 3 showed a normalizing effect when the QLink Pendant was worn. That is, low baseline values were increased, and high baseline values were reduced while wearing the QLink Pendant. Thus, an increased number of values were observed to fall in the normal range. These effects are shown in Figures 19–21. The figures show the average of measured values within the different categories.

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.

Significantly fewer subjects exposed to an applied EM stressor show normal values be-

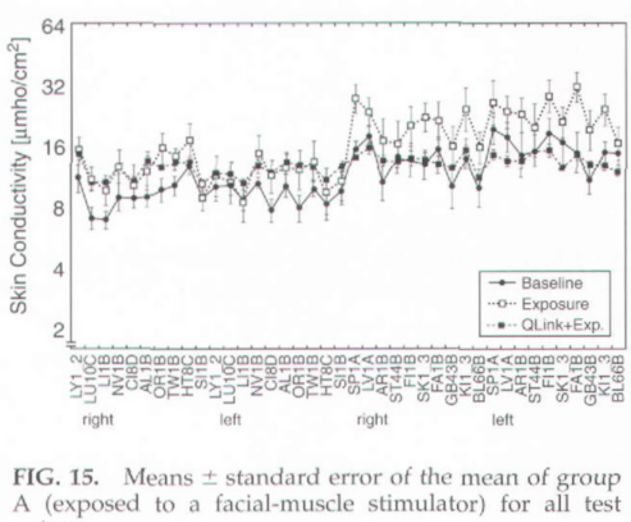


FIG. 15. Means ± standard error of the mean of group A (exposed to a facial-muscle stimulator) for all test points.

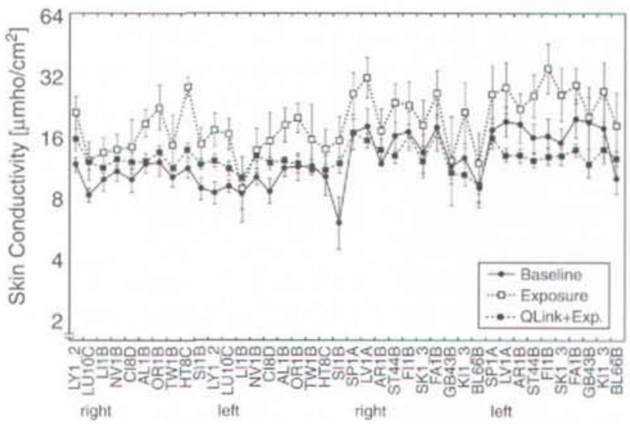


FIG. 16. Means ± standard error of the mean of group B (exposed to a hair dryer) for all test points and test conditions.

tween 50–55, which are optimal. This effect is reversed when the QLink Pendant is worn. A significantly higher proportion of subjects show normal values while wearing the QLink Pendant 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 EM stressor than at the time of baseline measurement. If the QLink Pendant is worn during this EM field exposure, this difference is not seen.

The results for group 2 are similar to those for group A. Table 11 shows the statistical test results.

In Table 11, the univariate analysis of variance for group 2 is shown. The difference between individual test conditions is tested. The last column shows the results of Tukey HSD test, which compares the individual conditions of baseline, EM field exposure, and QLink Pendant during EM field 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 Pendant.

A comparison of the baseline measurement and the use of the QLink Pendant without exposure to an applied EM 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 (Table 12).

Because this was a pilot study, neither the sequence of the tests was varied nor was the study blinded.

In summary, the results are as follows. Wearing the QLink Pendant without exposure to applied EM stressors led to an increase in the number of measurements in the normal range (scale values 50–55). On exposure to applied EM stressors, the skin conductivity was increased at almost all test points. This increase results in a significant increase in the number of measurements above the normal range, signifying an inflammatory reaction. The use of the QLink Pendant while exposed to applied EM 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.

The results of this study suggests that the QLink Pendant has a normalizing or regulating effect on the acupuncture system, whether there is an applied EM field challenge or not. It is proposed that the SRT frequencies from the QLink Pendant interact directly with the elements of the acupuncture system, which have been proposed to be components of the biofield (Rubik, 2002; see pp. 703–717). By strengthening key components of the biofield, homeodynamic processes that govern bioregulation are enhanced, producing a normalizing effect with greater resistance to stressors.

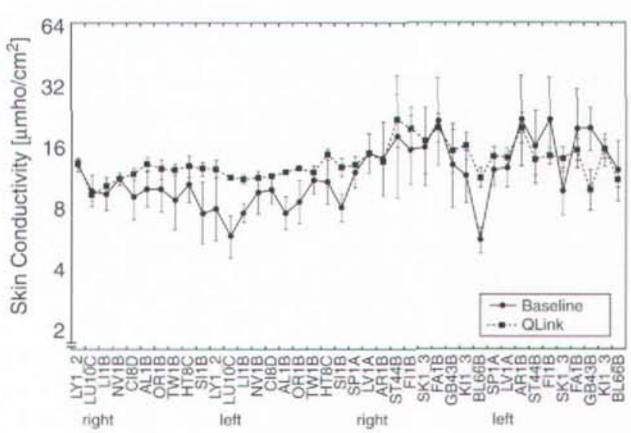


FIG. 17. Means ± standard error of the mean of group C (no exposure to electronic devices) for all test points and test conditions.

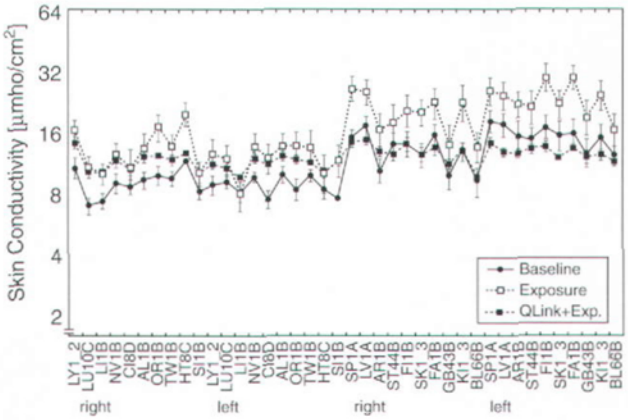


FIG. 18. Means ± standard error of the mean of groups A plus B (exposed to both electronic devices) for all test points and test conditions.

This controlled study was not blinded, nor was the sequence of the tests varied. A greater number of subjects would have made it more conclusive. A more comprehensive 100-subject double-blinded study on the effects of SRT on the acupuncture system is presently being conducted by Christian Thuile of the International Center of Energetic Medicine in conjunction with the University of Vienna.

Behavioral stressors

Effects of SRT on children with learning disabilities under EM stressors. A 1-month blinded controlled study was conducted by Evelyn Wiseman, Educational Director, New Way School in Scottsdale, AZ.[§§] This is a small private school approved by the Arizona State Department of Special Education for children with learning disabilities, attention deficit disorder, and underachievement. The teacher-to-student ratio is 8:1, and the total student enrollment is 140 or less. 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.

Fifty-two (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 there are computers in each classroom as well as fluorescent lighting, creating EM stressors throughout the building.

Two different devices were used in the study: the QLink ClearWave with active SRT (group A), and a placebo unit (group B), in an alternating fashion each week as follows. At the beginning of the first week, group A units were placed throughout the school. At the beginning of the second week, group B units replaced them. During the third week, group A units were used once again, and in the fourth week, group B 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 daily for several months 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. The teachers did not know which unit was the active or sham unit throughout the

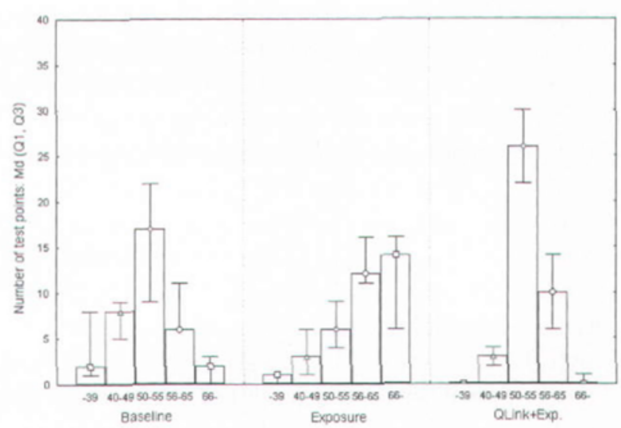


FIG. 19. Medians (and first and third quartile) of the number of measured values (of 40) per person and test condition within the different categories of measured values for group A (exposed to a facial-muscle stimulator). Values within category 50–55 are considered to be balanced.

[§§]Wiseman E. Neutralizing the negative effects of electromagnetic fields (EMF): impact on learning disabilities at the New Way School. Unpublished report, Spring, 1993.

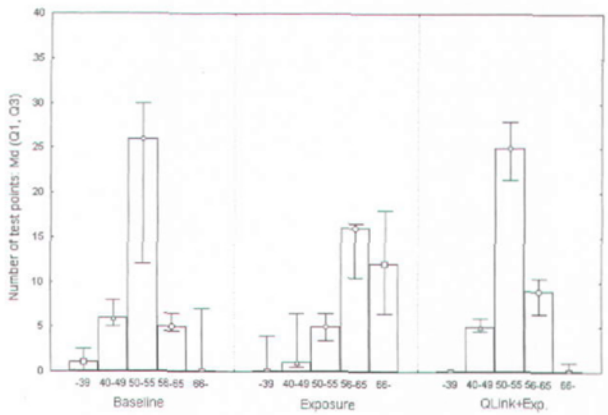


FIG. 20. Medians (and first and third quartile) of the number of measured values (of 40) per person and test condition within the different categories of measured values for group B (exposed to a hair dryer). Values within category 50–55 are considered to be balanced.

study. 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.

The results show significant decreases in behavioral problems in all four criteria under group A, active SRT. 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%.

The results from this blinded, controlled study suggest that SRT has positive effects on behavior in learning-disabled children exposed to EM stressors. However, these data are preliminary because of the limited duration of the study and the small number of participants. Further studies are suggested to test the long-term effects on a larger number of children.

Positive effects on anxiety levels of students in a public school. A controlled double-blinded study was conducted by David Aaron Eichler, a doctoral student at Holos University in Springfield, MO, which constitutes his doctoral dissertation.[‖‖] The research question tested is: does active SRT placed in the classroom in which ambient EM stressors exist (from computers and other educational devices) influence the anxiety test scores of sixth graders? The instrument used is the State-Trait Anxiety Inventory for Children (Spielberger, 1973), 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.

One hundred and eighty-four (184) subjects were included, 93 male and 91 female students from eight classes of sixth grade students, average age, 12 years, at a public middle school in northeast Kansas. They were divided into groups A and B. In group A, the students remained with a single teacher for all five core subjects, while in group B, the students rotated for these subjects among four teachers. Subject criteria included the completion of baseline survey and intervention forms. Ninety-one (91)

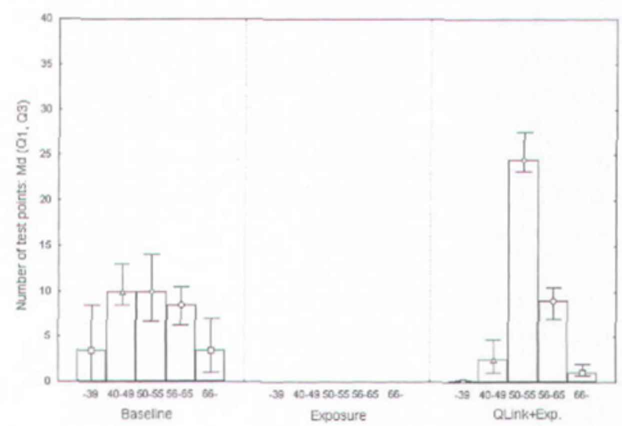


FIG. 21. Medians (and first and third quartile) of the number of measured values (of 40) per person and test condition within the different categories of measured values for group C (no exposure to electronic devices). Values within category 50–55 are considered to be balanced.

[‖‖]Eichler DA. Examination of a Subtle Energy Device on Anxiety Levels of Students in a Public School Setting: The Clarus QLink ClearWave [dissertation]. Springfield, MO: Holos University; March 15, 2001.

TABLE 10. STATISTICAL RESULTS FOR UNIVARIATE ANALYSIS OF VARIANCE FOR GROUP A

Variable	*Test size*	df1/df2	p *value*	Post hoc *comparison* (p < *0.05)*
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 and up	17.82986		0.0000	B-E E-Q

where B, baseline; E, EMF exposure; Q, QLink + EMF exposure.
EMF, electromagnetic field.
Clarus Products International, L.L.C., San Rafael, CA.

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 EM fields in the classroom. The classrooms constituting groups A and B were separated from one another by approximately 76 feet, so that SRT used in one classroom would not be influencing the other.

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

After these baseline measurements and various surveys being completed by the students, QLink ClearWave devices, active (containing SRT) and sham controls, were plugged into each classroom. Subjects were exposed to SRT only during the times in which they were in one of their core classes, approximately 5 hours each school day. The entire study was 9 weeks' duration.

The numerical results of anxiety testing are shown in Figures 22 and 23.

The results were analyzed via *t* tests. A between-subject treatment effect ($p = 0.059$) indicated a trend for state-anxiety scores between treatment and control groups. No such trend was observed for trait-anxiety scores ($p = 0.782$). Thus, a statistical difference between the control and treatment groups for state-anxiety scores is at the 94% confidence level, which is a trend that is not quite statistically significant, as $p > 0.05$.

The data indicate a trend that state-anxiety is reduced in the group experiencing SRT. The basis for this observed trend is probably caused by active SRT, which is proposed to strengthen the human biofield when the SRT from QLink ClearWave is placed in the vicinity of the user, protecting from the effects of EM stressors. In this study, the ambient EM stressor was relatively low at 1 mG or less for the student exposure, which nonetheless may have had an impact on the state anxiety scores.

While state-anxiety score differences showed a differential trend between control and treat-

TABLE 11. STATISTICAL RESULTS FOR UNIVARIATE ANALYSIS OF VARIANCE FOR GROUP B

Variable	*Test size*	df1/df2	p *value*	Post hoc *comparison* (p < *0.05)*
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 and up	9.76914		0.0030	B-E E-Q

B, baseline; E, EMF exposure; Q, QLink + EMF exposure.
Clarus Products International, L.L.C., San Rafael, CA.

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 and up	4.373494		0.1276

ment groups, no qualitative data were gathered in this study that might reveal the subjects' subjective impressions of their environment. Moreover, no correlation between subjective impressions and state-anxiety scores had been published.

This study has implications for the classroom and beyond. Reduction in anxiety in the classroom through SRT might help students concentrate and achieve new learning. It might help those with performance anxiety during examinations. it may also mitigate feelings of frustration, hostility, depression, frustration, isolation, et cetera, that are associated with acts of violence in schools.

The main limitation of this study is its short duration. Further studies using SRT in the classroom would be worthwhile to assess its long-term effects on mood and other psychologic states, behavior, 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 ap-

TABLE 13. IMPACT OF SRT ON STUDENTS WITH LEARNING DISABILITIES EXPOSED TO EM STRESSORS AT NEW WAY SCHOOL, SCOTTSDALE, ARIZONA

"Maladaptive Behaviour Event" Criteria	*GROUP "A" (Active Unit with SRT)*	*GROUP "B" (Placebo Units)*	*% DIFFERENCE SRT vs Placebo*
Academic criteria			
Not on task	67	128	−48%
Trouble following directions	65	132	−51%
Work not completed	22	42	−48%
Academic Criteria Totals	154	302	−49%
Emotional criteria			
Irritability	37	61	−39%
Outbursts	23	55	−58%
Withdrawn	15	17	−12%
Emotional Criteria Totals	75	133	−44%
Social criteria			
Problems Interacting with peers	43	41	5%
Problems Interacting with staff	20	27	−26%
Social Criteria Totals	63	68	−7%
Physical criteria			
Hyperactivity	60	79	−24%
Headaches	17	18	−6%
Fatigue	36	49	−27%
Physical Criteria Totals	113	146	−23%
Total reduction in all "maladaptive behaviors"	405	649	−38%

SRT, Sympathetic Resonance Technology™ (Clarus Products International, L.L.C., San Rafael, CA); EM, electromagnetic.

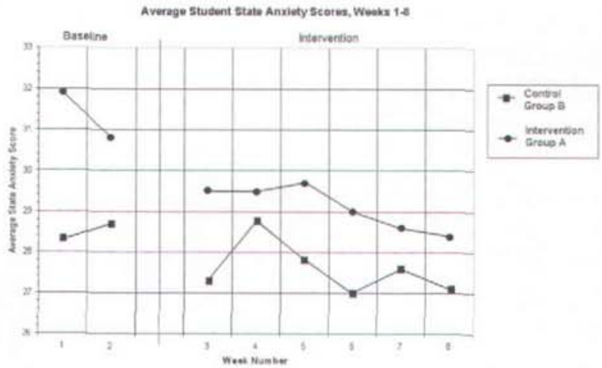


FIG. 22. Average state-anxiety scores for control (group B) and treatment (group A) conditions across 8 weeks. Higher anxiety scores indicate higher levels of anxiety. A between-subject treatment effect ($p = 0.059$) was seen in the state-anxiety between the treatment and control groups.

proaches, which typically require time-consuming individual practice or visits to practitioners. This paper demonstrates that SRT in consumer products such as the QLink Pendant, QLink Ally, and QLink ClearWave that are simply worn or placed in the local environment can protect against stress from a variety of types of stressors—including EM fields and possibly also chemical toxins—and help maintain a homeodynamic balance. As a result, performance, behavior, and dynamic stability are enhanced, as shown in numerous studies summarized here.

The comprehensive results of SRT mitigating the stress response in a wide variety of biologic systems and at various levels of system organization are provided in this paper. Studies on stressors impacting the various levels of biological organization, as shown in Table 1, from the molecular level to the behavioral level have been conducted. The biologic 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.

Indeed, there are limitations to these studies, as most of them are preliminary pilot studies, only small numbers of subjects were used, and they were of short duration. However, some of these studies are double-blinded, placebo-controlled studies—the gold standard of clinical research. All these studies except for one (Shealy et al., 1998) have not been previously published, because there was no unifying concept for understanding them until the biofield hypothesis was conceived (Rubik, 2002; see pp. 703–717). Additionally, some of the studies are weaker than others and would not stand well alone. Taken collectively, however, they reinforce each other and suggest more strongly that SRT mitigates stress responses in numerous biologic systems. Nonetheless, more well-designed basic and clinical research is needed to study this new technology for confirmation and extension of results.

Although the exact *modus operandi* by which SRT interacts with the organism is not yet fully understood, its very nature as a subtle field device prompts us to consider a field model of life rather than the conventional biochemical model in our attempts to explain it. The biofield hypothesis (Rubik, 2002; see pp. 703–717) is used to explain the action of SRT. In order to produce an enormous range of effects at multiple levels of organization in organisms as does SRT, it is hypothesized that SRT must work at a holistic level of the organism. The proposed rudimentary model is as follows. SRT interacts with the biofield, the complex, extremely weak EM field of the organism, and reinforces certain of its key frequencies through resonance, thereby stabilizing the biofield. This

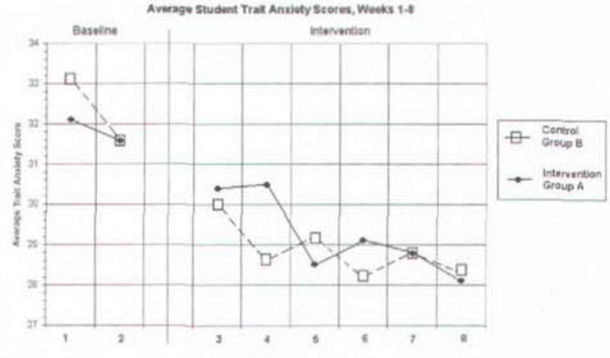


FIG. 23. Average trait-anxiety scores for control (group B) and treatment (group A) conditions across 8 weeks. Higher anxiety scores indicate higher levels of anxiety. No significant differences were found in trait-anxiety scores between the treatment and control groups.

is hypothesized to be a regulator of homeodynamic processes that govern the internal dynamics (physiology and biochemistry) of the organism. When under SRT, if the organism encounters stressors that would otherwise disrupt its biofield and challenge its homeodynamics, SRT stabilizes the biofield and the homeodynamic processes and thereby mitigates the stress response.

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Address reprint requests to:
Beverly Rubik, Ph.D.
Institute for Frontier Science
6114 LaSalle Avenue, PMB 605
Oakland, CA 94611-2802

E-mail: beverly.rubik@tui.edu